

DS442 Regulatory control of Radioactive Discharges to the Environment

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer Country/Organization: Sweden, Swedish Radiation Safety Authority Date: October 31, 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1.1	However, some facilities and activities may generate a variety of gaseous and liquid effluents during their normal operation, containing minor amounts of radioactive residues that, owing to the low activity concentrations and high volumes, would be technically difficult and or extremely costly to avoid. The optimization of radiation protection may lead to the conclusion that such releases are deemed to be justified from a radiological point of view considering the low doses and high costs involved	This para. refers to the optimization of radiation protection. We prefer that this is more clearly pointed out.	Yes			
2	1.5	“Accordingly” change to “According”	Editorial	Yes			
3	1.11	The scope of this Safety Guide is limited to discharges to the atmosphere of airborne effluents (gases and aerosols) or discharges to surface waters of liquid effluents from activities and facilities during normal operations in planned exposure situations ⁵ .	Editorial	Yes			
4	2.2 & 2.5	Remove from one of the paras; the reference to [1] about the fundamental safety objective is to protect people and the environment from harmful effects of ionizing radiation	The text is almost the same	Yes			
5	2.6	...generally aims to provide for appropriate protection	Editorial	Yes			
6	2.8	Proposed new text. The system of justification, optimization and dose limitation is applied in accordance with the BSS.	It is not necessary to copy text from the BSS it is better just to make a reference.	Yes			
7	2.9-2.16 and	Consider to delete all para.	Just a reference to the BSS - unnecessary	Yes			

8	2.17-2.18	Delete para.	Just a reference to the BSS - unnecessary	Yes			
9	2.19-2.25	Delete para.	Just a reference to the BSS – unnecessary (and for 2.25 GSR Part 4.)	Yes			
10	3.1	Last sentence: ... are described in the BSS	See comment 6	Yes			
11	3.4	remove “relevant”...dose limits for members... These dose limits represent the maximum dose to members of the public from all planned exposure situations. The discharge limits for a certain planned exposure situation should be set accordingly.	Partly editorial and partly a clarification.	Yes			
12	Figure 1	Conduct an authorization process	Editorial	Yes			
13	4.3	“representative person”	Para. Is a reference to BSS – if this para is not deleted “representative person” has to be explained.	Yes			
14	5.3	“simple facilities or activities, like hospitals...” Remove “hospitals”	Hospitals are not always to be seen as “simple” facilities and the authorization process are not always straight forward. Not to be compared will small laboratories.	Yes			
15	5.21	Delete the second sentence.	The concept of <i>representative person</i> is used to show compliance with the dose constraint or dose limit. It is a part of a methodology.	Yes			
16	5.23(d)	Delete (d)	The choice of dose constraint is based on the need for protection of members of the public not on the opinion of the applicant.	Yes			
17	5.24-5.25	Delete alternatively rewrite so it refers to the optimization below a set dose constraint.	Misleading. The para. seem to mix the optimization process which starts below the dose constraint, with the actual establishment of the dose constraint itself.	Yes	Will be revised		
18	5.26	Consider delete the two last to sentences.	See comment 13 on para5.21	Yes			
19	5.27	Remove the end of para. Starting with “... with optimization used to ensure doses...”	See comment 15 on 5.24-5.25	Yes			

20	5.28	Remove “ representative person”	See comment 13	Yes			
21	5.30	Replace “ representative person” with “ to members of the public”	See comment 13	Yes			
22	5.32	Replace “ representative person” with “ to members of the public”	See comment 13	Yes			
23	5.52	Proposed new text “ Collective dose is the average dose in a specific group of people multiplied with the number of people in that group”	The definition was not correct.		Will be considered		
24	5.59	Delate para. or delete “hospitals”	Using a generic assessment the doses to the public (e.g. sewage workers) as a result from discharges from hospitals may be high (20 mSv/year)	Yes	Hospitals will be deleted.		
25	5.92	Delate “hospitals”	See e.g. comment 24 on 5.59.	Yes			

TITLE DPP on DS 442 “Regulatory Control of Radioactive Discharges to the Environment”.

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page.1 of 5 Country/Organization: Alvarez D, Curti A; Lee Gonzales H. Argentina/Nuclear Regulatory Authority Date: November 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	2.22. “Para. 3.132 of the BSS [2] require registrants and licensees in applying, for and authorization for discharges...etc.”	Delete	Wording. Redundant with previous paragraph 2.17	Yes			
2	5.5 This information should be sufficient to allow the regulatory body to form an opinion on the acceptability of the practice about the suitability of the optimization criteria, including dose constraint compliance.	5.5 This information should be sufficient to allow the regulatory body to form an opinion <i>about the suitability of the optimization criteria, including dose constraint compliance.</i>	The regulatory body has to have an opinion about the acceptability of the practice before the beginning of the construction.	Yes			
3	5.16 Page 18 <i>Figure 3: Steps to authorize radioactive discharge limit, indicating those responsible.</i>	The legend in the last part of the diagram should be ¿are models and assumption valid and doses below optimized levels constraints?	The optimized discharged should be traduced in optimized doses which in turn shall be below the dose constraint		To be considered		

