

Draft Safety Guide DS442 “Regulatory Control of Radioactive Discharges to the Environment”**Status: STEP 8 – Submission to the Member States for comments****TABLE OF RESOLUTIONS BY SECRETARIAT (to Comments to Draft 5 by member States by 20 July 2015)**

	COMMENTS BY STATE				RESOLUTION			
Relevance (where indicated by MS)	MS/Org	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
-	ENISS	General	DS 442 is closely connected with DS 432 and DS 427. 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.		X			
-	ENISS	General	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. The proposed detailed changes are the following (marked in red). (NOTE: see the resolutions for comments by ENISS in paragraphs 3.6, 5.5, 5.7, 5.9, 5.22, 5.46, 5.54, 5.56, 5.60, 5.66, 5.72, 5.85, I-16, I-44 below.		X			

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

-	UK	General Comment	SEPA welcome the report and believe that it should provide more consistency on the control of radioactive discharges to the environment		X			
			The document needs to be consistent in its consideration of shine from facilities and its need to be assessed when determining the dose to the public.		X	Paragraph was added in Section 5		
			It would be valuable if the report provided guidance on the use of limit of detection measurements in dose assessments, i.e. when the LoD should be considered as a true value or when 50 % or 0 % of that value can be used. We are aware of European guidance on this.				X	This level of detailed guidance is considered better for a TECDOC or Safety Report (that is planned).
			The document would be increased in value if the role and use of habits data is included throughout the report.				X	The comment is very general. Habit data is discussed within the document and, in more detail, in cited references (e.g. DS427)
			<p>GENERAL COMMENTS</p> <p>I consider that this draft document is not consistent with other IAEA Guidance.</p> <p>The document appears to take no account of RS-G-1.7 in applying the concepts of exemption, exclusion and clearance to the discharges of radioactive material.</p>		X	Text was modified. Exemption is extensively discussed in the document and RS-G-1.7 is cited as a refer-	X	The comment is noted, but is difficult to address without a specific recommendation from the reviewer.

			<p>In particular, the introduction could be interpreted as requiring all discharges to the environment to be covered by a license or authorisation, irrespective of how trivial the discharge, with a significant consequent impact on MOD.</p> <p>Although this is clarified later (notably section 4), there is a need to revise the introduction to better reflect its intent.</p> <p>These factors have made it difficult to provide comments on individual paragraphs because the incorrect concepts underpin the entire document</p>			<p>ence in a footnote.</p>	<p>X</p> <p>X</p>	<p>Graded approach concept is applied in the document and it is stated that simpler installations may not need license.</p> <p>The comment is noted, but is difficult to address without a specific recommendation from the reviewer. Exemption, and notification/registration versus license is discussed in the document in Section 4.</p>
-	Sweden	General	<p>The introduction should be rewritten to explain why a control of consequences of the normal releases is required. The need for control and optimization must be explained – not by arguments that it is required on why it is required.</p> <p>We present no alternative text at this stage.</p>	<p>Formulations like “to prevent or minimize releases” is not very helpful and the frequent use of “very low doses to the public” is not relevant in this context. It could be read as if the Agency is challenging the ALARA-principle or regards that the requirements do not take costs or societal aspects into account.</p>	X	<p>Text was modified. The comment is noted, but is difficult to address in more detail without a specific recommendation from the reviewer. ALARA is now explicitly mentioned (quoting BSS).</p>		

			There is missing an argumentation on the consequences for workers at nuclear facilities if, for instance, ventilation of tritium would stop.	This and other arguments must be introduced in the introduction (as well as costs and technical limitations) to explain why there will continue be releases.			X	The comment is noted, but is difficult to address without a specific recommendation from the reviewer. The consideration of workers protection within the procedure of optimisation is discussed in a new para. in the Introduction and in Section 5.
			Refer more to the Definitions on page 381-426 of GSR Part 3 which are an integral part of the standards. Some footnotes explain terms but it is difficult to see that this is always necessary and which strategy is used for including and not including a footnote.		X:	Text of Paragraph 1.4 modified, and footnote added to note that the definitions given in the BSS apply unless otherwise noted.		
-	Sweden	Page 1, Para 1.1	Change very low doses to doses	No need for value judgements at this stage. If very low doses and low doses should be used in the document the notions should be defined!	X:	Text modified.		
-	UK	Para 1.1 – line 5	containing small amounts of radioactive residues that will expose the public and the environment to low levels of radiation. Owing to the low activity concentrations and high volumes of gases and liquid involved, such releases would be in many cases technically difficult or extremely costly to avoid. Or delete “containing minor amounts of radioactive residues that can produce very low doses to	Need to avoid pre-judgements about avoidance. The whole background section currently implies that not much needs to be done to control discharges –this tone should not be set upfront.	X	Text revised as suggested.		

			the public”.					
-	UK	Para 1.1	We would note that Facilities are designed to minimise the impact of radioactive sources on the environment not minimise the release (in Bq) for example a different less radiotoxic radionuclide can be released in potentially greater quantities than a more radiotoxic radionuclide (e.g. H-3 rather than Pu.		X	Text modified		.
2	Germany	1.2	<p>“The requirements for optimization of radiation protection may give rise to the conclusion that, if reasonable efforts has <u>have</u> been done <u>made</u> to maintain those releases as low as <u>reasonably</u> achievable, considering social <u>societal</u> and economic factors (<u>ALARA</u>), the resulting doses are very low and below the applicable dose constraints. sSuch releases are deemed to be justified from the radiological protection perspective, considering the very low radiological significance and the high unjustified costs which may be involved.”</p>	<p>Consistency with the Safety Requirements GSR Part 3 concerning the ALARA principle; see e.g. Paras 1.15 and 1.22 of GSR Part 3.</p> <p>The present sentence construction is unnecessarily convoluted. In order to improve the readability and comprehensibility of the entire statement, we propose splitting into two separate sentences.</p>	X			
	USA	1.2	<p>“... as low as is reasonably achievable...”</p> <p>Suggest adding “is reasonably” to ALARA definition (as consistent with NRC regulations and guidance) throughout DS422 (also check other related IAEA documents).</p>	Completeness, accuracy, and consistency.	X	text modified		
-	UK	Para 1.2	Rewrite	The paragraph is 5 lines long and is a single sentence that repeats itself.	X.	Text modified		

			We note that further optimisation may not be justified on the basis of socio economic cost consideration.		X.	Text modified		
			Needs re-write or delete	Ditto and the RP principles covered in next para	X.	Text modified		
-	Sweden	Page 1, Para 1.2	Rewrite the paragraph as: <i>If reasonable efforts have been made to maintain the releases as low as reasonably achievable, considering social and economic factors, the resulting doses are low.</i> Delete the rest of the paragraph	The releases do not have to be justified if the full practice is justified.	X.	Text modified. The text relating to justification has not been deleted, as it introduces the RP principle of justification.		
	USA	1.3	”... issue an authorization to release...”	Suggest replacing “permit” with “authorization” as referred throughout DS422.	X			
-	UK	Para 1.3	At the beginning of the paragraph add “In most cases, discharges that result in low doses to the public may be managed through applying the concepts of exemption or out of scope. However, some doses may be at a higher level of significance.”	This is incorrect. It should include the concepts of “out of scope” and “exempt” as these are also options for discharges to the environment. Further, omitting these concepts is not proportionate and therefore undermines the concept of justification	X			
			Releases to the environment have limited capability to be controlled once they have occurred. Releases should be properly assessed to ensure no long term impact.		X			
-	UK	Para 1.3 and 1.4	1.3 In these cases it may be appropriate to	The deletion of the final part of para 1.4 is be-	X			

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

			<p>issue a permit to release these effluents to the environment, establishing stringent technical and regulatory conditions, including for the adequate management and control of these effluents and their radiological consequences, prior and after the releases may occur. The decision to permit such releases should take into account the radiological protection principles of justification, optimisation and limitation.</p> <p>1.4. Even though the doses received by the public due to the authorized releases of effluents are very low, they must meet the established dose limits and dose constraint. In accordance with principles and the requirements established in the IAEA safety standards [1, 2], these effluents are required to be properly managed by the licensees, in order to ensure the optimized protection of the public and the protection of the environment, without affecting the adequate level of protection of workers or imposing unnecessary burdens on the responsible organizations operating such facilities or conducting such activities.</p>	cause these things are implicit in “optimized protection”				
	UK	1.1 – 1.3	<p>1.1 Facilities and activities [1] that use radioactive sources, including nuclear reactors, are required to be designed, built, licensed, operated and maintained in a manner to prevent, or minimize the consequences of, radioactive releases to the environment, providing adequate levels of protection for the public and the environment.</p> <p>1.2 Some facilities and activities generate</p>	Current Draft (CD) para 1.1 would be better as 2 paras. CD Para 2 can be deleted and the ALARA principle covered in a reworded para 1.3.	X			

			<p>high volumes of gaseous and liquid effluents that contain minor amounts of radioactive residues that produce very low doses to the public. In many cases the prevention of release of these effluents would be technically difficult and/or extremely costly.</p> <p>1.3. In these cases it may be appropriate to issue a permit to release these effluents to the environment, establishing stringent technical and regulatory conditions, including for the adequate management and control of these effluents and their radiological consequences, to ensure that the resulting doses are below the applicable dose constraints and as low as is reasonably achievable, taking account of social and economic factors.</p>					
	UK	1.4	Comment Only	ONR agree with EA regarding the deletion of the final part of Current Draft para. 1.4 for the reason given in Comment Nr. 8 (Note: Comment Nr 8 is the comment from UK to para 1.3 and 1.4 above)	X			
-	Sweden	Page 1, Para 1.4, 1 st sentence	Suggest change the text to: <i>The estimated doses received by the public must meet the dose constraints or release limits established by the regulatory body.</i>	If they are low, very low or high is not the issue!	X	Text modified		
	Sweden	Page 1, Para 1.4	No reference is made to the coupling between waste management and releases which is of interest in this case.				X	The coupling between waste management and releases is mentioned now in the introduction and through Section 5, for instance when discussing optimi-

								zation.
	Switzer-land	1.6 / 2	According to the IAEA <u>Basic</u> Safety Standards ...	Editorial	X			
	Sweden	Page 2, Para 6 (Note:1.6)	This paragraph should come earlier and perhaps be merged with paragraph 1.1	This formulation is good and neutral –	X	Paragraph deleted (addressed in previous paragraphs which were modified).		
-	Japan	1.7/2 (p.2)	...the safety requirements established in GSR Part 3 [2] to the regulatory control of discharges [4] and...	Reference [4] (WS-G-2.3) doesn't seem to have a linkage with the context of paragraph 1.7.	X			
-	Turkey	1.7 Second Line	“The present Safety Guide supersedes the earlier Safety Guide ¹ . Footnote ¹ : INTERNATIONAL ATOMIC ENERGY AGENCY, Regulatory Control of Radioactive Discharges to the Environment, No WS-G-2.3, 2000”	Though it is not mentioned that this draft supersedes IAEA WS-G-2.3, and it is stated in para.1.7 that “This Safety Guide is concerned with the application of the safety requirements established in GSR Part 3 [2] to the regulatory control of discharges [4] and takes account of the advice given in a number of relevant Safety Guides [5-11] and experience from IAEA Member States.” (Reference [4] is WS-G-2.3) both documents’ titles are the same, it is understood that IAEA WS-G-2.3 is being updated taking IAEA GSR Part 3 into consideration.	X			
-	UK	Para 1.8 – line 2 and line 6	Include term “permit holder” as well as license, and “permit” as well as authorization				X	“Permit has been replaced “authori-zation”, as referred throughout DS422.
-	Canada	SCOPE	Add text indicating that the Safety Guide provides guidance on the establishment of discharge limits for facilities and activities for the protection of members of public and does not explicitly provide guidance on establishing discharge limits for the protection of the environment.	The GENERAL subsection of Section 3 describes how the Safety Guide is based on the optimization of the protection of the public. It is further stated that this approach assumes that the environment is protected as a result. The document needs to explicitly state that it deals			X	The OBJECTIVE section states that the safety guide addresses doses to the public. The assumption of the protection of the environment or the possibility to demonstrate pro-

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

				with discharges to the environment and its effects on the public and not with the environment as a receptor. This is best stated within the SCOPE.				tection using exposures to flora and fauna is discussed in a footnote in Section 3
-	Canada	Section 1 Para 1.10	This large topic can truly be left out of the scope, but it would still be useful to new regulators in particular to mention this in the ANNEX Section on OPTIMIZATION, e.g. with an extra paragraph, providing a reference to a useful generic discussion document for further reading.	<p>The Safety Guide explicitly states that delayed releases are not addressed in this Safety Guide. However, in the context of optimization, some guidance would be useful on the exact balance between routinely releasing contaminants during operations in an effluent stream for gradual dilution in the environment, versus sequestering contaminants in wastes and then managing / delaying those releases over a longer period of time.</p> <p>These are very practical issues, especially for uranium milling where strict regulatory limits on discharges to aquatic environments now result in the transfer of environmental issues to tailings management and the prediction of the long-term behavior of releases from tailings. Many similar tradeoffs occur in other contexts in the nuclear industry.</p>	X	References to guidance relative to waste management and mining have been added.		
	USA	1.10	“... (gases and particulates)...”	Suggest replace “aerosols” with “particulates” as more common term associated with radioactive effluents in	X			

				U.S.				
-	Japan	1.10/4 (p.3/2)	What is the intent of “injection of liquids containing radioactive material into underground water?” Is there any guidance in IAEA for injection of liquids containing radioactive material into underground water.	This is not a comment but just for clarification.	X	The para. was modified. “Injection” was deleted.		.
-	Australia	Paragraph 1.10	Add references: “Solid radioactive waste, post-disposal delayed releases, injection of liquids containing radioactive material into underground water, and releases to the environment arising from accidents are not addressed in this Safety Guide; relevant guidance is available in [ref’s]. ”	It would be useful to supply references to documents in which these issues are discussed, given their importance in the mining industry and in management of radioactive waste.	X			
-	Sweden	Page 2	Are the footnotes 2 and 3 on page 2 really needed – seems unessential?		X	Deleted		
-	Japan	1.12/5 (p.3)	A separate Safety Guide <u>provides recommendations and guidance on</u> considered the requirements for such prospective radiological impact assessments for both the public and the environment [8].	Amendment to make the description in line with the fact that Ref.[8] is a Safety Guide.	X			
	UK	Para 1.13	We note that the non- nuclear is significantly greater than the NORM industrial sector		X	Noted		
	Australia	Paragraph 1.13		Considering releases resulting from mining and milling of ores but excluding those mentioned in para 1.10 appears to be contradictory. It would help the reader if some reasons were given for excluding releases to	X	In 1.10, references have been added where guidance may be obtained on the practices that are listed as not being covered in this Safety Guide.		

				groundwater, etc., as these are very common in the mining and milling of ores and the management and ultimate disposal of the resulting wastes and residues.				
1	Germany	1.13	<p>“The facilities and activities considered cover a wide range of radioactive sources. For example, from those used in the general industry, in medicine and research to nuclear installations^[footnote] facilities like reactors, re-processing plants and others. This Safety Guide also covers the releases which may result from mining and milling of ores for the extraction of uranium or thorium as part of the nuclear fuel cycle. Consideration is also given to the releases of naturally occurring radioactive substances in non-nuclear or non-radiation-related industries.”</p> <p>Please assign a new footnote to the term ‘nuclear installations’ with the following text: ^{“[footnote]} The term ‘nuclear installation’ includes: nuclear power plants; research reactors (including subcritical and critical assemblies) and any adjoining radioisotope production facilities; spent fuel storage facilities; facilities for the enrichment of uranium; nuclear fuel fabrication facilities; conversion facilities; facilities for the reprocessing of spent fuel; facilities for the predisposal management of radioactive waste arising from nuclear fuel cycle facilities; and nuclear fuel</p>	<p>This is an indispensable information which needs to be included in the subsection “Scope”.</p> <p>A complete list of nuclear installations should take into account the revised definition of the term ‘nuclear installations’ which has been endorsed at the 32nd CSS meeting in October 2012. According to that definition, ‘nuclear installation’ means <i>“any nuclear facility subject to authorization that is part of the nuclear fuel cycle, except facilities for the mining or processing of uranium ores or thorium ores and radioactive waste disposal facilities”</i>.</p> <p>According to the IAEA Safety Glossary (2007 Edition), the term ‘nuclear</p>	X			

			cycle related research and development facilities.”	facility’ includes, by definition, facilities for the mining or processing of uranium ores or thorium ores. Consequently, when using the term ‘nuclear facility’, the 3 rd sentence in Para 1.13 <i>“This Safety Guide also covers the releases which may result from mining and milling of ores for the extraction of uranium or thorium as part of the nuclear fuel cycle.”</i> would be superfluous and could be deleted.			X	The sentence is required because, per the Glossary, a ‘nuclear facility’ contains ‘nuclear material’ and the definition of ‘nuclear material’ excludes ores and ore residues.
-	Japan	1.13/4,5 (p.3)	Term ”discharges” seems appropriate rather than “releases”.	Wording. We recognize that this Safety Guide covers “discharge”, not “release”. It will be highly appreciated if IAEA could provide the reason why the term “release” is used in mining and milling of ores for the extraction of uranium or thorium and naturally occurring radioactive substances.			X	The term ‘releases’ is used quite generally throughout the report (for example in Section 1.1), and is not limited to releases from the mining and milling of ores. ‘Discharge’ is used to refer to authorized releases (See Section 1.5).
-	Japan	1.13/6 (p.3)	...naturally occurring radioactive substances ^X in non-nuclear or non-radiation-related industries. Footnote X: This is the ‘scientific’ meaning of radioactive (1), and should not be confused with the ‘regulatory’ meaning of radioactive (2): ‘Designated in national law or by a regulatory body as being subject to regulatory control because of its radioactivity.’ The ‘scientific’ meaning of radioactive refers only to the	It is informative for the readers those who are not native speakers of English, to have a footnote of the definition of “radioactive substances” from page 412 of GSR Part3, because the term “radioactive material”	X	Footnote added in Section 1.1.		

			<u>presence of radioactivity, and gives no indication of the magnitude of the hazard involved.</u>	is usually used in the Safety Standards.				
	China	Page 3 Para 1.13 Line 1-3	Revising to be “For example, from those used in the general industry, in medicine and research to nuclear facilities like reactors, re-processing plant, <u>radioactive waste management</u> and others.	In regulatory control of radioactive discharges to the environment, radioactive waste management plant shall be seemed as a type of important facility and mentioned in this sentence.	X	Text revised to include the definition of ‘nuclear installations’, which includes waste management facilities.		
3	Germany	1.14	Penultimate sentence: “Finally, Section 8 discusses how to consider previously unregulated practices.”	Grammar.	X			
-	Japan	1.14/10 (p.4/8)	...the conditions in the authorization, <u>demonstration of</u> the compliance and the involvement	Clarifying by adding the word to make the description consistent with the title of sub-section in p.33.	X			
	Turkey	1.7 Second Line	“The present Safety Guide supersedes the earlier Safety Guide ¹ . Footnote ¹ : INTERNATIONAL ATOMIC ENERGY AGENCY, Regulatory Control of Radioactive Discharges to the Environment, No WS-G-2.3, 2000”		X			
-	Japan	Title of Section 2 (p.4)	THE <u>RADIATION PROTECTION</u> PRINCIPLES FOR CONTROL OF DISCHARGES	Adding words for the clarification.	X			
3	Germany	Section 2	Note: Wrong numbering of paragraphs in Section 2, subsections “OPTIMIZATION” and “DOSE LIMITATION”. Renumbering of paragraphs is required: 3.1 → 2.4; 3.2 → 2.5; 3.3 → 2.6	Editorial.	X			
-	Australia	Section 2		The paragraph numbering scheme needs fixing (3.1 – 3.3).	X			

-	Czech Rep.	2.2		It is questionable, how to apply this principle. It is usually a political decision. Better expression of the principle is in DS432 para 2.12.	X	Text in line with DS432 added.		
-	Canada	2.2/3	“...should outweigh the <i>potential</i> for harm, including the radiation detriment”.	As radiation protection at low doses is related to “potential” harm associated with stochastic effects the sentence could be clarified as indicated.	X			
-	Sweden	Page 6-11	Section 3 is a summary of the requirements of GSR Part 3 (Part 1, Part 5 on 5 pages – we have not checked these.		X			
-	Switzerland	3.1 (<i>should be 2.4!</i>) – <i>same for following Paras</i>	The principle of optimization of protection and safety, which is defined as <u>the</u> process of determining <u>the</u> level of protection and safety <u>required to keep</u> the magnitude of individual doses, the number of individuals (workers and members of the public) subject to exposure and the likelihood of exposure <i>being</i> “as low as reasonably achievable, economic and social factors being taken into account”, should be applied when setting discharge limits.	Rephrasing to improve understanding. The proposed text is also better in line with the definition of “Optimization of protection” by the ICRP. Cp. also similar comment to DS432	X			
		3.1 / 3	The fundamental safety objective is to protect people and the environment from	This is a nearly literally repetition of the state-	X			

			harmful effects of ionizing radiation.	ment in the sentence just above.				
-	Switzerland	3.3 / 3	It includes requirements <u>relevant to the involved</u> parties (...) for the control of discharges.	Rearrangement to improve understanding	X			
-	UK	Para 3.3 – line 9	Add “except medical and natural sources” after “sources of radiation”	Dose limit does not apply to all sources	X	Alternative provided in the next comment was used.		
		Para 3.3 – lines 9-10	Replace: “in planned exposures situations and include all the sources of radiation” With: “from all radiation sources in planned exposures situations”	Alternative way of addressing point made by EA in Comment Nr. 13 (Note: Comment Nr 13 refers to comment from UK above).	X			
		Para 3.3a	We have assumed that the reference is to committed effective dose		X	Noted		
		Para 3.3b	We note that this should be averaged over 1cm2 to a depth of 70 micron		X	Noted		
2	Germany	Footnote No. 6 to 3.3 in Section 2	“For example, in authorized, <u>justified and planned</u> operational conditions that leads to transitory increases of <u>in</u> exposures.”	Amendment/correction to be in line with the wording used in GSR Part 3 (Footnote No. 68 to III.3).	X			
	Switzerland	3.5 / 2	... on considerations of <u>the radiological protection of people</u> ...	Editorial	X			
	UK	Para 3.5	The system of protection and safety required by the IAEA Safety Standards, which is was founded primarily on considerations of people the radiological protection of humans, generally it now also aims to provide for appropriate protection of the environment against the harmful effects of radiation	This statement is outdated – it should be amended to reflect the accepted principle that the environment needs protection in its own right. – see next comment	X	Proposed text was accepted but modified		
	Canada	Section 3	Revise para 3.5 to include some of the specific	This philosophical statement	X	Paragraph 3.6 modified		

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

		Para 3.5	language from reference [2] dealing with the IAEA philosophy for environmental protection, so that the very restricted objectives of the BSS are more clearly specified in this preamble. An electronic search for the word “appropriate” is also justified. In many cases there is no added value in sentences with the simple inclusion of this word or a qualifying phrase such as “if appropriate”.	is too brief, e.g. in terms of the use of the word “appropriate” for environmental protection. The level of environmental protection defined in the BSS is limited to a very narrow focus related to people; this should be more transparent with a bit more text justifying this very restricted interpretation.	X	to include text from the BSS regarding environmental impact assessments. The use of ‘appropriate’ was revised in some places and will be further revised in the final editorial revision.		
-	ENISS	3.6	The establishment of discharge limits for facilities and activities, as described in this Safety Guide, is based <u>primarily directed to</u> on the optimization of the protection of members of the public (e.g. the endpoints of the assessment to specify discharge limits is dose to the representative person) <u>taking into account workers protection within the emitting facility appropriately.</u>	There is a trade-off between workers’ dose and doses of members of the public. This is addressed within the text of the draft e. g. in 3.1 or 5.58. To focus on protection of the public only would not be appropriate.	X			
3	Germany	3.6	“... optimization of the protection of members of the public (e.g. the endpoints of the assessment to specify discharge limits is <u>the effective</u> dose to the representative person). This approach assumes that the environment is protected by means of the conditions resulting in the authorization for the practice.”	Wording/Editorial.	X			
-	Switzerland	3.6, footnote 8	Some States may consider that, in addition to the optimization of the protection of the public and the assumption that in doing that the environment result <u>is</u> also	Editorial	X			

		Line 5	protected, because human exposure due to radioactive substances <u>in</u> the environment is the more restrictive factor, <u>however, estimations of the</u> exposures to flora and fauna can be done in the framework of environmental impact assessments.					
-	UK	Para 3.6	[this para should be amended to reflect that although the primary focus is on humans there should be recognition that assessments need to be done to demonstrate that the environment is also protected. For example see footnote 8 which should be brought into the main text and emphasized that such assessments should be done by all MS]	Would bring more into line with GSR part 3 which is more explicit about radiological environment impact assessment.	X	Paragraph 3.6 modified to include text from the BSS regarding environmental impact assessments.		
-	Canada	3.6 footnote 8	Modify text to footnote 8 as follows: “Some States may consider that, in addition to the optimization of the protection of the public and the assumption that in doing that the environment result also <u>is</u> protected, there may be a need to assess <u>and verify</u> more explicitly the protection of the environment, including, for instance, estimations of radiation exposure of populations of flora and fauna....”	As stated in footnote 8, exposures to flora and fauna can be done in the framework of environmental impact assessments (EIS). Environmental risk assessments, which are reviewed on a periodic basis, can serve to verify original predictions of exposure to environmental receptors from the EIS.	X			
3	Germany	3.7	“Paragraph 2.8 of GSR Part 3 [2] states: ...”	Grammar.	X			
-	Canada	Section 3 Para 3.14 (b)	Revise language throughout the document where effluent treatment technologies / practices etc. are mentioned to specifically use the term “best available techniques” so that pollution prevention objectives are consistent in any general guidance provided.	Here and in many other paragraphs throughout the document the term “good practices” is used. Expectations for pollution prevention are more explicitly defined in the ANNEX on			X	“Good practice” is the term used in the BSS. For example, Paragraph 3.14(b) is a direct quote from the BSS.

				pg 53 as “best available techniques”. This is a far better definition with practical implications. Careful consideration should be given to using this type of explicit language whenever effluent control objectives are discussed in the document.				“Good practice” is a more general term than ‘best available techniques’, however “best available techniques” is appropriately used in the context of the practical considerations provided in the Annex.
-	Australia	Paragraph 3.14		<p>The quotation marks need attention (e.g. quotation finishes at end of (a) and also end of (d), but nothing in-between.</p> <p>Are future demographic changes covered (3.14(a))? (guidance is required)</p>	X		X	Demographic changes are considered when discussing changes in the representative person, for instance, due to habit data or location changes, in Section 5
	Canada	Section 3.15	Add a paragraph with appropriate language to include the concept of verifying / updating risk predictions on a periodic basis through formal submission of documentation to the regulatory body.	Although discussed in a generic sense elsewhere in terms of verifying predictions, this critical section would benefit from specific mention in the “shall” context of the need to submit periodic updates to the regu-			X	This is addressed in Paragraph 3.19.

				latory body (based on operational data and analysis) to verify that human health and environmental impacts remain as predicted in the initial authorization / risk assessment.				
-	Australia	Paragraph 3.15		<p>Guidance is required on predicting future changes in behavior patterns and the impact on choice of exposure pathways (3.15(b)), and for prospective studies, the possibility that the representative person may change with time (3.15(c)).</p> <p>Note that it may be necessary to update prospective assessments when new information becomes available, and the importance of communicating this to all stakeholders at the start of the assessment process and as the process develops.</p>			X	This is addressed in Paragraph 3.19.

	Turkey	3.15/ between (b) and (c)	“Shall identify representative person “ is proposed to be written	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 as stated in para. 5.28 of DS427.			X	The text is a quote from the BSS, and cannot be modi- fied.
3	Germany	Headline prior to 3.17	“DOSE LIMITS <u>LIMITATION</u> ”	For the sake of consisten- cy, the same headlines as in Section 2 should be used for equivalent sub- sections.	X			
	Canada	3.19	No change.	Changes in the environmen- tal transfer parameters and/or dosimetric factors could affect radiological impact assessment and re- sults due to the discharges. Realize that text is quoting GSR Part 3, hence it is not possible to change wording. However, for future consid- eration in GSR updates it is suggested that the green text be considered ... “regis- trants and licensees shall review and modify their discharge control measures” taking into account: “operat- ing experience” and “ scien- tific advance or improve- ment in the assessment of radionuclides’ behaviour methodology and/or dosi- metric calculations ”, and “any changes in exposure pathways or in the character- istics of the representative	X	Noted		

				person that could affect the assessment of doses due to the discharges ”				
	Turkey	3.19/last line	“Within periodic review and changes in characteristics of the source shall also be taken into account”	After licensing, characteristic of the source may change and discharge control measures may be modified accordingly, this should be inserted to the para.	X	Text modified		
3	Germany	Headline prior to 3.20	“SOURCE AND ENVIRONMENTAL MONITORING”	Grammar.	X			
	Turkey	3.20/fourth line	„The programmes shall be sufficient to verify compliance with the requirements for the control of public and workers exposures“	Source monitoring is performed for control of not only public exposure but also workers exposure. Hence the proposal was made.			X	The text is referring to the requirements of the BSS. It is not possible to add additional requirements in a guidance document (Safety Guide).
-	Sweden	Page 11-12	Consider moving the text of footnote 12 into the paragraph 4.1. There is a spelling mistake in the second sentence of footnote 11 (Information → Information)	Good section with reasonable advice.			X	The comment has been reviewed, and it is considered that it is best to keep the text as a footnote. The typographical error in footnote 11 has been corrected.
3	Germany	4.1	“... practices where the radiological impact to the public is deemed to be not amenable to control, e.g. when dealing with radiation	Editorial (replace opening bracket by comma as there is no closing bracket	X	Sentence modified.		

			sources which are excluded from the IAEA safety standards as stated in [2]; ...”	in this paragraph).				
	Australia	Paragraph 4.1	There is a “close bracket)” missing.	Can a situation where the radiological impact to the public is not amenable to control be regarded as a practice? It is certainly not a planned exposure situation. This needs clarification.		Sentence modified.		
3	Germany	Footnote No. 11 to 4.1	2 nd sentence: “ I nformation is also provided on levels ...”	Editorial.	X			
-	Switzerland	4.2 / 2	... should be justified and, then <u>subsequently</u> , whether the practice ...	Editorial	X			
-	Australia	Paragraph 4.2 and Figure 1		Why would a practice need to be justified if it is excluded (or maybe even exempted) from regulatory control?			X	Justification is applied to the overall practice, rather than just the potential impact of any releases that may be associated with the overall practice. Once it has been determined that the overall process is justified, it is then necessary to determine whether or not an authorization for the releases is required.
-	UK	Para 4.3	Delete bit about low probability scenario	Question use of low probability scenario here. We are looking at planned			X	The text in Paragraph 4.3 related to ‘Exemption’ is