4	<p>5.23 Page 20 (c) Dose contributions from other authorized practices or from possible future authorized practices; for example, account should be taken of doses from possible future sources and practices, for example, in the case of a nuclear reactor, other nuclear reactors to be possible built on the same site.</p>	<p>5.23 Page 20 (c) Dose contributions from other authorized practices or from possible future authorized practices; for example, in the case of a nuclear reactor, other nuclear reactors to be possible built on the same site.</p>	<p>Wording (avoid redundancy)</p>	<p>Yes</p>			
5	<p>5.28. <i>When</i> there are several facilities on one site (e.g. in the case of multiple nuclear power plants) or along a river, each with its separate gaseous and liquid discharge outlets, the government or regulatory body should decide whether a dose constraint should be applied to the total dose to the most exposed representative or a (lower) dose constraint should be applied to any particular facility.</p>	<p>5.28. <i>When</i> there are several facilities on one site (e.g. in the case of multiple nuclear power plants in one site) or along a river), each with its separate gaseous and liquid discharge outlets, the government or regulatory body should decide whether a dose constraint should be applied to the total dose to the most exposed representative and or a (lower) dose constraint should be applied to any particular facility during the design stage.</p>	<ul style="list-style-type: none"> - Suggestion: Include the mention of “along a river” in the examples, because is just a particularly case among other possibilities, for instance a lake. - Include “and” (“and/or a (lower) dose constraint....”), because in same countries, including Argentina, both kind of dose constraints are applied together. - It is important to highlight the prospective use of constraint, associated to optimization <u>in the design stage</u> of the radioactive discharge system of a particular facility. 		<p>To be considered</p>		

6	5.48 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, for NPPs or similar installations).	5.48 Nevertheless, the regulatory body should determine the type of installation and/or conditions 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, for NPPs or similar installations, where relevant values of collective doses and/or occupational exposures could be expected to occur).	To consider other than the public dose factors that could be relevant for the need of a formal optimization process.		To be considered		
7	5.57. In order to make and effective use of assessment resources, a structured iterative approach should be used for assessing doses to the representative person group.	5.57. In order to make and effective use of assessment resources, a structured iterative approach should be used for assessing doses to the representative person group .	Delete "group", because is appropriate refers to representative person, but not to representative person group.	Yes			
8	5.63. The estimated effective doses for the representative person should be based on the reference person model [17, 18]. However, the habits (e.g., consumption of foodstuffs, location,	5.63. The estimated effective doses for the representative person should be based on the reference person model [17, 18]. However, the habits (e.g., consumption of foodstuffs, location , usage of local resources) adopted	Delete "location", because the location of the (hypothetical) representative person or critical group is not a habit and to be consistent with 5.70, where location and lifestyle habits are separate.	Yes			

	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 highly exposed.	to characterize the representative person should be typical habits or characteristics of a small number of individuals representative of those most highly exposed.					
9	5.88. From the specific dose constraint a process of optimization as describe in Section CONSIDERATION OF OPTIMIZATION OF PROTECTION above should be applied by the applicant and reviewed by the regulatory body, in order to define the level of dose corresponding to a discharge level optimized from the protection of the public point of view. This level should be below or equal to the specific constraint, depending on the results of the	5.88. From the specific dose constraint a process of optimization as describe in Section CONSIDERATION OF PROTECTION above should be applied by the applicant and reviewed by the regulatory body, in order to define the level of dose corresponding to a discharge level optimized from the protection of the public point of view. This level should be below or equal to the specific constraint, depending on the results of the optimization.	The optimized level of discharge should be below or equal to the specific constraint. If not the process of optimization should to be reviewed.	Yes			

	optimization.						
10	<p>Page 52, A-18 For larger facilities that may discharge a variety of radionuclides, limits are generally imposed on groups of nuclides that share relevant characteristics, although limits may also be imposed on specific radionuclides that are deemed to be of special significance.</p>	<p>Page 52, A-18 For larger facilities that may discharge a variety of radionuclides, limits are generally imposed on groups of nuclides that share relevant characteristics, although limits may also be imposed on specific radionuclides that are deemed to be of special significance (for instance tritium in HWR reactors).</p>	<p>To reflect the relevance of tritium in term of doses, especially for HWR reactors discharges.</p>	Yes			

DS442 Regulatory Control of Radioactive Discharges to the Environment

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer Country/Organization: Republic of Korea / Korea Institute of Nuclear Safety Date: October 17, 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	§1.7 & REFERENCES	<i>(IAEA Safety Guide No. NS-G-2.7(2002), which is a sister Safety Guide of Ref. [7], i.e. NS-G-1.13 for design and deals with operational discharge issues at the NPPs, should be referred to in DS422, more specifically in Para. 1.7.)</i>	In Section 4 and Paras. 6.13-6.14, of NS-G-2.7(2002) titled "Radiation Protection and Radioactive Waste Management in the Operation of Nuclear Power Plants", we can find specific guidance and advice on the regulatory control of discharges at NPPs.	Yes			
2	§4.1	[...] natural naturally occurring radioactive materials [...]	To keep consistency with the IAEA Safety Glossary (2007)	Yes			
3	§5.29	<i>(The basis or source of information on the quantitative values of the annual dose constraint for nuclear fuel cycle facilities described in Para. 5.29 should be specified.)</i> [...] Based on the experience in States this range for the dose constraint for nuclear fuel cycle facilities (including reactors) could be of annual doses of between <u>100 and 800 µSv</u> . [...]	The range of annual doses between 100 and 800 µSv as shown in Para. 5.29 is not compatible with TABLE II of WS-G-2.3 (2000) which shows the range of dose constraints between 80 and 300 µSv. It is recommended to check the source of information again and specify it in the text as a reference.	Yes	This is a proposal and will be discussed during WASSC/RASSC/NUSSC meetings		
4	§5.91	Simple installations like hospitals or small research laboratories may not need a permanent environmental monitoring programme but a single monitoring campaign close to the installation <u>prior to and</u> at the	For simple installations such as small hospitals or laboratories using short lived radionuclides, environmental monitoring is not usually required (See Para. 2.9 of RS-G-1.8).	Yes			