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

				exposure situations which take into account reasonably foreseeable scenarios. Also a dose constraint for a single facility would be less than 1 mSv/y.				taken from the BSS, and the discussion of low probability scenarios cannot be deleted because of the content (Schedule I of the BSS).
1	Germany	4.3	<p>2nd sentence: Please assign a new footnote to the term ‘low probability scenarios’ with the following text: “^[footnote] <u>The individual dose criterion for low probability scenarios is based on the assumption that the probability of occurrence does not exceed 10⁻² per year [28].</u>”</p> <p>The following publication of the European Commission should be added to the list of references: “<u>[28] EUROPEAN COMMISSION, Principles and Methods for Establishing Concentrations and Quantities (Exemption Values) Below which Reporting is not required in the European Directive, Radiation Protection 65, Doc. XI-028/93, EC, Brussels (1993).</u>”</p>	<p>Essential background information to be included. The term ‘low probability scenarios’ is used in Para 4.3 but is not defined in the IAEA Safety Glossary (2007 Edition). Appendix C “Basic assumptions for dose and risk criteria” of Ref. [28] does address the risk criteria for low probability scenarios and should be referred to for completeness; see https://ec.europa.eu/energy/sites/ener/files/documents/065.pdf</p>	X	Text modified and reference added.		
	Czech Rap.	4.2 – Fig.1	Drop the figure.	The diagram is neither clear nor correct, there are more possibilities. Better is to include information directly in the text. If the practice is not excluded or exempted, it does not necessarily put any condition on authorization of its discharges.			X	The comment has been reviewed, but it is considered that the figure is important to demonstrate that Justification is applied to the overall practice, rather than just the potential impact of any releases that may be associated

								with the overall practice. Once it has been determined that the overall process is justified, it is then necessary to determine whether or not an authorization for the releases is required.
-	UK	Para 4.4 – line 2	<p>the regulatory body and/or government should provide the conditions</p> <p>Examples of candidates for exemption are discharges from research laboratories using small quantities of radionuclides in tracer studies or in radioimmunoassay techniques and hospitals using xenon test kits.</p>	<p>Not regulatory body in some countries</p> <p>May be better not to give specific examples here because it may vary significantly?</p>	X			
	Switzerland	4.4 / 8	... no discharge authorization <u>is necessary</u> ...	Editorial	X			
	Switzerland	4.5 / 6	... should consider developing clear criteria <u>based e.g. on the radionuclides involved or</u> the maximum activities ...	Editorial	X			
	Australia	Paragraph 4.5	Suggest addition of text to end of para: “Consideration should be given to any possibility of bio-accumulation or contamination of groundwater.”	Checking discharge levels may not be appropriate if bio-accumulation can occur, or ground water could become contaminated.			X	This comment has been reviewed, and it is considered that bio-accumulation and groundwater contamination are included in the dose assessment and determination

								of exposure pathways (Paragraphs 3.14 and 3.15).
	Switzerland	5.1 / 2	...by which a regulatory body or <u>another</u> governmental body grants written permission to <u>conduct specified activities</u> . <u>For example, an authorization may be required at different stages of the lifetime of a facility.</u>	Rephrasing to improve understanding	X	Text modified.		
	Sweden	Page 13, Para 5.1	The formulation here is a bit elaborated on as compared to the definition in GSR Part 3	The part ‘at different stages of the lifetime of a facility’ is not stated in GSR Part 3	X			
1	Germany	5.5	“For complex facilities, like nuclear facilities <u>installations</u> , there may be multiple stages for the full authorization process which are associated with different phases of the lifetime of the facility: from siting and site evaluation to decommissioning, and release from regulatory control. Figure 2 (adapted from Ref. [18] <u>[5]</u>) describes schematically the stages in the lifetime of a complex facility, like a nuclear installation, and the timing when the control of discharges should be considered. <u>The vertical arrows in full indicate the stages at which the control of discharges may be discussed with the regulatory body and, prior to operation, when authorized discharge limits are set. The vertical dashed lines indicate where the authorized discharge limits may be reviewed and updated by the regulatory body, if necessary. The horizontal arrow indicates the evolution of time.</u> ”	1 st sentence: Wording adapted to be in line with the terminology used in the 2 nd sentence (“... <i>the stages in the lifetime of a complex facility, like a nuclear installation, ...</i> ”). 2 nd sentence: In the list of references, SSG-12 inadvertently occurs twice: Ref. [5] and Ref. [18]. Delete [18] in the text and replace it by [5]. 3 rd to 5 th sentence: Clarification and completion regarding Figure 2. The proposed explanation is adapted from Para 4.7	X	Figure was updated		

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

				of the Draft Safety Guide DS427 (latest version 6 dated March 2015).				
-	ENISS	5.5	<u>Add: The vertical arrows in full indicate the stage at which the assessment may be discussed with the regulatory body and, finally, previous to operation, when the final assessment is ready, submitted for approval. The vertical dashed lines indicate where a reviewed assessment may be submitted to the regulatory body if significant changes have occurred during the operational stage. The horizontal arrow indicates the evolution of time.</u>	For clarification. Text taken from DS 427, 4.7.	X			
	UK	Para 5.5 and Fig 2	Add to end of 5.5: “In some cases/countries facility designers (e.g. reactor suppliers) may request that regulatory bodies consider optimization of discharges from a generic design prior to specific sites being identified. This would help make a subsequent site-specific authorization process more efficient, especially if the design is to be implemented across a number of sites.”	in England and Wales the regulators carry out a generic design assessment (GDA) process which considers optimization from a generic non site-specific perspective and may therefore precede any siting aspects. For this to happen facility designers (e.g. reactor suppliers) would need to be apply to the regulatory body or governmental body	X			
	Canada	5.5, 5.70, 5.72	Revise these paragraphs and remainder of document to ensure consistent use of the term “complex facilities”.	There is an inconsistency throughout the document with regard to the term “complex facilities” In some cases complex facilities are described as nuclear power plants, reprocessing facilities (see para 5.72), however, at other times “complex facilities” are simply described as	X			

				“nuclear facilities” with no consideration of actual size and complexity of the nuclear facility. The document needs a careful edit to ensure that a graded approach is applied and recognizes that not all nuclear facilities are necessarily large and complex operations.				
	UK	Para 5.6 – line 5 Line 7	impact to on workers. In some circumstances a provisional discharge authorization could be issued before construction starts.	Editorial In UK we have permitted ahead of construction in some cases	X			
-	Australia	Paragraph 5.6		Excluding releases to ground water from consideration may not be appropriate when assessing the impact of facilities handling very long-lived radionuclides			X	The scope of this Safety Guide is normal operations/planned exposure situations, so it would not be appropriate to include releases to ground water in the authorization of discharges process. Migration to ground water is a different thing to a controlled discharge.
3	Germany	5.7	3 rd and 4 th sentence: “Because the aim of the radiological environmental impact assessment is to obtain a comprehensive anticipated view of the risk to <u>the public</u> of <u>and</u> the environment represented by the facility or activity, radiological environmental impact assessments include more aspects that <u>than</u> the impact to members of the public during normal operations, which	3 rd sentence: Editorial. 4 th sentence: Clarification. The potential exposures to members of the public are the outcome of the prospective assessment, not the input.	X			

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

			are the basis for establishing discharge limits. For example, they also include the consideration of potential exposures due to the conceivable accidents resulting in from safety assessment studies.”					
-	ENISS	5.7	...Because the aim of the radiological environmental impact assessment is to obtain a comprehensive anticipated view of the risk to public of and the environment represented by the facility or activity, radiological environmental impact assessments include more aspects that the impact to members of the public during normal operations, which are the basis for establishing discharge limits.	Editorial	X			
	UK	Para 5.7 line 5	Because the aim of the radiological environmental impact assessment is to obtain a comprehensive anticipated view of the risk to public of and the environment represented by the facility or activity, radiological environmental impact assessments include more aspects that than the impact to members of the public during normal operations, which are the basis for establishing discharge limits. For example, they also include the consideration of potential exposures due to the conceivable accidents resulting in safety assessment studies. The results of such prospective assessment should be compared to relevant criteria and this will give the first indication of the acceptability of the facility or activity under consideration and provide useful information to be considered during the optimization of the protection of public and subsequent process of setting discharge limits.	Question the need for highlighted bit since it deals with accidents which the scope stated earlier does not include?			X	This comment has been reviewed, and it is considered important to note to the reader that an EIA or an REIA (as discussed in DS427) may contain information that is not of direct relevance to the establishment of discharge limits for normal operations.
		Para 5.7	Comment	Para 5.7 references DS427 on Radiological	X	Noted		

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

				Environmental Impact Assessment which does include conceivable accidents within its scope. This may justify the inclusion of the last two sentences of the current draft para.				
	Switzerland	5.7 / 5 – 15	Because the aim of the radiological environmental impact assessment ... during the optimization of the protection of the public and subsequent the process of setting discharge limits.	The entire text mentioned introduces more confusion than it adds for clarity. Therefore it should be reworked or deleted.			X	This comment has been reviewed, and it is considered important to note to the reader that an EIA or an REIA may contain information that is not of direct relevance to the establishment of discharge limits for normal operations.
	UK	Para 5.8	5.8. At a later state, for instance in the commissioning stage, further detailed information should be provided to the regulatory body so that it is sufficient to make judgements to set a full discharge authorization at the end of the commissioning stage. Sufficient information should be provided to the regulatory body to enable it to issue a full discharge authorization before the start of operation. The procedure to develop a discharge authorization, including the information that should be required by the regulatory body to the applicant is described in the following Section, paragraphs 5.x to 5.y (Note: exact paragraphs to be indicated at the end of edition).	Note in UK authorizations (permits) can be issued ahead of construction and commissioning	X			
			At a later state, for instance at the construc-	An authorisation should	X	Text revised.		

			tion or inactive commissioning stage, further detailed information should be provided to the regulatory body so that it is sufficient to make judgments to set a full discharge authorisation prior to the active commissioning stage.	be in place prior to any radioactive discharge, this includes those arising from the active commissioning stage. The authorisation may, if necessary, be varied when progressing to full operation.				
3	Germany	5.8	2 nd sentence: “The procedure to develop a discharge authorization, including the information that should be required by the regulatory body to the applicant, is described in the following Section , paragraphs 5.15 to 5.19 5.x to 5.y (Note: exact paragraphs to be indicated at the end of edition).”	This is where to find the relevant information in the current draft version. The phrase “in the following Section” could be misleading as it suggests that Section 6 is referred to.	X			
-	Switzerland	5.8 / 2	... to the regulatory body so that it is sufficient to make judgements ...	Editorial	X	Text revised.		
-	ENISS	5.9	During the operation phase the discharge authorization should be reviewed, as part of the periodic safety review	A review is only necessary if significant changes occur. This is addressed in the remaining text of this para.	X	Text revised.		
-	UK	Para 5.9	5.9. During the operation phase the discharge authorization should be reviewed, for example as part of the periodic safety review [2].	In UK it is not normally part of the PSR done by the safety regulator but done more frequently by the environmental regulator.	X			
	Sweden	Page 15, Para 5.9	Consider also including change of dose models and conversion factors.	Some countries have the discharge limits formulated as dose constraints and then changes in dose models and ICRP risk estimates are	X			

				reasons for revision.				
-	UK	Para 5.10	5.10. A new or varied discharge authorization should may be required when operation concludes to take account of the likely changes to the discharges during the de-commissioning process.	In UK we have a more flexible approach to deciding what needs to happen to the permit when operations cease.	X	Text revised.		
	USA	Figure 2 Para 5.10	Change Figure to say decommissioning discharge	The Figure gives the impression that the only discharge authorization is pre-decommissioning. However the text in para 5.10 is more clear that there needs to be a review and separate authorization for discharges during decommissioning. Change in figure suggested to align with text.	X	Figure was updated		
	UK	Para 5.11	5.11. The release of a facility from regulatory control will depend in part upon whether a discharge authorisation is still needed.	Didn't make sense (if it is released from control then an authorization by definition is not required)	X			
	Switzerland	5.11 / 2 5.11 / 7	... normally <u>usually</u> the resulting exposure should specify the control <u>and measures necessary</u> after decommissioning on the measures to prevent ...	Editorial	X X	Text revised.		
	Australia	Paragraph 5.11	Punctuation needed: "...required. However, some ..."	Uranium mining and milling facilities are not the only facilities that	X	Text revised.		

				can lead to residual releases after decommissioning and closure.				
-	UK	Para 5.12	5.12. A graded approach should be applied to all stages of the authorization process. Authorization can be by means of registration or licensing/ permitting .	Note that in some countries such as UK licensing relates principally to nuclear safety licensing and not to control of discharges.			X	‘Permitting’ is not BSS terminology. BSS uses license/authorise and not permit. The idea of giving a “permit” is however implicit in the discussions within the document
-	Switzerland	5.12 / 2	<u>An</u> authorization can be <u>granted by</u> registration or licensing.	Editorial	X			
3	Germany	5.13	1 st sentence: “Authorization <u>th</u> rough registration should be used where: ...” Last sentence: “The regulatory body should specify the practices which may be authorized <u>th</u> rough registration.”	Editorial. Editorial.	X X			
-	Switzerland	5.13, lit. d	<u>Based on experience, there are</u> few problems ...	Editorial	X			
-	UK	Para 5.13	5.13. Authorization trough through	misspelling	X			
		Para 5.13 – last line	authorized trough through registration.		X			
	Australia	Paragraph 5.13	Replace “trough” by “through”.		X			

	USA	5.13	Change trough to through	Editorial correction.	X			
	Turkey	5.13/first line	„trough should be corrected as „through“	Grammar correction	X			
	Turkey	5.13	Some example may be given for type of facilities and activities which shall be authorized via registration	There is no any example given for registration IAEA GSR Part 3, either. Examples are good for explaining clearly and supplementing the ideas.	X			
-	Switzerland	5.14 / 1	Licensing should then be applied in all other cases, with the stringency of the conditions <u>adapted</u> to the level of risk.	Editorial	X	Text revised.		
-	UK	Para 5.14	5.14. Licensing should then be applied in all other cases, with the stringency of the conditions graded according to <u>the level of risk.</u>	It may be better in the context of this document to refer to the level of dose rather than risk given that the document is addressing doses that are assumed to be certain to occur.	X	Text revised.		
	Switzerland	5.15 / 7	... activities, <u>whereby</u> radionuclides <u>may be released</u> to the environment.	Editorial			X	This comment has been reviewed, and it is considered that the existing text is appropriate.
2	Germany	5.15	Penultimate sentence: “The special characteristics to be considered regarding discharges of naturally occurring radionuclides from non-nuclear industries are discussed in Section <u>6 8</u> below.”	Wrong section is referred to in this paragraph. Discharges of NORM are dealt with in Section 6.	X			
3	Germany	5.15	Last sentence: “Additional explanation of the authorization process for nuclear installations <u>s</u> may be found in Ref. [5] and [8].”	Editorial.	X			
	UK	Para	5.15. A graded approach	Query – is this defined			X	“Graded ap-

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

		5.15		somewhere? I.e. defined as a proportionate approach?				proach” is defined in the BSS.
	UK	Para 5.16 line 2	The decision on the need for a discharge authorization was is discussed before in Section 4.		X			
-	UK	Para 5.17 line 1	5.17. Once the need of a discharge authorization was is confirmed,	Tense?	X			
		Para 5.17 Section (d)	Any assessment to determine the representative person must initially consider a range of potential candidates and be sensitive to any potential changes in the behaviour of the radionuclides considered as the representative person may change over time and the nature of the release.		X	Noted. The possibility of changes over time is addressed in Paragraph 3.19.		
		Para 5.17 Section (e)	The applicant should submit the results of the assessment to the regulatory body. The regulatory body should evaluate if the models and assumptions used by the applicant are valid and if the resulting doses provides optimized protection of the public and the environment .	To keep consistent with messaging elsewhere in the document. An optimized approach to environmental protection is now being recommended by ICRP 124 - in addition to a limitation approach.			X	This comment has been reviewed, and it is considered that the existing text is appropriate. The subject of environmental protection is discussed further in paragraph 3.6.
	Czech Rep.	5.17 (c)	The applicant should carry out the optimization of protection of the public, considering measures to be used to minimize the discharges keep the discharges ALARA with taking into account all relevant factors.	The strong requirement “minimize” should be moderated.	X			