		beginning of operations should <u>may</u> be considered by the regulator as a requisite to verify compliance.	If the environmental monitoring is to be conducted to verify compliance, monitoring before commissioning should be also considered in order to get the baseline data.				
5	§A.14 to §A.16	<p>A-14. There are a number of ways in which authorized discharge limits can be set based on limiting either dose from <u>or</u> quantity <u>or concentration</u> of radioactive material discharged from the facility. In most cases, the choice is a matter of preference on the part of the regulatory body, as well as the manner in which the regulatory body requires licensees to demonstrate compliance.</p> <p>A-15. Some regulatory bodies prefer dose because it is viewed as a more fundamental <u>quantitative limit</u> quantity and one that underlies the system of limitation of discharges. Setting limits in terms of quantities <u>or concentrations</u> discharged, on the other hand, is viewed by other regulatory bodies to reflect more closely the quantity <u>or concentration</u> that is to be controlled and measured, and is therefore more closely connected to the actions that the registrant or licensee must take to control discharges.</p> <p>A-16. Expressing limits in terms of dose or quantity <u>or concentration</u> of radioactive material discharged does</p>	To take into account the actual practices of some Member States including Korea: setting the discharge limits based on concentrations of radioactive materials at the discharge point or at the site boundary	Yes			

		not represent a fundamental difference, but rather one of preference, because dose and quantity or concentration are directly proportional for any given site, and one can be converted to the other without difficulty. However, while a quantity or concentration of radioactive material is a measurable magnitude, dose to members of the public is always based on an assessment [I-1].					
6	§A.18	For example, airborne discharges from nuclear power plants are often grouped as follows: noble gases, halogens or iodine isotopes, and particulates, tritium, and C-14 . This grouping reflects dosimetric considerations: noble gases result in external exposure to the whole body, iodine isotopes result in thyroid doses, and particulates usually present a potential hazard of inhalation or ingestion to all of the organs and tissues of the body. They also reflect different ways of sampling and quantifying the discharges. [...]	Tritium and C-14 are typical radionuclides on which nuclide-specific discharge limits are usually imposed and for which different sampling/measuring methods are applied.	Yes			
7	§2.22	(e) to ; “submit to the regulatory body the findings of (a) – (d) as an input to the establishment by the regulatory body [...] of authorized limits on discharges and conditions for their implementation”.	Typos and other miscellaneous errors	Yes			
8	§5.14	[...] A graded approach should be used when considering radioactive discharges. ;		Yes			
9	§5.113	[...] scientific bodies and		Yes			

		environmental groups (see Refs. [11] and [2]).					
10	§5.116	As noted in paragraph 2.9 2.20 there is a requirement [...]		Yes			

Draft Safety Guide DS442 *Regulatory Control of Radioactive Discharges to the Environment* (October 2014 (draft 3))
ENISS Comments

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: ENISS		Page: 1 of 6					
Country/Organization: ENISS		Date: 12 11 2014					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	<p>This guide is revision of SS WS-s-2.3 from 2000 which superseded SS77 from 1986. The scope has broadened to include also hospitals and uranium mining and milling. The regulatory control of releases from nuclear power stations (NPPs) as well as from the mining industry is a well-established practice.</p> <p>The Introduction is somewhat confusing and needs editorial work. The justification for the releases to occur is not properly addressed from an ethical point of view and ought to be amended (see previous guides). The risks involved in comparisons to “natural radioactivity” ought to be addressed for some facilities.</p> <p>The document in general does not provide much additional guideline, but rather quotes the BSS standards and the ICRP recommendations.</p>		Yes			
2	Chapter 1 general	<p>The draft document repeatedly discusses the problem with occupational and public exposures when giving guidance on the discharge control. It should be made clearer that balancing the doses is a requirement of the optimization process, which is a continuous process for the NPPs. The venting to the atmosphere, the waste treatment etc., are processes that may cause undue exposures to the workers. The differing between public and occupational exposures regarding the dose constraint may cause communication problems in society and should therefore be avoided. The opposite relates to the practical optimization.</p>		Yes	Will be considered.		