	Switzerland	5.17, lit. f	... and any arrangements <u>to show their compliance</u> ...	Editorial	X	Text revised.		
3	Germany	5.17 (f)	“... compliance during operation, including source and environmental <u>al</u> monitoring systems and programmes.”	Grammar.	X			
	UK	Para 5.17 – footnote 13	The use of ‘best available techniques’ is discussed below and is considered in the Annex as an alternative a way of applying optimization	BAT is a manifestation of the optimisation principle. See extract from EA guidance below: Operators, when disposing of radioactive waste, need to ensure that the radiological impacts on people are kept as low as reasonably achievable, taking into account economic and social factors. This is the optimisation requirement. We expect operators to achieve this through the use of “best available techniques” (BAT) in the relation to the management of the generation and disposal of radioactive waste.	X			
-	Australia	Figure 3	Suggest change “below optimized levels” to “ <u>below the defined constraints</u> ”.	Should doses be shown to be “below optimized levels” or “below the defined constraints”? A regulatory authority should have discretion	X			

				to allow discharges that exceed defined constraints but have been demonstrated to be optimized according to ALARA in situations where a clear net benefit can be demonstrated. The figure needs to reflect this.				
	Canada	5.17 Fig. 3	Figure 3 does not capture all steps described in para 5.17.	“Evaluation of assessment results” in (e) and “verify compliance” in (f) are not explicitly included in the diagram.	X	Figure was updated		
	UK	Para 5.18 line 5	Ref. [8] discusses the factor factors to be considered when deciding the level of complexity of the assessment of the protection of the public for facilities end activities.		X			
	Switzerland	5.19 / 4 5.19 / 8	... and the implications on the <u>operation of the</u> plant which could be <u>induced</u> by the discharge limits and conditions; This should be conducted in an iterative manner in order to reach an <u>acceptable</u> optimum solution <u>from the point of view of the radiation protection</u> .	Editorial rearrangement to improve the clarity	X			
	UK	Para 5.19	5.19. The process illustrated in Figure 3 identifies actions by the regulatory body and by the applicants. It is important to remark that, when In setting the authorized discharge limits for a facility or activity there should be regular engagement between the applicant and the regulatory bodies to a strong	Required some clarification and simplification.	X	Text revised.		

			interaction to discuss the validity and assumptions used to estimate doses, the optimization process and the implications on for the plant's operational conditions which could be influenced by the discharge limits and conditions; For example, the liquid and gaseous waste fluxes and any storage implications and the associated doses to the workers should be considered. This should be conducted in an iterative manner in order to reach an agreeable optimum solution from the overall radiation protection point of view.					
3	Germany	Fig. 3 (p. 17)	Legend: “Steps to authorize radioactive discharge limits, indicating those responsible.”	Correction to be in line with the scheme presented and the introducing text at the end of Para 5.17.	X			
	France	Fig 3	Unneedful points after the words “protection” and “detail”.		X			
	UK	Page 17 Fig 3	Identify or define appropriate constraints	In many cases including UK there is a generic dose constraint set by law.	X			
		Page 17 Fig 3	Are models and assumptions valid and doses below optimized levels and below dose constraints?	Better to ask whether doses optimized and below constraints and limit.	X			
	Canada	5.20	Add a short preamble in para 5.20 in the first sentence: “In the overall context of applying best available techniques (Annex) to control releases, the government or regulatory body is responsible for ...”	In setting dose constraints, the use of “best available techniques” to control releases should be mentioned as a first consideration before setting the logic for dose constraints to highlight the overall philosophy expressed in the ANNEX on pg 53.			X	The application of “Best Available Techniques” is one possible method of optimizing releases, however some Member States may choose to use other methodologies (the requirement in the BSS is ‘to optimize the

								protection”).
3	Germany	5.21	2 nd sentence: “It should be specified to serve as a boundary <u>condition</u> in specifying the range of options in optimization of protection and safety.”	Wording adapted to be in line with the statement in the first sentence of Para 1-9 in the Annex.	X			
	Switzerland	5.21 / 3	It should be specified to serve as <u>an upper</u> boundary ...	It is very important to use a consistent definition of a dose restraint – DS432 defines in Para. 2.22 the dose constraint fully in line with the definition of ICRP – this definition should always be kept in mind when talking about dose constraints in DS 427 and DS442.	X			
	USA	5.22	Consider revision to remove the reference to the exemption level.	The source is what might, or might not be exempted. The discharge itself might only contribute only a very small dose, and a dose constraint at, or perhaps even below 100 uSv might be appropriate.			X	This comment has been reviewed, and it is considered that the existing text is appropriate.
-	ENISS	5.22	Therefore, dose constraints are likely to fall within the range of ~0.1–1 mSv per year	DS 427 says: “Dose constraints should fall within the range of 0.1–1 mSv”. The same text should be used in both drafts, either this or that way.	X			
	UK	Para 5.23	5.23. The government or regulatory body should specify the dose con-	It may not be the regulatory body that specifies the	X			

			straint	constraint. E.g. in the UK we have generic dose constraints set in law				
-	Japan	5.24 (p.19)	Dose constraints should be used <u>for the optimization through</u> prospectively assessment and should not be regarded as limits to be applied during facility operation.	Adding words for the clarification.	X			
3	Germany	5.25 (b)	“The possibility or not of dose contributions from other authorized or foreseeable future facilities and activities. ...”	Wording.	X			
-	Switzerland	5.25, lit. b	The possibility or not of dose contributions ...	Editorial	X			
		5.25(b)	Change “be discarded” to “may not be necessary”	To say that the assumption is discarded is not correct. What is true is that the assumption that there are additional contributions may not be necessary when the source under consideration is in a remote location.	X			
-	UK	Para 5.25	(b) The possibility or not of dose contributions from other authorized or foreseeable future facilities and activities. For example, in the case of a nuclear power plants, other existing of or projected nuclear power plants to be built on the same site; in the case of hospitals in urban areas, more other sources of radiation can be expected from other practices in the same city area (for example, industrial applications and other medical ap-	Clarification and simplification, and improved wording.	X	Text revised.		

			plications) and; however in the case of practices in isolated or remote areas (like uranium mining and milling), it may be assumed that there are no other contributing sources the assumption of contribution from additional local sources of radiation may be discarded.					
2	Germany	5.26	“Dose constraints should be set at levels that depend on the specific facility or activity and the expected exposure conditions at its location. However, national authorities may choose to develop generic dose constraints, for facilities activities of a similar design or characteristics (for example, for nuclear fa- ilities <u>installations</u> , for uranium mining and milling activities or facilities, for industrial and medical applications). ...”	According to the IAEA Safety Glossary (2007 Edition), the term ‘nuclear facility’ includes, by definition, facilities for the mining or processing of uranium ores or thorium ores. Consequently, when using the term ‘nuclear facilities’, the second item in brackets is superfluous and can be deleted. It is therefore proposed to replace ‘nuclear facilities’ by ‘nuclear installations’ which is more restrictive. See also our related comment on Para 1.13.	X			
	UK	Para 5.26 line 3 Lines5-9	5.26. Dose constraints should be set at levels that depend on the specific facility or activity and the expected exposure conditions at its location. However, national authorities may choose to develop generic dose constraints, for facilities or activities of a similar design or characteristics (for example, for nuclear facilities, for uranium mining and milling activities or facilities,	‘or’ needed on line 3 Deletion relates to fact that BAT is not an alternative to optimization – it is a practical manifestation of it. (note that we have provided the same comment previously) [Comment Nr.	X			

			for industrial and medical applications). The specification and use of generic and specific dose constraints in the process of optimization of the protection of the public including the alternatives to optimization, like the use of the concept of best available techniques is discussed in Section 5 and the Annex.	41] (Note: Comment Nr 41 refers to Comment from UK to Para 5.17 – footnote 13)				
2	Germany	5.27	1 st sentence: “Preoperational research <u>assessment</u> should be made to identify the inventories of radionuclides which would result in releases during operation of a facility or conduct of the activity ...”	More appropriate wording.	X			
	Australia	Paragraphs 5.27 to 5.29	Suggest add words to indicate that the source characterisation, site characterisation and predicted impact assessment can change during the life of a facility. This means that assessments have to be regularly reviewed and updated when necessary. The regulatory authority should make this clear to a proponent (and other stakeholders) at the earliest opportunity, and satisfy itself that the proponent carries out such regular reviews				X	This is addressed in Paragraph 3.19.
-	Canada	General and 5.29, 5.30, 5.65	Add a substantive paragraph to Section 5 addressing special considerations related to Aboriginal rights and lifestyles.	Throughout the document, the philosophy for discharge limits and dose constraints is focused on a representative person with conventional exposure pathways, habits, diets, lifestyles, etc. This definition of the “public” is too narrow in many circum-	X	Text added to paragraph 5.109		

				<p>stances. It needs to be fleshed out with recognition of the importance of Aboriginal rights and traditional uses of the land. These issues are legally binding in some countries and can lead to very different exposure pathways relative to a typical member of the public. Hence the framework for radiation protection must often follow two tracks, one for the representative person, and one for the many special considerations related to Aboriginal groups.</p> <p>In the context of Aboriginal interests, there is a special issue that can be of practical importance. For “sacred items”, i.e. for certain country foods or certain features of the physical environment, a system of protection based on “dose” may not be acceptable to Aboriginal peoples.</p>				
	Australia	Paragraph 5.31	Suggest modify or add to existing text.	<p>Most of the models used in environmental impact assessment studies do not require any knowledge of pre-existing background levels, only knowledge of source terms, discharge characteristics and site transfer characteristics. Therefore,</p>			X	This comment has been reviewed, and it is considered that the existing text is appropriate.

				any requirement for such pre-operational studies needs to be clearly explained and justified on other grounds (e.g. model validation, performance of containment barriers).				
2	Germany	5.31	Penultimate sentence: “The establishment of a baseline is particularly important with practices that discharge naturally occurring radionuclides (see Section 6 & below).”	Wrong section is referred to in this paragraph. Discharges of NORM are dealt with in Section 6.	X			
	Canada	Para 5.31	In para 5.31, mention noted special considerations.	In the context of Aboriginal interests, specific mention should be made for the need to sample country foods in preoperational studies, with special attention paid to any known pathways of bioaccumulation (e.g. mushrooms and Cs-137).			X	This comment has been reviewed, and it is considered that the existing text is appropriate, as the paragraph concerns the establishment of baseline radiation levels. The paragraph notes that radionuclide concentrations in food should be determined.
-	Switzerland	5.32 / 1	...should take <u>into</u> account whether	Editorial	X			
	Canada	Para 5.32	In para 5.32, mention noted special considerations.	In the context of sewage systems, exposure of sewage treatment plant workers and the possible use of sewage sludge for agricultural purposes should be mentioned as a consideration in scoping	X	Text added		

				exposure pathways.				
			Revise text to include other nuclear facilities that may also discharge to the sewer system.	Other facilities in addition to hospitals and research laboratories may discharge radionuclides to the sewer system. Facilities such as fuel fabrication facilities may also discharge to the sewer system and discharge limits are in place to control the amount released.	X – text revised			
-	Sweden	Page 21, Para 5.35	Could para 5.35 be reformulated in a clearer way – are we mixing emergency exposure and planned exposure situations? Optimization in emergency exposure situations uses reference levels and a different dose band (20-100 mSv) than during normal, planned exposure situations?		X	Reference to accidents removed in the para. to avoid confusion.		
-	UK	Para 5.36	5.36. Optimization should involve examining the available options for preventing the creation of waste and then for reducing the unavoidable discharge and its impact and all aspects of the impact of these options. Much can be achieved at the early stages of siting and design, account being taken of good practices elsewhere and the dose constraints established or approved by the government or regulatory body. In the case of liquid and gaseous residues that might be generated during operation, consideration should be given to keeping the residues to a minimum and further effluent treatment.	<p>More could be said here about the use of the 'waste management hierarchy' – prevent – reuse – recycle – reduce - dispose</p> <p>The operator should seek to prevent the unnecessary creation of waste or discharges; minimise waste generation; and minimise the impact of discharges on people and the environment; on the basis that the operators use relevant good practice, as a whole.</p> <p>The following link provides the Environment</p>			X	This comment has been reviewed, and it is considered that the existing text is appropriate, as the paragraph concerns discharges. The inclusion of waste management aspects in the optimization process is covered in paragraph 5.35.

				Agency's (England) principles of optimisation https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/296495/LIT_8452_a9c510.pdf				
2	Germany	5.37	1 st sentence: “The main types of the effluent treatment are to provide either storage facilities for gaseous and liquid residues, so that, for example, short-lived radionuclides can decay before release to the environment, or abatement treat- ment <u>techniques</u> that removes radionuclides from the effluent stream.”	More appropriate wording which ensures consistency with the terminology used in Paras 5.44 (a), (b), (d), I-19, and I-22.	X			
-	Switzerland	5.37 / 5	The various options should be identified and their <u>advantages and disadvantages</u> examined as far as possible	Editorial	X			
-	UK	Para 5.37	5.37. The main types of the effluent treatment are to provide either storage facilities for gaseous and liquid residues, so that, for example, short-lived radionuclides can decay before release to the environment, or abatement treatment that removes radionuclides from the effluent stream. Within these two broad categories, there may be a number of different options available. The various options should be identified and their features examined as far as possible. Effluent treatment may include decay storage or techniques to reduce the radionuclides in the waste stream.	Clarification and improved wording – plus ref to more detailed guidance			X	This comment has been reviewed, and it is considered that the existing text is appropriate.

			[could reference other IAEA SGs which go into detail on abatement techniques?]					
-	Switzerland	5.39 / 1	... if complex trade-offs between various features options ...	Editorial	X			
-	UK	Para 5.39	[also many other trade-offs such as accident risk, non-radiological impacts, conventional health and safety etc]	Other examples could be mentioned for emphasis.	X	[Bullet added.		
-	Australia	Paragraph 5.40	Add text at end of para: “Consultation by the regulatory body with interested parties will be an integral part of the process. Interested parties including the public are regarded as an asset that will contribute knowledge to the process, and their role will be to ensure the most informed decisions and best possible outcomes.”	The public should also be involved in this dialogue.			X	This comment has been reviewed, and it is considered that the existing text is appropriate, since this topic is discussed in paragraph 5.109 <i>et seq</i>
	UK	Para 5.41	5.41. When the projected doses to the members of the public are in the order of , or below the exemption criteria, e.g., in the order of 10 µSv per year, a detailed process for optimization should would not normally be required on the basis that the efforts for further dose reduction would generally not fulfil the optimization requirements [however it is recognised that if further reductions can be made easily with little or no trade-off then they should be made.]	Shouldn't rule out the rare cases where fairly simple and inexpensive measures can easily be applied to reduce doses below 10. Optimisation is always required in the way UK legislation is implemented and this ought to be stated at the beginning of the para. I suggest this para is also changed to a “...a detailed process for optimisation should not be	X			

				required..” Para 5.46 has better wording.				
	USA	5.41	Change “should not be required” to “may not be necessary”	It is incorrect to say that optimization is not required. If there are simple, cost effective ways to reduce exposures, they should be considered. As doses get smaller, this is more unlikely, but still should be looked at.	X	Text revised..		
	Australia	Paragraph 5.41	Add text to end of para: “ Under these circumstances, the operator should demonstrate that the projected doses are likely to remain below exemption levels under all reasonably foreseeable circumstances. ”				X	This comment has been reviewed, and it is considered that the existing text is appropriate, since this topic is addressed in Paragraph 3.19.
-	Switzerland	5.42 / 7	Or liquid operational effluents involved with very low levels of activity concentration ...	Editorial	X			
	UK	Para 5.42	or the large volumes in the gaseous or liquid operational effluents involving with very low levels of activity concentration (for example, particular radionuclides such as tritium and carbon-14 resulting from neutron activation which may arise in the coolant system of nuclear power plants).	Would be preferable to be more explicit about which radionuclides are being referred to i.e. “special radionuclides”			X	This comment has been reviewed, and it is considered that the existing text is appropriate, since, for example, tritium is not necessarily in low activity concentrations in all reactor designs.
2	Germany	5.43	Last sentence: “Examples of these radionuclides are tritium	Discharges of tritium and C-14 requiring special	X			