3	1.1	... containing minor amounts of radioactive residues, that owing to the low activity concentrations and high volumes involved, would be, technically difficult to avoid or may have and an excessive and unjustified cost from the radiological protection perspective. The doses in such conditions are very low.	Need to state that the doses are also expected to be very low or marginal upon the releases.	Yes			
4	1.9	The objective of this Safety Guide is to provide governments, regulatory bodies, applicants, registrants and licensees, as defined in the BSS, with a structured approach to limit <u>control</u> the radiation exposures to the public resulting from discharges	As this is the title of the document and according to 1.12.	Yes			
5	1.11	The scope of this Safety Guide is limited to discharges to the atmosphere of airborne (gases and aerosols) or discharges to surface waters of liquid effluents from activities and facilities during normal operations in planned exposure situations ⁵ . Disposal of solid radioactive waste, injection of liquids containing radioactive materials in underground water , and the releases to the environment arising from accidents are not addressed in this Safety Guide.	Injection of liquids containing radioactive materials in underground water should be considered as a release and therefore should be included in the scope of the safety guide.	No			This is arguable considering the current approaches for waste management in the Safety Standards.
6	1.12	This Safety Guide provides guidance on a procedure to establish the regulatory control of the discharges in connection with an authorization process. Wider aspects of the authorization process of activities and	Difficult to understand what is the guidance for	Yes			

		facilities are not considered. The authorization of discharges from new and modified facilities together with the review of established discharge authorizations are considered.					
7	Chapter 3 general	The title needs to be changed accordingly to <u>basis of discharge control</u> .	Several principles related to "controlled release" are not addressed here (radioactive waste for instance) thus the title need to be changed. The chapter seems to be copy paste of the BSS requirement. More valuable guidance should be provided.		Will be considered		
8	4.2 Figure 1	Delete the figure or change it to a more helpful one.	It is such simple logic scheme that it is not worth mentioning here and does not provide any additional information. This figure should be deleted or replace by a more useful one.	No/Yes			The idea was to use the same figures than WS-G-2.3 but more simplified (and separated in 2 figures). It could be deleted or improved.
9	5.4 figure 2	The title of figure 2 should be renamed: <u>Example of</u> stages in the lifetime of a facility and the timing when the control of discharges should be considered	Normally the design of a nuclear facility (NPP or disposal) is known before the siting. Provisional discharge limits are also established before the construction license is granted and it is a part of the license application	Yes			

			process. Some minor changes can be made during the operation license application or in the facility modernization process.				
10	5.7	During the operation phase the discharges <u>authorization, monitoring and control programmes</u> should be reviewed, as part of the periodic safety review.	The PSR does not mean issuing a new authorization by the authorities, at least not in all countries.	No			Discharge limits can be reviewed (down or up) subject to an assessment and justification and a new discharge authorization can be issued.
11	5.10	When an activity or facility is released from regulatory control after decommissioning, normally the radiological exposure scenario implies that a discharge authorization is no longer required, e.g. the releases to the environment after decommissioning are effectively zero. However some practices like mining or milling of uranium, after decommissioning could need a certain form of discharge authorization and the associated regulatory control. For these situations, the regulatory body should define <u>this discharge authorization</u> and the necessary monitoring programme on a case-by-case basis.	If the site is released from the regulatory control there is no authorization possible. There might however be the monitoring programme continued, but then it should be the new owner of the site or the state who is responsible, as there is no licensee any more.	Yes	However, some comments were received during drafting by international experts that some activities after decommissioning could still need some control with respect to environmental releases (for instance mining or milling). This should be further discussed.		
12	5.21	Like the dose limit, for public exposure, it relates to the dose to the	The last part of this sentence is incorrect.	Yes			

		representative person. <u>For this purpose the concept of representative person should be used.</u>	Representative person is used for showing compliance i.e. part of the methodology.				
13	5.23	5.23. ... (a) The characteristics of the source and of the practice that are of relevance for public exposure, for example the amount and types of radionuclides, the physical properties and chemical forms and the discharge pathways. (b) Good practice in the operation of similar sources; for example experience from well managed operations in other comparable installations should also be taken into account (c) Dose contributions from other authorized practices or from possible future authorized practices <u>on the same site</u> ; for example, account should be taken of doses from possible future sources and practices, for example, in the case of a nuclear reactor, other nuclear reactors to be possible built on the same site.	These parameters are used to establish authorized discharge levels and not dose constraints In case of NPPs the “site” is the source to which the constraint applies (see ICRP). It should be recognized that for the public, the “cause” of a dose is not important but the level of the dose i.e. it is the total discharges from the site that is relevant. The Site is a “source”, i.e. a geographic site.	Yes	(a) deletion The rest will be considered.		
14	5.24	There is a final choice of the dose constraint should have regard for the need for flexibility in the process of optimizing protection for different competing exposure situations, for	The flexibility is something to consider in the optimization by the operators but not on setting dose constraint. They are	Yes			

		example, for the trade-offs between public exposure and occupational exposure.	not intended to change periodically. It is the site that allows for the flexibility, not the dose constraint.				
15	5.26	Thus, environmental modelling should be used to demonstrate that the total radiation dose to the more exposed of the representative persons will be less than the dose constraint.	There are no “more exposed representative persons”.	Yes			
16	5.73	In granting an authorization, the regulatory body should establish or approve operational limits and conditions relating to public exposure, including authorized limits for discharges.		Yes			

Draft Safety Guide DS442 “Regulatory Control of Radioactive Discharges to the Environment” (Draft 3 dated October 2014)
Status: STEP 7 – First review of the draft safety standard by the SSCs

Note: Blue parts are those to be added in the text. Red parts are those to be deleted in the text.