			and C-14 discharged from nuclear facilities <u>installations</u> , including nuclear power plants, and radionuclides (e.g. Tc-99m, I-131) used in hospitals for medical diagnosis and therapy.”	consideration and regulatory control are a typical feature of certain types of nuclear installations, in particular NPPs and re-processing facilities. It is therefore proposed to replace ‘nuclear facilities’ by ‘nuclear installations’ which is more restrictive. See also our related comment on Para 1.13.				
	UK	Para 5.44	(a) the technical characteristics related to the control of discharges of this these radionuclides, such as the availability of abatement techniques on a scale consistent with the needs for the particular practice (in particular for large volumes of liquid or gaseous effluents with low concentrations of radionuclides);		X			
			d) environmental and efficiency considerations such as the effects of any releases of hazardous chemical substances or high energy consumption entailed by the radionuclides abatement techniques;		X			
			e) safety considerations such as those related to the safe storage of large amount of radioactive solid, liquid or gaseous material for long times, implying an with a potential increase in the risk of accidental releases;		X			
-	Japan	5.44(f) (p.23)	Explanation of “ intermediate- to long-lived nuclides ” should be added to this paragraph or	Definition of “intermediate - to long - lived nuclide”	X.	Text modified and footnote added		

			as a new footnote.	is vague.				
2	Germany	5.45	Last sentence: “Examples of the more stringent verification of compliance measures for complex installations <u>facilities</u> , including nuclear facilities <u>installations</u> , could be ...”	To be in line with our proposal for Para 5.5. The term ‘nuclear installation’ is more restrictive than ‘nuclear facility’. See also our related comment on Para 1.13.	X			
	UK	Para 5.45	5.45. The regulatory body and the operating organization should take into account that, for the above mentioned practices and radionuclides, the optimal management option might not result in the minimization application of specific abatement techniques of the activity to be discharged , but in the application of more stringent verification of compliance measures, by the operating organization and the regulatory body, as relevant. This optimal management option and the justifications should be presented by the operating organization and endorsed by the regulatory body. Examples of the more stringent verification of compliance measures for complex installations, including nuclear facilities, could be (a) a radionuclide specific source and environment monitoring programme; (b) more detailed dose assessment to the representative person, including the identification of relevant exposure pathways; and (c) more frequent reporting to the regula-	Clarification I think what this para. is referring to is ‘end of pipe’ removal/abatement and not other management measures that could be taken.	X	Text modified		

			tory body.				
		Para 5.46	5.46. Depending upon the circumstances, the process of optimization of the protection of the public can include the use of a variety of quantitative and qualitative techniques. Formal decision-aiding techniques should be used as appropriate in the optimization process. It was previously mentioned before that when the doses to the representative person are assessed to be very low	editorial	X		
2	Germany	5.46	Last sentence: “Nevertheless, the regulatory body should determine the type of installation that ... would require that an optimization process is conducted (for instance, this is the case for nuclear facilities <u>installations</u> or other complex installations <u>facilities</u>).”	To be in line with our proposal for Para 5.5. The term ‘nuclear installation’ is more restrictive than ‘nuclear facility’. See also our related comment on Para 1.13.	X		
	ENISS	5.46	Nevertheless, the regulatory body should determine the type of installation that, despite the doses to the public due to releases during normal operation are very low, would require that an optimization process is conducted (for instance, this is the case for nuclear facilities or other complex installations).	This text needs to be deleted. An optimization of doses below some 10 µSv/a is not possible, neither necessary. These doses are “of no concern”.	X		
	UK	Para 5.46	COMMENT - Further explanation would be beneficial for the reasoning behind the apparent inconsistency in approach between nuclear facilities and less complex installations where the doses to the representative person are assessed to be very low (<10µSv in a year)	Para 5.41 states that for doses in the order 10µSv in a year optimization should not be required on the basis that efforts for further dose reduction	X	Text revised.	

				would generally not fulfil the optimisation requirements Does this not effectively render the 10µSv dose as a de-minimis value below which further dose reduction is not justified. If so, it is unclear why para 5.46 introduces a statement in the document that provides the regulating authority with a remit to require an optimisation process for discharges from nuclear facilities into the same environment.				
	France	5.46	Delete “Nevertheless, the regulatory body should determine the type of installation that, despite the doses to the public ... are very low, would require that an optimization process is conducted (...)” and replace by “When the projected doses to the representative person are in the order or below the exemption criteria, e.g., 10 µSv in the year, a process for optimization should not be required.”	To prevent from irrelevant studies	X	Text revised.		
	Switzerland	5.48 / 5	An adequate use of best available techniques <u>is equivalent</u> to optimization and, <u>therefore</u> , the demonstration <u>of the use</u> of best available techniques would demonstrate optimization.	Editorial	X	Text revised.		
	Sweden	Page	Include a statement to that the used tech-	We should only used	X			

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

		23, Para 5.48	nique should also be “well tested” or verified.	verified, “well-tested” techniques.				
	UK	Para 5.48 line 7	The best available techniques assessment does not simply consider what techniques are or could be available to reduce discharges but considers the situation as a whole to determine what is optimum, including the availability of the options and the costs involved.	Editorial Note also that the definition of BAT given in Annex A in the hyperlink above may be useful. This could be an alternative to the footnote 14	X	Text revised.		
	USA	5.48	Suggest revision as follows: Concepts such as best available techniques ¹⁴ are used in some States [21] and under certain international frameworks [22, 23] and in other industries for controlling pollutants generally. an adequate use Use of best available techniques corresponds to optimization and demonstration of best available techniques would demonstrate optimization if the The best available techniques assessment does do not simply consider what techniques are or could be available to reduce discharges but consider the situation as a whole to determine what is optimum, including the availability of the options and the costs involved.	The statement that BAT equals optimization is true only if the last sentence is true about all factors being considered. Consideration should be given to a caveat.	X			
3	Germany	5.50	1 st sentence: “Collective dose ... can be obtained by multiplying the average dose to the exposed group by the number of individuals in the	Editorial.	X			

			group [16, 24].”					
	USA	5.50	Add sentence at end of paragraph: Collective dose should only be used in the comparison of options, and any truncation applied to the calculations must be consistent so that the comparisons are valid.	A sentence needs to be added to avoid the perception that collective dose can be used to give a direct measure of impact. Collective dose should only be used in the comparison of options to assist in optimization.	X			
-	Australia	Paras 5.49 to 5.51		Collective dose is not particularly useful for detailed assessments. It works best for populations where exposures are reasonably uniform.	X	Text revised.		
-	Sweden	Page 25, Para 5.50	The last part of the paragraph – estimating collective doses to the public and avoiding inappropriate aggregation etc. Seems to have more to do with <u>not using such collective doses to calculate absolute risks</u> ? They can still be used for comparison between options and alternatives. Misunderstanding?		X	Text revised.		
-	Switzerland	5.50 / 2	... the average dose _e ...	Editorial	X			
	Australia	Paragraph 5.52		Most environmental transport processes are not reversible. Therefore, using back-	X	Text modified		

				calculation can introduce extra uncertainties. Back-calculation works best in combination with forward calculation, as part of an iterative process.				
-	UK	Para 5.54 line 1	5.54. The level of details		X			
-	ENISS	5.54	<p>In order to make an effective use of assessment resources, a structured iterative approach should be used for assessing doses to the representative person <u>may be useful</u>. ...</p> <p>... Such an approach should start with a simple assessment based on very cautious (conservative) assumptions and should be refined with each iteration using progressively more complex models with more realistic assumptions and data, <u>if the result does not meet the predefined criteria as necessary</u></p>	An iterative procedure is not needed when the criteria are fulfilled even through a simple and conservative assessment.	X		X	This part of the comment has been reviewed, and it is considered that the existing text is appropriate.
-	Switzerland	5.54 / 3	In order to make an effective use ...	Editorial	X			
3	Germany	5.55	“At the time of setting the discharge limits, a site-specific assessment should normally be used for nuclear fuel cycle facilities and other complex <u>nuclear</u> installations.”	Wording.	X			
-	ENISS	5.56	The use of generic assessments should be used for assessing the impacts from small facilities such as hospitals with small nuclear medicine departments and small	Reference to hospitals is not adequate. Hospitals may have remarkable discharges.	X			

			research laboratories because discharges from such facilities are usually <u>with</u> low to very low <u>discharges</u>.					
	Australia	Paragraph 5.56	Add text to end of para: “ Discharges from hospitals are frequently not continuous, and can involve short releases of relatively high radionuclide concentrations as well as long-term low level releases. Assessments of such facilities should take into account such things as potential exposures of inspectors and maintenance workers in sewerage systems, as well as exposures to other members of the public (and possibly hospital workers). ”		X	Text revised.		
-	UK	Para 5.56	We note that the impact on the representative person from a hospital using I-131 discharging to a sewer and a river can potentially be significantly greater than a NLS discharging to the sea.		X	Text revised.		
	Switzerland	5.56 / 3	... are usually low to very low	Editorial	X			
3	Germany	5.57	1 st sentence: “A generic approach may also be used to estimate doses to the representative person at the early stages in the lifetime of a complex <u>nuclear</u> installations (see Figure 2), ...”	Wording.	X			
	UK	Para 5.57 line 5	should be followed by a more site-specific realistic assessment; once more information became becomes available during the li-	editorial	X			

			censing process					
	Australia	Para-graph 5.57	Add text to end of para: “ For larger facilities, these assessments should be performed in the context of development of the safety case for the facility in question. ”				X	This comment has been reviewed, and it is considered that the existing text is appropriate and the necessary level of detail, etc. is addressed in the referenced Safety Guide (DS427).
	UK	Para 5.58	5.58. When doses estimated with a generic approach are above the constraint, the reduction of projected discharges (the total amount of certain radionuclides) or a change in their characteristics (for example, the location points of discharge or the speed of the effluents to provide more dispersive conditions) by mean of a technological improvement in the installation should be considered. Alternatively, a more detailed assessment (site specific or with more realistic models) should be applied. In any case, if a generic cautious assessment is used then it should be ensured that this does not unduly affect the optimization process. Adopting cautious assumptions in the calculations that are likely to significantly over-estimate the doses estimated to the public could lead to decisions that are sub-optimal which would result in lower doses to the public but with higher costs and possibly higher doses to workers, not resulting optimal.	clarification	X			

3	Germany	5.58	1 st sentence: “... by means of a technological improvement in the installation ...”	Editorial.		X – text revised.		
-	Switzerland	5.58 / 8	... to avoid overestimation . (Please note that this comment refers to 5.60/8 rather than 5.58/8).	Editorial	X			
-	Switzerland	5.58 / 10	... and possibly higher doses to workers and are not optimal.	Editorial	X	Text revised.		
-	UK	Para 5.59 line 7	(e.g. i.e. the representative person)	The whole sub-section is dedicated to the representative person.	X			
-	ENISS	5.60	However, the habits (e.g. consumption of foodstuffs, inside or outside occupation factors, usage of local resources) adopted to characterize the representative person should be typical habits or characteristics of a small number of individuals representative of those most more highly exposed	To be in line with footnote 7.	X			
	USA	5.61(c)	“External exposure may be caused by radioactive material in the air and deposited on the ground. More details on the exposure pathways relevant for assessment of doses to the representative person are discussed in Refs. [8, 12, 13].”	Suggest moving discussion in 5.61(c) on “Internal exposure...” into 5.61(a) on “External exposures...”			X	This comment has been reviewed, and it is considered that the existing text is appropriate.
-	UK	Para 5.61	The doses from shine from facilities can be significant on the dose to the representative person.		X	New paragraph added		
-	Switzerland	5.62 / 4	... Subsequently , environmental transfer models and parameters should then be used ...	Editorial	X			
-	UK	Para 5.62	In considering the long term effects of radionuclides the impacts of ingrowth		X	Text modified		

			needs to be considered e.g. Pu discharges					
-	Australia	Paragraph 5.63	Replace “ensuring that the assessment methodologies provide reasonable accuracy” by “ ensuring that the assessment methodologies are suitable to demonstrate that there is a high likelihood that all compliance requirements can be met under all reasonably foreseeable conditions ”.	The aim of prospective modelling is to demonstrate that there is a high likelihood that all compliance requirements can be met under all reasonably foreseeable conditions. Therefore using accurate models is not necessarily the best approach. The modeller should be able to demonstrate that the model is appropriate, has been properly validated, and is conservative but not excessively so.	X			
	Switzerland	5.63 / 7 5.63 / 9	... The national regulatory body should agree be satisfied that the methodology adopted possibly in discussion with the applicant of the facility or activity ...	Editorial	X			
2	Germany	5.64	2 nd sentence: “... while the embryo or fetus and breast fed	More stringent formulation.	X			

			infants also being considered in some limited circumstances [16], for example when, due to the radionuclides to be discharged, the exposure conditions to those could be foresee as <u>are</u> more significant (e.g. radioiodine).”					
	ENISS	5.66	Taking into account the lifetime of a discharging facility, the location and lifestyle habits of the representative person should be specified with regard to the present and <u>as reasonably foreseeable</u> future environmental conditions, land use, spatial distribution of population, food production, distribution and consumption plus other relevant factors.	To make clear that this development can only be predicted under certain assumptions and with uncertainty.	X			
	Canada	5.66/Line 3	Alter 5.66 as indicated below. When determining the location and lifestyle habits of the representative person it should be ensured that adequate protection is provided not only for local populations but also for populations remote from facilities now and in the future. When determining the location and lifestyle habits of the representative person for remote sites with little or no local populations, consideration should be given to developing a theoretical representative person based on a reasonable exposure scenario capturing land use practices such as fisher, hunter/trapper or other seasonal or periodic land use practice that may be associated with the nearest community. Taking into account the lifetime of a discharging facility, the location and lifestyle habits of the representative person should be specified with regard to the present and future environmental conditions, land use, spatial distribution of population, food production, distribution and consumption plus other relevant factors.	It is assumed that this paragraph is attempting to address the situation where there is no local population. An example would be facilities such as mines and or mills which can be located in extremely remote regions with no “local” population. In such scenarios staff are flown in and out of site on an extended rotational basis (e.g., week in and week out). Members of the “nearest community” may periodically utilize lands and resources within the local air and watersheds of the facility. Thus the context of this paragraph should be whether there are reasonable exposure scenarios which can be developed for specific facility based on land use practices of the “nearest” community.	X	Sentence added to the end of the paragraph.		