COMMENTS BY REVIEWER					RESOLUTION			
Reviewer: Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) (with comments of GRS) Country/Organization: Germany					Page 1 of 16 Date: 2014-11-10			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3	1	1.4	1 st sentence: “The term ‘discharge’ is defined in [11] [2] and is used to refer to the on-going or anticipated authorized releases of gaseous, aerosol or liquid radioactive material to the environment ...”	Wrong reference is cited. The term ‘discharge’ is defined in the IAEA Safety Glossary (2007 Edition), but not in GSR Part 3.	Yes			
2	2	1.7	“This Safety Guide ... takes account of the advice given in a number of relevant Safety Guides [3, 4, 5, 6, 7, 8, 26] and with the experience from IAEA Member States.” Please add the Safety Guide NS-G-2.7 to the list of references: “ [26] INTERNATIONAL ATOMIC ENERGY AGENCY. Radiation Protection and Radioactive Waste Management in the Operation of Nuclear Power Plants. IAEA Safety Standards Series No. NS-G-2.7, IAEA, Vienna, 2002. ”	The DPP for DS442 lists the Safety Guide NS-G-2.7 as an interface document. In fact, Paras 4.45–4.55, 6.13–6.14, and Annex II of NS-G-2.7 provide specific guidance and recommendations on the regulatory control of discharges of radioactive materials from NPPs. Therefore, NS-G-2.7 should be added to the list of references.	Yes			
3	3	1.13	1 st sentence: “This Safety Guide addresses the derivation of authorized operational limits for discharges, ...”	Editorial.	Yes			

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

			2 nd sentence: “An important input into the process of controlling discharges should be the prospective assessment of the level of protection of public and the environment against the harmful effects of ionizing radiation.”	Slight modification of wording to be in line with GSR Part 3 and SF-1.				
2	4	1.14	“The facilities and activities considered cover a wide range of radioactive sources from, for example, those used in the general industry, those used in medicine and research to nuclear reactors and reprocessing plants. It This Safety Guide also covers the controllable discharges which may result from the during uranium mining and milling of ores for the extraction of uranium or thorium . Consideration is also given to the discharge of naturally occurring radioactive material (NORM) from facilities and activities .”	In the present text of the 2 nd sentence, the personal pronoun ‘it’ does not relate to a subject. With respect to discharges from mining, milling and mineral processing, ensure consistency with the information provided in Para 6.1 as well as with the Draft Safety Guide DS459 “Management of Radioactive Residues from Mining, Mineral Processing, and other NORM related Activities” (revision of WS-G-1.2). The DPP for DS442 lists the Safety Guide WS-G-1.2 as an interface document.	Yes			
3	5	2.16 (a)	“... determination of the representative person.”	Editorial (missing semicolon).	Yes			
3	6	after 2.19	Headline of subsection: “ TRANS NS BOUNDARY IMPACTS”	Editorial.	Yes			
3	7	2.22	Numeration of bullets (a) to (e) should be drafted line by line: “Para. 3.132 of the BSS [2] requires registrants and licensees in applying ; for an d authorization for discharges, as appropri-	Editorial correction to be in line with the format of comparable paragraphs (e.g. 2.17 and 2.18), and with the aim to improve the	Yes			

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

			ate ²² – i.e. consistent with a graded approach – ²² : (a) ... (b) ... (c) ... (d) ... (e) ...”	readability of the entire statement.				
3	8	2.25	1 st sentence: “The specific requirements relating to a graded approach are given in GSR Part 1, GSR Part 3 and GSR Part 4 [14], [2] and [15] [14, 2, 15].”	Uniform citation of references throughout the document.	Yes			
3	9	Section 3	Proposed new sequence of subsections with associated headlines: JUSTIFICATION (Paras 3.2 – 3.3) OPTIMIZATION (Paras 3.5 – 3.7) DOSE LIMITATION (Para 3.4)	For the sake of consistency, please use the same sequence of headlines as in the related requirements in GSR Part 3: <ul style="list-style-type: none"> • Requirement 10: Justification of practices; • Requirement 11: Optimization of protection and safety; • Requirement 12: Dose limits. 	Yes	The order in ICRP and BSS is as in the comment. However, the logic in setting discharge limits is: you have a dose limit, you set a constraint, you optimize, you reach to the discharge limit. I will revise the text.		
3	10	3.4	2 nd sentence: “These dose limits represent the maximum dose that should be applied to control the radiological impact to <u>members of the public discharges</u> when setting discharge limits.”	Modify wording to be more clear.	Yes			
3	11	4.1	1 st sentence: “... releases of naturally occurring radioactive materials at its original levels ...”	Grammar.	Yes			
2	12	4.3	“ <u>Para I.2 of Schedule I in the BSS</u> [2] indicates that an effective dose of the order of 10 µSv in a year received under	Include full citation in order to specify the place in the BSS where the dose	Yes	However, some reviewers prefer less citations (less quotations) and just indicating the refer-		

			all reasonably foreseeable circumstances would imply no need of an authorization. This dose criterion should be applied to the representative person. To take into account low probability scenarios, a different criterion could be used, namely that the effective dose expected to be incurred by any individual for such low probability scenarios does not exceed 1 mSv in a year. ”	<p>critereon for exemption of a practice from regulatory control is defined.</p> <p>For completeness, please add the relevant dose criterion for low probability scenarios specified in the same paragraph of GSR Part 3.</p>	This addition will be considered	ences. We will discuss this in further revisions.		
3	13	5.1	“... at different stages of the lifetime of a facility or the development of an activity.”	Wording adapted to be in line with the terminology used elsewhere in this document (see Paras 3.6, 5.2, 5.4, 5.41 and 5.70).	Yes			
3	14	5.4	2 nd sentence: “Figure 2 describes schematically the stages in the lifetime ...”	Grammar.	Yes			
2	15	5.6	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 Paras 5.14–5.18. ”	Please refer to the relevant paragraphs, in order to be more specific and to avoid misunderstanding. Current text suggests that Section 6 is referred to.	Yes			
3	16	5.16 (d)	“... (this may involve ... a more detailed site-specific study).”	Editorial (missing hyphen).	Yes			
3	17	5.16	Last sentence: “Figure 3 illustrates the process to authorize discharge limits ...”	Grammar.	Yes			
3	18	5.18	Last sentence: “... in order to reach to an optimum solution from the overall radiation protection point of view.”	Editorial.	Yes			
3	19	5.23 (c)	“... in the case of a nuclear reactor, other nuclear reactors to be possibly built on the same site.”	Grammar.	Yes			