	Australia	Paragraph 5.66	Modify text: “the location and lifestyle habits of the representative person should be specified with regard to the present and future environmental conditions, land use, spatial distribution of population, food production, distribution and consumption plus other relevant factors, together with consideration of possible future demographic changes. ”		X	Text modified		
	USA	5.67	“The regulatory body will grant or question...”	5.71 provide will statements on discharge limits, but corresponding statements for regulatory body are only should?	X	“Should” is appropriate for a Safety Guide. Statement in 5.71 changed.		
	USA	5.68	“The regulatory body will record formally...”	See above reason.			X	This comment has been reviewed, and it is considered that the existing text is appropriate.
	Switzerland	5.69 / 2	These should take <u>into</u> account the results ...	Editorial	X			
3	Germany	5.69	2 nd sentence: “These should take <u>into</u> account the results of optimization of protection and safety and should be in accordance with a graded approach.”	Missing word.	X			
2	Germany	5.70	1 st sentence: “Large complex facilities such as nuclear facilities <u>installations</u> are subject to a comprehensive licensing process which should include provisions for establishing detailed conditions for authorization of discharges.”	To be in line with our proposal for Para 5.5. The term ‘nuclear installation’ is more restrictive than ‘nuclear facility’. A comprehensive, step-wise licensing process is a typical feature of nuclear	X			

				installations and is dealt with in the Safety Guide SSG-12.				
-	UK	Para 5.70 – line 8	The use of dose versus activity is more discussed further in the Annex.		X			
	USA	5.71	“Discharge limits will be written... and will become regulatory limits... with which the operating organization or licensee will comply.”	See above reason. Operating organization or licensee complies (not should) with regulatory limits.	X	Text revised to use “should”, which is appropriate for a safety guide.		
3	Germany	5.72	2 nd sentence: “The period of validity for complex nuclear installations – like nuclear power plants, reprocessing facilities and radioisotopes production facilities – should be the same than the period of validity of the authorization of the practice, ...”	Wording. The term ‘nuclear installation’ covers the examples provided in this sentence.	X			
	Switzerland	5.72 / 6	... with provisions for its review, at least every five-ten years	In order to be in line with the PSR for NPP, which takes place typically every ten years (SSG-25, Para 1.4), it would be useful to foresee the review of the discharge limits also every ten year and to link both.	X			
	France	5.72	Change “five years” by “ten years”.	The length of the authorization process makes the frequency of 5 years unreasonable	X			
	ENISS	5.72	The period of validity of the discharge limits should be specified in the discharge authorization or elsewhere, with provi-	The limitation of the authorization for discharges makes no sense	X	Changed to once every ten years to be in line with the PSR for NPPs		

			<p>sion to review at intervals as deemed appropriate by the regulatory body. The period of validity <u>of the discharge authorisation</u> for complex installations – like nuclear power plants, reprocessing facilities and radioisotopes production facilities – should be the same than the period of validity of the authorization of the practice, with provisions for its review, <u>if significant changes are planned or occur</u>. at least once every five years. More simple installations like facilities or activities using limited amounts of radioisotopes should be reviewed periodically but at longer intervals. A new source for which experience is limited should be reviewed by the regulatory body at least once in the first three years. <u>after an appropriate time when sufficient operational experience has been gathered.</u></p>	<p>when the license for the whole facility is unlimited, which is the case usually. A review is needed if changes occur. Periodic reviews of more complex facilities are common at intervals of ten years (see NS-R-3, rev.1 or SSG-25 or SSR-2/2)</p>		(SSG-25).		
-	Sweden	Page 30, Para 5.72	<p>Suggests: ...<i>at least once every ten years</i>...</p>	<p>Five years is a too short period also for a complex installation. Ten years would be more appropriate – the same time interval which is required for performing a periodic safety review seems more reasonable.</p>	X			
-	UK	Para 5.72	<p>The paragraph refers to a new source, in reality is the intent for a new practice?</p>		X	Text modified.		
-	UK	Para 5.74 –	<p>A surrogate operational parameter may</p>	<p>Don't understand</p>	X	Footnote is now deleted		

		footnote 16	sometimes be used instead. For example, the discharge authorization of a facility in which xenon-133 is used in operations in fixed quantities could define the maximum number of studies that may be conducted in a given period of time. This approach has the merit of simplicity but is generally available only for relatively simple operations.					
		Para 5.74 – footnote 16	Replace entire footnote with: “A surrogate operational parameter may sometimes be used instead. For example, the discharge authorization (100 GBq per year) of a facility in which xenon-133 is used in operations in fixed quantities (of 5 GBq) could define a maximum number of studies that may be conducted in a given period of time (20 per year). This approach has the merit of simplicity but is generally available only for relatively simple operations.	Clarity	X			
-	UK	Para 5.76-5.79	[would be useful to state that the monitoring techniques to be used should be specified and agreed by the regulatory bodies. This is particularly important for gross alpha and beta monitoring techniques.]	Clarity of regulatory body's role in approval			X	This topic is addressed in 5.86.
3	Germany	5.77	3 rd sentence: “Examples of these radionuclides are Cs-137, Co-60, C-14 and tritium (C-14 and tritium is <u>are</u> discussed in a separate section above, paragraphs 5.42 to 5.45).”	Editorial.	X			
2	Germany	5.78	2 nd and 3 rd sentence:	Grouping of airborne dis-	X			

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

			“The use of scaling factors should be applied for certain radionuclides that cannot be promptly analysed as part of routinely measurements at nuclear facilities <u>installations</u> (for example, Ni-63, Fe-55 and Sr-90). Airborne discharges from nuclear facilities <u>installations</u> are often grouped as follows: noble gases, halogens or iodine isotopes, and particulates.”	charges is typically applied for nuclear installations. It is therefore proposed to replace ‘nuclear facilities’ by ‘nuclear installations’ which is more restrictive.				
	Canada	Section 5, para 5.78	Consider the appropriateness of ISO 12378 Nuclear energy – Nuclear fuel technology for use as guidance to be referenced in this paragraph.	Scaling factors need to be derived based on a sufficient number of direct measurements. Guidance on deriving scaling factors is provided in ISO 12378 Nuclear energy – Nuclear fuel technology – Scaling factor method to determine the radioactivity of low- and intermediate-level radioactive waste packages generated at nuclear power plant.	X	Text modified (but ISO 12378 couldn't be found)		
	UK	Para 5.78	The assessment of discharges by grouping of radionuclides should only be undertaken when an appropriate characterisation of that grouping has been performed, this characterisation should be reviewed periodically to ensure that the characterisation remains representative.				X	The comment is noted, but is difficult to address without a specific recommendation from the reviewer.
	UK	Para 5.79	When using the type of emission to set a limit e.g. gross alpha and gross beta a suitable method of analysis should be specified as the value of the measurement is entirely depend-				X	The comment is noted, but is difficult to address without a specific recommendation from the reviewer.

			ent on the method, which requires simultaneous definition of method and the limit. (This is repeated in I-34).					
	France	5.79	Add at the end of the § “In the case of uranium discharges, a limitation express in kilogram (and considerations about the % of each uranium isotope) is more adapted than a limitation in gross alpha”		X	Text revised.		
	Switzerland	5.80	The regulatory body should include in the authorization <u>or in other regulatory documents</u> conditions for reporting ...	In Switzerland the conditions for reporting are set in a guideline, but not directly in the authorization.	X			
	Switzerland	5.81 / 3	... in the discharge authorization <u>or in other documents</u> issued by the regulatory body.	See Pt. 36 above	X			
3	Germany	5.83	2 nd sentence: “For complex <u>nuclear</u> installations, like nuclear power plants or reprocessing facilities, environmental monitoring should also provide an additional means, besides effluent monitoring, of checking for unexpected releases.”	Wording. The term ‘nuclear installation’ covers the examples provided in this sentence.	X			
	Switzerland	5.83 / 2	... to check the assumptions used to evaluate doses <u>to the representative person, monitoring programmes for the source and the environment</u> should be established	Editorial	X			
	UK	Para 5.84	5.84. Simpler installations, like small hospitals or small research laboratories using short living lived radionuclides,	editorial	X			

-	Australia	Para-graph 5.84	Add text to end of para: “Even for these “simpler” installations, changes in operational procedures can lead to increased discharges. The necessity and frequency of monitoring should be determined by the assessed level of risk, the aim being to demonstrate that the discharges remain in compliance with authorized limits.”		X			
	Turkey	5.84 and 5.91	Criteria may be given for facilities by which environmental monitoring activities should be performed	Public dose (greater than 10 µSv/yr) or power level of reactors might be used as criteria for facilities for which environmental monitoring programme is obliged. Otherwise how are small research reactors for which this programme is warranted determined? Public dose criteria was set forth in the previous IAEA WS-G-2.3 safety guide, which will be superseded by this draft.			X	This comment has been reviewed, and it is considered that the existing text is appropriate, as Member States may wish to establish their own criteria for requiring environmental monitoring programmes.
	Japan	Page 33 Para 5.85. /L1	and off -site	Typo.	X			
3	Germany	5.85	“The requirements for on-site (source) and off-site (environmental) monitoring should be specified in the discharge authorization by the regulatory body.”	Editorial.	X			
	ENISS	5.85	The requirements for on-site (source) and off-site (environmental) monitoring should be specified in the discharge authorization by the regulatory body.	On-site monitoring could also include environmental monitoring	X			
	UK	Para		editorial	X			

		5.85	5.85. The requirements for on-site (source) and off -site (environmental) monitoring					
	Switzerland	5.85 / 1	... and off -site (environmental) monitoring ...	Editorial	X			
-	UK	Para 5.86	Comment	Responsibility for ensuring dose compliance lies with the member state not the licensee.			X	The comment is noted, but is difficult to address without a specific recommendation from the reviewer.
		Para 5.86	Replace 1 st sentence with: “Registrants and licensees should establish and use monitoring programmes to verify and demonstrate compliance with their authorization and to enable adequate assessment of the public exposure due to sources for which they are responsible.”	Addresses SEPA Comment Nr. 71.(Note: Comment Nr 71 refers to comment from UK to Para 5.86 above)	X			
3	Germany	5.87	“... (a) monitoring of the source, which implies measuring activity concentrations or dose rates at the discharge point or within the activity and facility; and (b) monitoring of the environment, which involves the measurement of radionuclide concentrations in environmental media (including foodstuffs and drinking water) and doses or dose rates due to sources in the environment.”	For internal consistency, please denominate all measured quantities either in Singular or in Plural.	X			
-	Switzerland	5.91 / 1	Monitoring programmes should be in line with the graded approach.	Editorial	X			
	Turkey	5.92	The content of quality assurance programme should be improved; the paragraphs from IAEA WS-G-2.3 (pa-	The content of QA programme is better explained in the previous document	X	Text from WS-G-2.3 added.		

			ra. 4.5 and 4.6) may be insertes into this draft.					
-	UK	Para 5.93	However, regulatory bodies may choose to undertake some practices like nuclear reactors should undergo independent monitoring in any case for purpose different than discharge limits compliance for other reasons (see below).	Clarification and leaves decision to the discretion of the regulatory body	X			
	Canada	Para 5.93	In para 5.93, add text to address reviewer comment.	It is important to state in this paragraph that the independent monitoring by the regulatory body does not replace the environmental monitoring that is conducted by the operating organization. Further, the overall objective of independent monitoring should be more clearly stated: to verify that the public and the environment are not adversely impacted from releases from nuclear facilities.	X	Text revised.		
	Canada	5.93/Line 1	Suggest the following edits for 5.93: 5.93. The regulatory body should make provision for independent monitoring. The characteristics and the resources devoted to independent monitoring should be based on a graded approach but should incorporate standard best practices and scientifically defensible methodologies.	When compiling independent monitoring results, it is important to accurately compare between the independent and proponent led monitoring programs. As proponents are expected to adhere to best practices and scientifically defensible methodologies with respect to monitoring and investigations, so too should the regulator	X			
	UK	Para 5.95 line 2	This should include the assessment of doses to the representative person from environmental monitoring	Env monitoring data are preferred if available and suitable.	X			

			measurements or from measurements of the actual discharges	+delete first sentence of 5.96?				
-	Switzerland	5.97 / 2	The regulatory body should establish the <u>content</u> and <u>the</u> frequency of <u>the reports</u> of these records.	Editorial	X			
-	Switzerland	5.98 / 2	... the main operational and discharge <u>features data</u> in the period covered ...	Editorial	X			
	France	5.99	A “in” is missing after “should be” (Please note that this comment refers to 5.91 rather than 5.99).		X			
	USA	5.101	“The regulatory body will verify compliance...”	See above reason.			X	This comment has been reviewed, and it is considered that the existing text is appropriate for a Safety Guide.
	USA	5.102	“The regulatory body will establish a process...”	See above reason.			X	This comment has been reviewed, and it is considered that the existing text is appropriate for a Safety Guide.
-	UK	Para 5.104	5.104. The actions to be taken by the regulatory body in response to non-compliance should be graded according to the seriousness of the failure. It may range from a simple warning, criminal prosecution and imposition of fines through to suspension or withdrawal of the authorization.	For emphasis	X			

3	Germany	5.105	... BEST AVAILABLE TECHNIQUES ...	Typo.	X	Text revised.		
	Turkey	5.105/for th line	“BEST AVAILABLE TECHNIQUES”	Grammar correction.	X	Text revised.		
	UK	Para 5.105	5.105. Discharge limits are set taking into account the relevant dose constraints and the process of optimisation so any breach of discharge limits may not result in a breach of the dose limit. However any breach of discharge limits should result in an investigation and follow-up actions to improve the situation.	Not sure what para was trying to say so potential alternative suggested. See also earlier comments about best available techniques (note that it should not be in upper case and techniques is spelt incorrectly in the draft) being a form of optimisation and not an alternative to it.	X			
	UK	Para 5.108	5.108. The approval of the regulatory body should be obtained before any changes that may significantly affect doses or the safety of operations are made. When such changes may affect the discharges from the facility, the regulatory body should review the authorization and revise it as necessary.	Needs to be proportionate of ‘graded’.	X			
	Australia	Paragraph 5.108	Add text to end of para: “Any changes to authorized discharge limits should be communicated to all interested parties.”		X			
	Australia	Paragraph 5.110, 2nd sentence	Replace “Such exchange of information are likely to consider social aspects” by “Such exchange of information should include consideration of social aspects”.		X			

	UK	Para 5.110 line 4	Such exchange of information are is likely to consider social aspects, for example, public con	editorial	X	Text revised.		
3	Germany	5.112	“As noted in para. 2.18 there is a requirement to exchange information with other States when a discharge could cause public exposure to these s States; ...”	Editorial.	X			
-	Australia	Paragraph 5.112	Correct para: “As noted in para. 2.18 3.18 there is a requirement to exchange information with other States when a discharge could cause public exposure to these S States; for example, when a nuclear facility will discharge into an international waterway, or when the representative person may be in a neighbouring country”		X			
3	Germany	Title of Section 6	“CONSIDERATION OF NATURALLY OCCURRING RADIONUCLIDES IN DIFFERENT INDUSTRIES”	Editorial.	X			
1	Germany	Section 6	Note: Due to the economic importance of many NORM industries, Section 6 deserves more attention and should be more elaborated in this Safety Guide. For further development of the text, we recommend using the following publications of the European Commission and the IAEA as a basis: <ul style="list-style-type: none"> • European Commission: Effluent and dose control from European Union NORM industries: Assessment of current situation and proposal for a harmonised Community approach (Luxembourg, 2003); • IAEA: Radiation protection and the man- 	The interfaces as well as the thematic separation between DS459 “Management of Radioactive Residues from Mining, Mineral Processing, and other NORM Related Activities” and Section 6 of DS442 remain unclear. For example, one disposal option for NORM wastes is the dilution and dispersion into the surrounding environment through the discharge of liquid and	X	Text revised and IAEA references added; European Commission documents are mentioned in footnotes as necessary.		

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

			<p>agement of radioactive waste in the oil and gas industry, Safety Reports Series No. 34 (Vienna, 2003);</p> <ul style="list-style-type: none"> • IAEA: Assessing the need for radiation protection measures in work involving minerals and raw materials, Safety Reports Series No. 49 (Vienna, 2006); • IAEA: Radiation protection and NORM residue management in the zircon and zirconia industries, Safety Reports Series No. 51 (Vienna, 2007); • IAEA: Radiation protection and NORM residue management in the production of rare earths from thorium containing minerals, Safety Reports Series No. 68 (Vienna, 2011); • IAEA: Radiation protection and NORM residue management in the titanium dioxide and related industries, Safety Reports Series No. 76 (Vienna, 2012); • IAEA: Radiation protection and management of NORM residues in the phosphate industry, Safety Reports Series No. 78 (Vienna, 2013); • IAEA: Extent of environmental contamination by naturally occurring radioactive material (NORM) and technological options for mitigation, Technical Reports Series No. 419 (Vienna, 2003). 	<p>gaseous effluent within authorized limits. This may be an acceptable option when activity concentrations are only moderately above clearance levels. This approach may also be applicable to some solid residues from NORM industries. Dilution of NORM residues with other materials should require the review and approval of the competent authority. It should be clarified which Safety Guide (DS442 or DS459) covers this topic.</p> <p>Detailed information on radiation protection in specific NORM industry sectors is provided in the publications of the IAEA Safety Reports Series and IAEA Technical Reports Series listed at the left.</p>				
2	Germany	6.1	<p>“In general, for facilities and activities not exempted from (nuclear) regulatory control there is no distinction in the manner to control the discharges from natural or artificial radionuclides. This is for example the case in nuclear fuel reprocessing plants, uranium conversion and enrichment plants, nuclear installations, but also in uranium and thorium</p>	<p>Spent fuel reprocessing plants, uranium conversion plants and uranium enrichment plants are, by definition, nuclear installations. On the other hand, uranium and thorium mining and processing fa-</p>	X			

			mining and processing facilities. ...”	cilities are excluded from this definition. See also our related comment on Para 1.13.				
3	Germany	6.1	Last sentence: “... as discussed in Section 5, paragraph 5.48 and in in the Annex.”	Editorial.	X			
-	UK	Para 6.1	6.1. In general, for facilities and activities not exempted from (nuclear) regulatory control there is no distinction in the manner to of controlling the discharges from natural or artificial radionuclides.		X			
-	UK	Para 6.2	6.2. Some non-nuclear industries may have releases containing naturally occurring radioactive material (NORM). In some States, some of these industries involving NORM are under national authorities different to the regulatory body and therefore, discharges have may not have been subject to regulatory control with respect to radioactive substances.		X			
-	Australia	Paragraph 6.2	Correct “different to” to “ different from ”.	Consider incorporating the current definition of NORM as ‘material containing predominantly naturally occurring radionuclides	X		X	This comment has been reviewed, and it is considered that the existing text is appropriate as NORM is defined in the IAEA Safety Glossary.

				whose activity concentrations have been altered (generally enhanced) by human action.'				
1	Germany	6.3	<p>Please add two sentences with the following text: “... are enriched in residues. A general review of the radiological aspects of industrial activities involving NORM is given in Ref. [29]. Para 3.162 of Ref. [30] provides a full list of industrial activities involving NORM that are, or may be, subject to the requirements for planned exposure situations.”</p> <p>The IAEA Safety Reports Series No. 49 and the IAEA Draft Safety Guide DS453 should be added to the list of references:</p> <p>“[29] INTERNATIONAL ATOMIC ENERGY AGENCY, Assessing the Need for Radiation Protection Measures in Work Involving Minerals and Raw Materials, Safety Reports Series No. 49, IAEA, Vienna (2006).”</p> <p>“[30] INTERNATIONAL ATOMIC ENERGY AGENCY, Occupational Radiation Protection, IAEA Safety Standards Series, Safety Guide DS453, in preparation, IAEA, Vienna.”</p>	<p>The IAEA Safety Reports Series No. 49 identifies the relevant industrial activities involving NORM most likely requiring regulatory consideration. It provides further information to assist regulatory bodies in assessing the need for radiation protection measures, including the management of any releases of effluents to the environment. Para 3.162 of the Draft Safety Guide DS453 “Occupational Radiation Protection” (revision and combination of RS-G-1.1, RS-G-1.2, RS-G-1.3, RS-G-1.6 and GS-G-3.2) refers to this Safety Report. The final version of DS453 was endorsed by the CSS in April 2015.</p>	X	References added. That identified as [29] in the proposal to this para. and [30] was added to a new para. in the introduction.		
-	Canada	6.3/7	<p>Consider revision below:</p> <p>“For example, in the phosphate industry, fertilizers become naturally <i>elevated enriched</i> with uranium...”</p>	<p>Enriched uranium has a much different context than intended in this discussion.</p>	X	The term “enhanced” is used now in the text		.

3	Germany	6.4	... BEST AVAILABLE TECHNIQUES ...	Typo.	X			
	UK	Para 6.4	6.4. Where within those industries, the activity concentration in the material of any radionuclide in the uranium or thorium decay chains is greater than 1 Bq/g or the activity concentration of 40K is greater than 10 Bq/g the airborne or liquid releases should be controlled according to the requirements for discharges from planned exposure situations (e.g. considering a radiological environmental impact assessment, specifying dose constraints, assessing doses to representative person, applying optimization or BEST AVAILABLE TECHNIQUES best available techniques as relevant, authorizing discharge limits and establishing monitoring programmes).	Is the highlighted text correct? – we do not class any waste with only K-40 as radioactive waste			X	Text is from BSS
-	Australia	Paragraph 6.4	Add text to end of para: “In cases where the relevant concentrations are below the 1 Bq/g or 10 Bq/g levels, the regulatory body may require an assessment of the doses delivered based on actual exposure scenarios.”	Simply relying on the 1 Bq/g and 10 Bq/g levels can lead to problems as the doses delivered depend on the actual exposure scenario(s), and not just on the radionuclide concentrations.	X			
3	Germany	6.5	“It should be considered that the exemption levels for NORM could be higher than the	While ‘nuclear industry’ is a well-established term,	X	Text modified.		

			exemption level for the nuclear and radiological industry <u>and the industrial sectors using radioactive sources</u> and, consequently, influencing the specification and use of dose constraints, if applicable.”	its counterpart ‘radiological industry’ is very uncommon and rarely used.				
	UK	Para 6.5	6.5. It should be considered that the exemption levels for NORM could be higher than the exemption level for the nuclear and radiological industry manmade radionuclides and, consequently, influencing the specification and use of dose constraints, if applicable.		X	Text modified, quoting BSS		
	Australia	Paragraph 6.5		Needs further explanation, as there is no radiological basis for this statement. The impact of 1 Bq of U and Th from the nuclear fuel cycle is the same as the impact of 1 Bq of U and Th from NORM (for the same exposure scenario).			X	The comment is noted, but is difficult to address without a specific recommendation from the reviewer.
	Australia	Paragraph 6.6(a)	Add text to end of para: “ Alternatively, use may be made of an appropriate modelling package for assessing the impact of area sources. ”	There are good modelling packages available for assessing the impact of area sources. For example, the RESRAD-OFFSITE package estimates doses from area sources of	X			

				radon.				
	Canada	Para 6.6	Consider revision below: (c) Specific assessments should be carried out to identify samples to be included in the environmental monitoring programme so that any increment may be followed in time. However, environmental monitoring may also be necessary is advisable to reassure the local population. In some circumstances, it may be necessary to include the monitoring of radon and dust close to main source areas, such as venting stacks and waste piles.	The phrase “may also be necessary” should be revised to “is advisable”. Practical experience in Canada indicates that what is sometimes termed “comfort” environmental monitoring is important to reassure the public of safety, even if extensive scientific analysis and modelling indicate that there are no impacts. This point is particularly important for Aboriginal communities.			X	This comment has been reviewed, and it is considered that the existing text is appropriate for a Safety Guide.
-	UK	Para 6.6	(d) The hazard from the non-radioactive components of the discharge may be more significant than those from the radioactive components and in these cases will normally determine the controls to be exercised over the discharge;	Of course this may also be the case for manmade radionuclides?			X	The comment is noted, but is difficult to address without a specific recommendation from the reviewer.
-	Canada	6.6 (g)	Consider revision below:. “While liquid discharges from onshore and offshore oil and gas installations are unlikely to lead to significant human exposure, there may be an impact on the environment needing an assessment and, if necessary control.”	Similar to offshore, onshore production performs cleaning of pipes containing elevated levels of radium. The water may also be used for irrigation purposes.			X	This comment has been reviewed, and it is considered that the existing text is appropriate, since releases from offshore installations will be diluted by the ocean which cannot necessarily be true for onshore releases.
	Japan	6.7/1 (p.40)	Add some examples of NORM facilities to this paragraph or as a footnote.	There is no definition of NORM facilities in GSR	X			

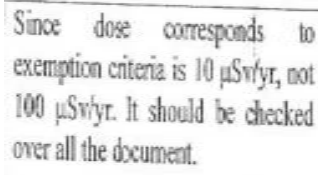
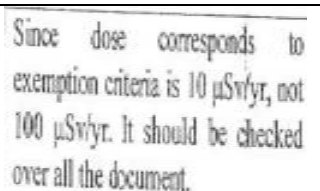
Relevance: ☐ 1 – Essentials ☒ 2 – Clarification ☐ 3 – Wording/Editorial

				Part 3 as well as DS442, hence some explanation including examples is useful to understand this term.				
	Australia	Paragraph 6.7	Change “Discharge routes need to be considered that are not relevant for other facilities:” to “ Relevant discharge routes need to be considered, including: ”	Most of the listed factors also affect the discharge of anthropogenic radionuclides. The most significant difference between NORM discharges and the discharge of anthropogenic radionuclides is due to the very long half-lives of the naturally occurring radionuclides.	X			
1	Germany	after 6.7	<p>Please add five new paragraphs 6.8 – 6.12 in Section 6:</p> <p><u>“6.8. The discharges into air and water from NORM industries vary considerably with respect to the radionuclides discharged, the characteristics of the receiving aquatic environment for liquid discharges, and the effective height of the stacks for aerial discharges. Radiation exposure of members of the public resulting from these discharges involves many exposure pathways, and the level of exposure per unit discharge rate depends on quite a number of site-specific conditions. Such site-specific conditions can result in very large differences in the dose per unit</u></p>	<p>Para 6.8: The introductory text is based on the information provided in Section 5.1 of Ref. [31] (specified at the left, see below). It should be included in DS442 for clarification and completion.</p> <p>Paras 6.9 – 6.11: Screening levels define the line between when no regulation of the discharge is necessary (with respect to public expo-</p>			X	<p>The proposal is too detailed for a Safety Guide and the concepts are included in other paragraphs. Some text of the proposed 6.9 was used, but the details on screening levels not.</p> <p>The publication of the European Commission is mentioned now in a footnote.</p>

			<p><u>discharge rate between different sites. Consequently, no simple and general relationship exists between the discharge rate and the effective dose to members of the public.”</u></p> <p><u>“6.9. A detailed site-specific analysis is not warranted when, on the basis of a generalised and conservative approach, it can be concluded that the discharges are of no radiological significance. Therefore, NORM discharge screening levels should be defined as estimates of the amount of activity discharged to the environment from a NORM facility, which, if not exceeded, mean that it is very unlikely that members of the public would receive an effective dose above a defined dose criterion. NORM discharge screening levels should be determined for each NORM release route (i.e. to atmosphere, rivers and/or the sea). Such screening levels should be calculated using cautious assumptions such that compliance with them would ensure compliance with the dose constraint.”</u></p> <p><u>“6.10. The derivation of discharge screening levels comprises the following steps:</u></p> <ol style="list-style-type: none"> <u>1. Definition of reference discharge situations,</u> <u>2. Selection of models, exposure pathways and parameter values,</u> <u>3. Derived doses per unit discharge rate,</u> <u>4. Dose criteria for screening levels,</u> <u>5. Discharge screening levels.</u> <p><u>The different steps are discussed in more detail in Ref. [31].”</u></p>	<p>sure) and further detailed assessment is necessary to determine if regulation is required. The proposed recommendations are based on the information provided in Section 5.1 of Ref. [31].</p> <p>Para 6.12: Sections 5.2 – 5.6 of Ref. [31] provide more comprehensive guidance on the derivation and use of screening levels for discharges from NORM industries.</p>				
--	--	--	---	--	--	--	--	--

			<p>“6.11. For discharges below the derived screening levels, there is most likely no need for a more detailed and site-specific radiological assessment of the discharge, while above the screening levels such a detailed analysis should be carried out.”</p> <p>“6.12. More comprehensive guidance on the derivation and use of screening levels for discharges, as well as on the assessment of radiation doses to members of the public due to discharges from NORM industries, is provided in Ref. [31].”</p> <p>The following publication of the European Commission, which is referred to in the proposed Paras 6.10 and 6.12, should be added to the list of references: “[31] EUROPEAN COMMISSION, Effluent and dose control from European Union NORM industries: Assessment of current situation and proposal for a harmonised Community approach, EC, Luxembourg (2003).”</p>					
	Turkey	7.	<p>There is no any emphasis of applicability of public dose constraints for decommissioning. Applicability of dose constraints for public during decommissioning should be presented and that, they may be different from operational ones, should also be mentioned in this part.</p>	<p>Since dose constraints have to be treated as guidance levels to establish discharge limits, dose constraints should also be set forth for decommissioning activities and they may be different from the operational ones for exposure pathways and radionuclides released may change during decommissioning.</p>			X	<p>This comment has been reviewed, and it is considered that the existing text is appropriate, since this is addressed in Paragraph 3.19.</p>
	UK	Para Section 7 Page	<p>The impact of shine from facilities undergoing decommissioning will be</p>				X	<p>The comment is noted, but is difficult to address</p>

		41	significant and should be explicitly addresses in section 7.					without a specific recommendation from the reviewer.
	Switzerland	7.1 / 2	... which should be considered <u>as</u> different practice <u>which is</u> subject to authorization ...	Editorial	X			
2	Germany	7.2	“It is typical for effluent discharges to vary through the different phases of decommissioning. For example, as decommissioning leads to a progressive removal of radioactive <u>sources hazards</u> , the radioactive discharges may be reduced.”	Clarification. The term ‘radioactive sources’ is defined in the IAEA Safety Glossary (2007 Edition) and in the Code of Conduct on the Safety and Security of Radioactive Sources. This definition differs from what is meant here.	X			
-	Switzerland	7.3 / 2	... that may not have been released <u>otherwise</u> ...	Editorial			X	This comment has been reviewed, and it is considered that the existing text is appropriate.
-	Switzerland	7.5, lit. c	The possibility that any contamination on site that resulted from incidents during operation may affect the discharges during <u>remediation decommissioning</u> .	Editorial	X			
-	UK	Section 7.5 (C) Page 41	We note that situations referred to in this section may need to be addressed early during decommissioning to minimise the possibility of migration.				X	The comment is noted, but is difficult to address without a specific recommendation from the reviewer.