3	20	5.25	<p>“The selection of the value for the dose constraint should consider: <u>(a)</u> the practicability of reducing or preventing the exposure; <u>(b)</u> the expected benefits of the practice to individuals and society; <u>(c)</u> other societal considerations relating to the practice; <u>and (d)</u> national or regional factors, together with a consideration of international guidance and good practice elsewhere.”</p>	<p>Include consecutive numbering in order to improve structuring of the factors that should be considered when setting the value for the dose constraint (compare, e.g., with Para 5.12).</p>	Yes	<p>The bullets will be revised due to this and other comments received.</p>		
1	21	5.29	<p>“A generic upper value for a dose constraint should be defined by the government or the regulatory body for different practices. ... Considering the need for flexibility in the process of optimization, the use of a range is advisable. Based on the experience in States, this range for the dose constraint for nuclear fuel cycle facilities (including reactors) could be of annual doses of between 100 and 800 <u>300</u> μSv. Other practices could have other ranges of generic dose constraints.”</p>	<p>Note that the generic upper value in DS442 (800 μSv) is considerably higher than the one recommended in the existing Safety Guide WS-G-2.3 (300 μSv). This calls for justification. If any new data or sources of information on the applied values of dose constraints are available, they should be included or referred to in DS442.</p> <p>Table II of the Appendix in WS-G-2.3 summarizes the dose constraints for nuclear fuel cycle facilities (including reactors) used in various Member States. There is a relatively narrow range of annual doses of between 100 and 300 μSv. In line with these values, Para A.9 of the Appendix concludes that</p> <p>“... on the basis of a re-view of the dose con-</p>	Yes	<p>This new value was suggested during drafting by international experts. It is a proposal to be discussed in next WASSC/RASSC/NUSS C meeting.</p>		

			<p><i>straints generally in use today in various countries (Table II), 300 μSv committed in a year is suggested as a default value for a source related dose constraint. This default value takes account of the possibility that other facilities discharging radionuclides may be built nearby in the future, e.g. the development of a reactor park, and that other local sources may contribute to the dose committed to a member of the public.”</i></p> <p>Furthermore, the ICRP Publication 77 states that “<i>to allow for exposures to multiple sources, the maximum value of the constraint used in optimization of protection for a single source should be less than 1 mSv in a year. A value of no more than about 0.3 mSv in a year would be appropriate.</i>”</p> <p>The Annex in IAEA-TECDOC-1638 (Ref. [9]) which summarizes the latest experiences in various States, does not contain any indication that would justify an increase of the generic upper value of dose</p>				
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				constraint for nuclear fuel cycle facilities to 800 $\mu\text{Sv/a}$.				
2	22	5.35	“In the case of discharges to the atmosphere, consideration should be given to the meteorological data at or close to the proposed site and possible deposition of radioactive material on land and subsequent transfer to crops and animals as well as on standing water bodies and subsequent uses of water .”	The proposed insertion considers the deposition of radioactive material at the surface of stagnant inland waters due to discharges of radioactive material to the atmosphere.	Yes			
3	23	5.37	“Pre-operational studies should also be carried out to determine the existing levels of radiation in the area surrounding the facility prior to operation ...”	Missing word.	Yes			
2	24	5.39	“The characterization of the radiation exposure pathways should take account whether discharges are to the air or water, and in the case of liquid discharges, whether the discharge will be to a marine, estuarine or freshwater environment sea or fresh water (lake or river) . For hospitals and research laboratories, there may also be discharges of radionuclides to the sewerage system . The relative importance of different exposure pathways ...”	Ensuring consistency with Para 5.19 of the Draft Safety Guide DS427 (Ref. [6]).	Yes			
3	25	5.48	Last sentence: “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, for NPPs or similar other complex installations).”	Wording adapted to be in line with the terminology used elsewhere in this document (see Paras 5.4, 5.14, 5.60, 5.73 and 5.75).	Yes			
2	26	5.50	2 nd sentence: “Concepts such as best available technol-	It is proposed to split Ref. [25] into two separate ref-	Yes			