-	Switzerland	8.5 / 4	The regulatory body should base the authorization <u>for future discharges on the results of the assessment and optimization study.</u>	Editorial	X			
-	Switzerland	8.6 / 7	The authorization should then <u>subsequently</u> be reviewed ...	Editorial	X			
-	Switzerland	I-5 / 3	... and informed <u>ed</u> decisions ...	Editorial	X			
	Turkey	I-8./Third line	“dot” is missing after the 1st sentence	Grammar correction	X			
-	Switzerland	I-11 / 1	... the a specific dose constraint ...	Editorial	X			
	Turkey	I-13. /forth line	2nd sentence should be corrected as “....which corresponds to and order of exemption criteria”.				X	This comment has been reviewed, and it is considered that the existing text is appropriate.
-	Switzerland	I-13 / 7	... <u>i.e.</u> manly the influence or not of other sources, <u>if relevant.</u>	Editorial	X			
	Turkey	Figure I-I	Instead of “dose higher than exemption criteria” “dose higher than and order of exemption criteria” should be preferred.		X	Figure was updated		
-	ENISS	I-16	In those cases, doses below 100 µSv per year can be used as the starting point to consider the specification of discharge limits including, when applicable, the optimization process (this is usually the case in most of the nuclear installations).	There is no gain in additional safety when doses are further minimized. This can be shown with a simple cost-benefit analysis. One has also take into	X			

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

				account that the assessed doses are based on more or less conservative calculations and the real doses may be one or more orders of magnitude lower for the majority of the exposed persons.				
-	Switzerland	I-20 / 4 I-24 / 9	Replace “arising” by “yield”	Editorial	X			
	Australia	Paragraph I-21	Delete “new” from 1st line. Add text to end of para: “ Consultation with interested parties including the public should be factored in to the optimization process. ”	Good practice would require that members of the public or their representatives should also be involved in optimisation discussions.	X X			
	Australia	Paragraph I-31	Change “Some regulatory bodies prefer dose because it is viewed as a more fundamental quantitative limit and one that underlies the objective of the system of limitation of discharges” to “ Some regulatory bodies prefer the use of dose limits because it is the total exposure scenario that determines the actual radiological impact and that underlies the objectives of the system of limitation of discharges. ”		X	Text modified		
	USA	I-35	Suggest adding a footnote to say:	Suggest adding infor-	X			

			Periodic review may need to be taken if there is reason to believe that the ratio of various nuclides in the grouping might change.	mation, because measurement of a radionuclide in a group may not give the proper indication of dose or totals of the group if there is a change in the ratio of the various radionuclides. This has been seen in nuclear reactors, where decontamination efforts and other factors have reduced some radionuclides, leaving other to be more important than previously estimated.				
	Czech Rep.	I-38/4	The basic interval over which compliance is expected to be shown is almost always one year, usually a calendar year, although a rolling 12 month period is also used. The advantage of the latter is that it is believed to permit closer supervision of the facility by the regulatory body, but it is administratively more cumbersome to implement. In some cases (e.g. concerning the NPP cycles longer than 1 year), the interval can be 18 months or 2 years.	In some cases, the process can be longer than 1 year, e.g. one NPP cycle can last up to 2 years. So it could be useful to mention that.	X	Text revised.		
-	Australia	Paragraphs I-39 to I-40	Suggest adding new paragraph I-41: “Consideration also needs to be given to setting discharge limits for those facilities where routine discharges are generally low but specific (routine) events can re-		X			

			sult in short-term discharges that exceed the routine discharge levels by a considerable amount without markedly affecting the long-term average (for example, changing the molybdenum generators in a technetium production facility).”					
-	ENISS	I-44	There is no standard period of validity; it may vary from two to three years up to five or more years. The usual period of periodic reviews for more complex facilities is ten years.	Periodic reviews of more complex facilities are common at intervals of ten years (see NS-R-3, rev.1 or SSG-25 or SSR-2/2)	X			
3	Germany	Ref. [15]	“INTERNATIONAL ATOMIC ENERGY AGENCY. Governmental, Legal and Regulatory Framework for Safety, IAEA Safety Standards Series No. GSR Part 1 Rev. 1 . IAEA, Vienna (2015) . (2010). (under revision DS462). ”	In the frame of the IAEA Action Plan on Nuclear Safety, GSR Part 1 was revised by amendment (DS462). The final version of DS462 has meanwhile been endorsed by the CSS (November 2014) and the Board of Governors (March 2015). Rev. 1 will be published this year.	X			
3	Germany	Ref. [17]	“INTERNATIONAL ATOMIC ENERGY AGENCY. Safety Assessment for Facilities and Activities, IAEA Safety Standards Series No. GSR Part 4 Rev. 1 , IAEA, Vienna (2015) . (2009) (under revision DS462). ”	In the frame of the IAEA Action Plan on Nuclear Safety, GSR Part 4 was revised by amendment (DS462). Rev. 1 will be published this year.	X			
3	Germany	Ref. [18]	“INTERNATIONAL ATOMIC ENERGY AGENCY, Licensing Process for Nuclear Installations, IAEA Safety Standards Series SSG-12, IAEA, Vienna (2010).”	In the list of references, SSG-12 inadvertently occurs twice: Ref. [5] and Ref. [18]. Delete [18] and replace the corresponding citation in Para 5.5 by [5].	X			

	UK	Refer- ences	Add RS-G 1.7 to references for the main text and for the Annex	The concepts of Exclusion, exemption and clearance must form part of any legislative process controlling discharges to the environment.	X			
3	Germany	Annex, I-7	... BEST AVAILABLE TECHNIQUES ...	Typo.	X			
	UK	Annex	I-7. A dose constraint is not the only tool used in optimization. For example the application of BEST AVAILABLE TECHNIQUES , best available techniques taking into consideration the cost and advantages, could similarly aid in ensuring that doses to the public are kept as low as reasonably achievable.		X			
	Japan	Page 48 Para I-8. /Line2-3	needs to be considered. For example,	A period after “considered” is missing.	X			
3	Germany	Annex, I-8	“When considering the contribution to the exposure of the public from other authorized sources <u>of radiation</u> , local and distant <u>as well as</u> and existing and planned practices needs to be considered. For example, for <u>a</u> nuclear installations, other nuclear installations <u>collocated</u> on the same site or discharging to the same water body (particularly rivers and small lakes) could be observed or assumed to contribute to the exposure of the representative person under consideration.”	Wording.	X			
3	Germany	Annex, I-9	1 st sentence: “Considering that the <u>dose</u> constraint is not only to consider other existing or planned	Wording.	X			

			sources ...” 2 nd sentence: “... once the protection is optimized with respect to each source, the resulting combination of doses does not exceed the dose limit.”	Grammar.	X			
3	Germany	Annex, I-10	2 nd sentence: “On the other hand, for facilities or activities located in <u>extremely</u> remote areas, e.g. a uranium mine, in an extremely remote area , the contribution from other local sources could generally be discarded ...”	Streamlining of text without loss of information.	X	Text revised.		
	UK	Annex I-10.	In the case of facilities or activities in an urban environment, e.g. hospitals or industrial applications, more than one source could be at ways assumed to contribute to the exposure of the representative person. On the other hand, for facilities or activities located in remote areas, e.g. a uranium mine in an extremely remote area, it may reasonably be assumed that there are no other contributing sources and the contribution from other local sources could generally be discarded and , consequently, a higher specific dose constraint could be set.	clarify	X			
3	Germany	Annex, I-11	1 st sentence: “In the case of a hospital discharging to the sewage, the a specific dose constraint value needs to be set to take account of the exposure conditions of the workers ...”	Editorial.	X			
	UK	Annex I-11.	In the case of a hospital discharging to the sewerage system	editorial	X			

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

			sewage, the a specific dose constraint value may needs to be set to take account of the exposure conditions of the workers at the sewage treatment works system used to collect and process liquid discharges, which are normally identified to define the representative person.					
3	Germany	Annex, I-12	1 st sentence: “... these may include using best available techniques as discussed, <u>possibly</u> in combination or not with a dose constraint.”	Wording.	X			
3	Germany	Annex, I-13	3 rd sentence: “Figure I-1 illustrates <u>s</u> that the specific dose constraint for a facility or activity could be higher or lower than the generic dose constraint, depending of different factors determining the exposure conditions at the location of the representative person, mainly the <u>possible</u> influence or not of other sources <u>of radiation</u> .”	Wording.	X	Text revised.		
	UK	Annex I-13	Figure I-1 illustrates that the specific dose constraint for a facility or activity could be higher or lower than the generic dose constraint, depending on of different factors determining the exposure conditions at the location of the representative person, mainly the influence or not of other sources.		X	Text revised.		
	UK	Fig I-1	Should exemption criteria dose be 10 uSv/a?		X	Figure was updated		
3	Germany	Fig. I-1 (p. 49)	Legend: “ <i>Relation between a generic and a specific dose constraints</i> .”	Grammar.	X			

	UK	Annex	Para I-8 - considered For		X			
3	Germany	Annex, I-14	1 st sentence: “Figure I-2 illustrates that once the specific dose constraint is specified, ...”	Grammar.	X			
	UK	Fig I-2	Should read specific or generic dose constraint. Also should 100 uSv/a be 10?			Figure was updated		
	UK	Annex	I-22. Consideration of management options includes the evaluation of requirements for design and operational features, storage and treatment, and prevention of spills. For new facilities, protection can be optimized through the design, and construction for the operational, and decommissioning stages of the facility	Strongly agree that ‘de-sign for decommissioning’ should be emphasized.			X	This comment has been reviewed, and it is considered that the existing text is appropriate, since decommissioning should be considered in facility design.
	UK	Annex	I-24. There are a number of social and economic factors that will influence the decision on the optimized level of discharge. In particular, Factors may include public perception, political awareness, and potential consequences are relevant and likely to be different for discharges from nuclear facilities than from non-nuclear facilities such as hospitals.	Suggest restrict the mention of factors to social and economic which are broad and allow for a range of issues such as effects on natural resources and businesses etc in line with ALARA principle. If examples need to be given then perhaps include public views, impacts on natural resources etc	X	Sentence deleted and text revised.		
3	Germany	Footnote No. 19 to I-26	“See OSPAR PARCOM Recommendation 91/4 of 20 June, 1991 On Radioactive Discharges (1991). Available from: http://www.ospar.org/v_ospar/strategy.asp?v0=5&lang=1 http://www.ospar.org/documents/dbase/decre	Please update the link to the OSPAR website. The provided link is no longer available.	X			

			cs/recommendations/pr91-04e.doc ”					
	UK	Annex	I-27. When properly specified, best available techniques is effectively a different but consistent approach to optimization that focuses on techniques and technology rather than impact.	Better to say something along the lines that they are complementary. Note that previously we have said that the use of BAT is a manifestation of the optimisation principle which is stated earlier in this draft.			X	The comment is noted, but is difficult to address without a specific recommendation from the reviewer.
3	Germany	Annex, I-28	“Within the context of IPPC, <u>the term ‘best available techniques’</u> is explained as follows: ...”	Editorial.				
	UK	Annex	I-28. Within the context of IPPC,	May also be useful to include the OSPAR definition?			X	This comment has been reviewed, and it is considered that the existing text is appropriate. See Paragraph I-26 for a discussion of BAT and the OSPAR convention.
	UK	Footnote 11	Information for information	Editorial	X			
3	Germany	Annex, I-33	3 rd sentence: “However, even in situations where a mixture of radionuclides is discharged, it is unusual to set limits on each individual radionuclide, because such a practice <u>is considered</u> will usually be cumbersome and unnecessary; in which case <u>instead</u> , one limit on total activity released may be used.”	To improve wording.	X			
3	Germany	Ref. [I-8]	“INTERNATIONAL ATOMIC ENERGY AGENCY, Setting authorized limits for <u>radioactive</u> discharges: practical issues to consider. <u>IAEA</u> TECDOC <u>Series No.</u> 1638, IAEA, Vienna (2010).”	Citation of the correct title of IAEA-TECDOC-1638 (compare with Ref. [25] on page 46).	X			
3	Germany	Ref.	“... 1992 OSPAR Convention for the Pro-	Please update the link to	X			

		[I-11]	tection of the Marine Environment of the North-East Atlantic (1992). Available from: http://www.ospar.org/eng/html/welcome.html http://www.ospar.org/ ”	the OSPAR website. The provided link is no longer available.				
	Russia	Comment no 1	NOTE: See comments from Russian Federation in attached pdf below.		X			
	Russia	Comment no 2	-		X	Text revised..		
	Russia	Comment no 3	-		X	Text revised..		
	Russia	Comment no 4	-		X	The text revised to be consistent with DS 427.		
	Russia	Comment no 5	-		X			
	Russia	Comment no 6	-		X			
	Russia	Comment no 7	-		X			
	Russia	Comment no 8	-		X			
	Russia	Comment no 9	-		X			
	Russia	Comment no 10	-		X (“limited to” used)			
	Russia	Comment no 11	-		X	Text revised..		
	Russia	Comment no 12	-		X			
	Russia	Comment no 13	-		X			
	India	3.3/8-9 lines	These dose limits represent the maximum acceptable dose to members of the public in planned exposures situations and include all the sources of radiation_excluding natural sources of radiation.	Clarity is brought precisely	X	Text revised.		
-	India	Annex 1-	Exemption criteria given as 100 uSv/a.	Paragraph 1.2 in the	X	Text revised to be		

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

		13: Figl-1 & 1-15: Fig 1-2		Schedule I in GSR Part 3 indicates Exemption crite- ria of 10 microSv/a.		consistent with DS 427.		
-	India	4.3/5.22/ 5.41/ 5.46	Exempt level shall be < 10 microSv/ y.		X	Text revised to be consistent with DS 427.		
-	India	5.96/5-7	Measurements may be less than limits of detection, may include contributions from other sources (such as other installations, past accidental releases or fallout from past nucle- ar weapons testing) or.....	Guidance for reporting of results when measure- ments are less than limits of detection may be de- tailed.			X	The comment is noted, but is diffi- cult to address without a specific recommendation from the reviewer.
-	India	1.3/1-2		Editorial		Text revised.		
-	India			Editorial	X			
-	India			Editorial	X			
-	India			Editorial	X			
-	India			Editorial	X			
-	India			Editorial	X			
-	India			Editorial	X			
-	India			Editorial	X			
-	India			Editorial	X	Text revised.		
-	India			Editorial	X			
-	India			Editorial			X	This comment has been reviewed, and it is consid- ered that the exist- ing text is appro- priate.
-	India			Editorial	X	Text revised.		
-	India			Editorial	X			
-	India			Editorial	X	Text revised.		

1

Form for Comments

Regulatory Control of Radioactive Discharges to the Environment (DS442)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Russia/Rostekhnadzor		Page 1 of 4 Date: June 30, 2015					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	4.1/4	"...; for example, releases of naturally occurring radioactive materials at its original levels) or where the radiological impact is below the criteria for exemption as established in [2]."	The right bracket is missing. As a result current draft statement implies that exemption is a part of exclusion process.				
2	5.11/3	"...is no longer required. However..."	Misprint. point is missing.				
3	5.14/1	"Authorization should then be applied..."	The term "licensing" should not be used in context of the document. More broad term "authorization" is preferable instead.				
4	5.22/3	"Therefore, dose constraints are likely to fall within the range of 0.01 – 1 mSv per year [7]."	Dose level considered as appropriate for exemption is 10 µSv per year according to Schedule 1 of GSR Part 3.				
5	5.25 (b)2	"...plants, other existing or..."	Misprint.				
COMMENTS BY REVIEWER				RESOLUTION			

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

CTP2

15 JUN 2015 10:58

TE1:84955321365

OT:POCTEXHA130P

OT:DMC

TE1:

22 JUN 2015 19:07 CTP2

Reviewer: Russia/Rostekhnadzor		Page 2 of 4 Date: June 30, 2015					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
6	5.26/3	"...constraints, for facilities or activities..."	Misprint.				
7	5.29/3	"... the radionuclides. In the case..."	Misprint.				
8	5.50/2	"...the average dose to the exposed group..."	Misprint.				
9	5.54/	"In order to make an effective..."	Misprint.				
10	5.56/1	Either "The use of generic assessments should be limited to..." or "Generic assessments should be used only for..."	Ambiguous statement.				
11	5.58/8	"...over-estimate the dose to the public..."	Too many "estimate" in a row.				
12	5.60/8	"...to avoid over-estimation."	Misprint.				
13	5.66	When determining the location and lifestyle habits of the representative person it should be ensured that adequate protection is provided for local populations. Taking into account	Currently, para 5.66 implies that dose to the representative person from "remote population" may exceed those for a representative person from the "local population". The only conceivable way is as follows:				

3

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Russia/Rostekhnadzor		Page 3 of 4 Date: June 30, 2015					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		the lifetime of a discharging facility, the location and lifestyle habits of the representative person should be specified with regard to the present and future environmental conditions, land use, spatial distribution of population, food production, distribution and consumption plus other relevant factors.	<p>- in 5.66 "population remote" means the population that is sufficiently remote from the facility so that foodstuff produced near the facility cannot be considered as locally produced.</p> <p>- "remote" means that due to substantial dilution of the plume on remote distances the only meaningful exposure pathway for a remote reference person is ingestion of food, which is non-locally produced for him; and</p> <p>- the consumed by the person foodstuff is produced in regions where other discharging facilities are located.</p> <p>Therefore, it would make the operator to take into account all the contributions from all products, which were</p>				

DT:DMC

TEH:

22 JUN 2015 19:08 CTP4

CTP4

15 JUN 2015 10:59

TEL:84955321365

DT:POCTEXH030P

4

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Russia/Rostekhnadzor		Page 4 of 4 Date: June 30, 2015					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			produced in remote locations with various (multiple) facilities located. This would imply that operator should conduct a country-wide research of foodstuff market. Cost of such a wide study will be high and reliability/accuracy of prediction/result will be low.				

DT: DMC

TEU:

22 JUN 2015 19:08 CTPS

CTPS

15 JUN 2015 10:59

TEN:84955321365

CTEXHADDP

Relevance: 1 – Essentials 2 – Clarification 3 – Wording/Editorial