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

			<p>ogy¹³ (or best available techniques) are used in some States [24] and under certain international frameworks [25, 27] and in other industries for controlling pollutants generally; an adequate use of best available techniques corresponds to optimization and demonstration of best available techniques would demonstrate optimization.”</p> <p>Please assign a new footnote No. 13 to the term ‘best available technology’ with the following text of the footnote: “¹³ The term ‘best available technology’ means the latest stage of development (state of the art) of processes, facilities or methods of operation which indicate the practical suitability of a particular measure for limiting discharges, emissions and waste.””</p>	<p>erences. More details are provided in our related comment on Ref. [25].</p> <p>A short explanation of the term ‘best available technology’ should be provided in a footnote because the term is not defined in the IAEA Safety Glossary (2007 Edition). The proposed text is taken from Appendix 1 of the 1992 OSPAR Convention (Ref. [25]). A similar definition is provided in the Directive 2008/1/EC (Ref. [27]).</p>				
3	27	5.51	<p>“The estimation of collective doses resulting from different options or alternatives ... and their direct comparison is can be another parameter which could be to included in the optimization process.”</p>	Wording.	Yes			
3	28	5.52	<p>2nd sentence: “When estimating collective doses to the public, care should be taken to avoid inappropriate aggregation of, for example, very low individual doses over extended time periods and wide geographical regions, <u>i.e.</u> limiting conditions should be set.”</p>	Wording.	Yes			
2	29	5.54	<p>“The establishment of an authorization of discharges should take into account the results of a previous assessment of the radiological environmental impacts, <u>com-</u></p>	<p>1st sentence: Insertion to be in line with Para 3.9 (e) of GSR Part 3.</p>	Yes	However, NG-T-3.11 is not a Safety Standard and we can include this reference only as a		

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

			<p><u>mensurate with the radiation risks associated with the facility or activity</u> [2]. [6] presents Guidance on radiological impact assessment which should be used as the initial basis in the process of setting discharge limits <u>is presented in [6] and [28]. ...</u>”</p> <p>Add Ref. [28] to the list of references: “[28] <u>INTERNATIONAL ATOMIC ENERGY AGENCY. Managing Environmental Impact Assessment for Construction and Operation in New Nuclear Power Programmes. IAEA Nuclear Energy Series No. NG-T-3.11, IAEA, Vienna, 2014.</u>”</p>	<p>2nd sentence: Environmental impact assessment is described in more detail in the Nuclear Energy Series publication NG-T-3.11 which has been published recently. For the sake of completion, please include a reference to this publication.</p>		<p>source of useful information, not as a recommendation.</p>		
3	30	5.60	<p>1st sentence: “A generic approach also may be used to estimate doses to the representative person at the early stages in the <u>lifetime</u> of a complex installations (see Fig 2), ...”</p>	<p>Wording adapted to be in line with the terminology used elsewhere in this document (see Paras 3.6, 5.2, 5.4, 5.41 and 5.70).</p>	Yes			
2	31	5.66	<p>Last sentence: “The possible accumulation of long-lived radionuclides (with <u>physical</u> half-lives longer than say one year) <u>in environmental media (soil, sediments)</u> should be taken into account.”</p>	<p>Clarification.</p>	Yes			
3	32	5.68	<p>“Different age groups should be considered when determining the representative person. It is generally sufficient to consider exposures to three age groups (1 and 10 year old children and adults) <u>while</u> with the embryo or fetus and breast fed infants also being considered in some limited circumstances [16].”</p>	<p>Wording.</p>	Yes			
3	33	5.75	<p>2nd sentence: “The period of validity for complex in-</p>	<p>Grammar.</p>	Yes			

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

			stallations like nuclear power plants, re-processing facilities and radioisotopes production facilities should be ...”				
2	34	5.80	“ For large, complex nuclear installations that may release a variety of aerosol, gaseous or liquid radioactive material to the environment . D discharge limits for groups of radionuclides rather than individual radionuclides may be appropriate when the radionuclides share relevant characteristics so that they can be measured with gross counting techniques. For example, airborne discharges from nuclear power plants are often grouped as follows: noble gases, halogens or iodine isotopes, and particulates. ...”	1 st sentence: Grouping of radionuclides may not be appropriate for simple (non-nuclear) facilities discharging only a few radionuclides, such as hospitals and small research laboratories. The proposed insertion makes this clear. 2 nd sentence: Wording.	Yes		
1	35	after 5.81	Please add a new paragraph with the following text: “ In addition to the discharge limits for certain groups of radionuclides, discharge limits may be imposed on specific radionuclides that are deemed to be of special significance (e.g. tritium and C-14 for nuclear power plants). In some cases, the regulatory body may also impose limits on specific radionuclides that provide early indications of changes in the operational status of the facility (e.g. uranium discharges for nuclear cycle facilities), or that may provide an exceptionally high contribution to the total off-site dose. ”	Essential amendment. In many States operating nuclear power plants, discharge limits are also imposed on specific radionuclides such as H-3 (tritium) and C-14. Corresponding techniques for sampling and measuring are applied by the operators. Examples from experiences in States are presented in the Annex of IAEA-TECDOC-1638 (Ref. [9]).	Yes		
3	36	Figure 4	Legend: “Figure 4: R Relation of source related dose constraints and authorized discharge limits.”	Editorial.	Yes		
3	37	5.91	“In order to demonstrate that discharges are in compliance with the limits and in	1 st sentence: Further recommendations	Yes		

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

			<p>order to check the assumptions used to evaluate representative person doses, source and environmental monitoring programmes should be established [8]. For <u>complex</u> installations like nuclear power plants <u>or reprocessing facilities</u>, environmental monitoring should also provide an additional means, besides effluent monitoring, of checking for unexpected releases.”</p>	<p>and guidance on source monitoring and environmental monitoring in the operational stage are provided in Paras 5.15–5.30 of the Safety Guide RS-G-1.8 (Ref. [8]). Please include a reference to this publication.</p> <p>2nd sentence: Means of checking for unexpected releases may not be necessary for simple facilities using limited amounts of short lived radionuclides, like hospitals and small research laboratories.</p>				
2	38	5.92	<p>“Simple installations, like hospitals or small research laboratories <u>using short lived radionuclides</u>, may not need a permanent environmental monitoring programme [8]. <u>However</u>, but a single monitoring campaign close to the installation <u>prior to and</u> at the beginning of operations should be considered by the regulator as a requisite to verify compliance.”</p>	<p>This paragraph provides a link to the Safety Guide RS-G-1.8 (Ref. [8]) which states in Para 2.9 “<i>Some practices and sources (e.g. hospitals or research institutes using short lived radionuclides) may not require a monitoring programme for the environment ...</i>” In the case that environmental monitoring is conducted to verify compliance with the discharge authorization, a monitoring campaign before the beginning of operations</p>	Yes			

				should also be considered, in order to establish a base-line.				
3	39	after 5.93	Headline of subsection: “Monitoring by <u>the</u> operator”	Editorial.	Yes			
3	40	5.95	2 nd sentence: “... the measurement of radionuclide concentrations in environmental media (including foodstuffs and drinking water) and doses <u>or</u> /dose rates due to sources in the environment.”	Editorial.	Yes			
3	41	5.96	“... and to provide a warning of unusual or unforeseen conditions and , where appropriate.”	Editorial.	Yes			
3	42	5.97	“Some subsidiary objectives, which should usually be fulfilled by a monitoring programme [8], are: <u>(a)</u> to provide information for the public; <u>(b)</u> to maintain a continuing record of the impacts of an installation or a practice on environmental radionuclide levels; and <u>(c)</u> to check the predictions of environmental models so as to modify them as appropriate in order to reduce uncertainties in the dose assessment.”	Include consecutive numbering in order to improve structuring of the factors that should be considered when setting the value for the dose constraint (compare, e.g., with Para 5.12).	Yes			
3	43	5.113	“... nuclear energy, scientific bodies and environmental groups (see Refs. [11] and [2]).”	Editorial (missing bracket).	Yes			
3	44	5.116	“As noted in paragraph 2.9 <u>2.20</u> , there is a requirement to exchange information with other States when a discharge could cause public exposure to these s <u>S</u> States; ...”	Wrong paragraph is cited.	Yes			
1	45	Section 6	Note: Compared to the other sections of the Safety Guide, this section is rather weak. For upgrading and further development of	Due to the economic importance of many NORM industries, Section 6 deserves more attention and	Yes	Upgrading will be considered		

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

			<p>the text, we recommend to use the following publications as a basis, together with a couple of other IAEA Safety Reports and TECDOCs related to NORM:</p> <ul style="list-style-type: none"> • IAEA: Monitoring and Surveillance of Residues from the Mining and Milling of Uranium and Thorium, Safety Report Series No. 27 (Vienna, 2002) • European Commission: Effluent and dose control from European Union NORM industries: Assessment of current situation and proposal for a harmonised Community approach (Luxembourg, 2003) 	<p>should be more elaborated in this Safety Guide.</p> <p>The discharges into air and water from NORM industries vary considerably with respect to the radionuclides discharged, the effective height of the stacks for aerial discharges, and the characteristics of the receiving aquatic environment for liquid 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. Consequently, no simple and general relationship exists between the discharge rate and the effective dose to members of the public. On the other hand, 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.</p>				
3	46	6.1	“Generators of naturally occurring radioactive material (NORM) discharges in-	Slight modification of text to address the whole zircon	Yes			

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

			clude onshore and offshore facilities for oil and gas extraction, surface and underground mineral mines, mills and processing facilities, and the production of rare earth metals, fertilizers, thorium, and titanium, <u>and the processing and use of ceramics using zircon sands.</u> ”	and zirconia industries (see IAEA Safety Report Series No. 46 “Radiation protection and NORM residue management in the zircon and zirconia industries”).				
2	47	6.2 (f)	“ While L iquid discharges from offshore oil and gas installations are unlikely to lead to significant human exposure, but there may be an impact on the environment. However, the cleaning on land of pipes containing radioactive residues with elevated levels of radium may result in liquid wastes which should be controlled;”	Clarification.	Yes			
2	48	7.1	2 nd sentence: “In general, two main options should be considered: (a) <u>Permanent S</u> hutdown followed by immediate dismantling of the facility; or (b) <u>Permanent S</u> hutdown of the facility with deferred dismantling to a later date.”	Clarification. The term ‘permanent shutdown’, as used in GSR Part 6 and DS452, means that the facility has ceased operation and operation will not be recommenced.	Yes			
2	49	7.3	1 st sentence: “The anticipated discharge levels following <u>permanent</u> shutdown of a facility are usually much lower than during the operational period since any short-lived radionuclides will have decayed.”	Clarification. The term ‘permanent shutdown’, as used in GSR Part 6 and DS452, means that the facility has ceased operation and operation will not be recommenced.	Yes			
2	50	7.5	“Dismantling of nuclear facilities usually takes place progressively over several years <u>and is usually divided into different phases. Effluent discharges typically vary through these phases.</u> Protection and safe-	Amendment for clarification. We assume ‘step’ means the individual decommissioning/dismantling actions, not the phases	Yes			

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

			ty should be optimized at each step, with account being taken of the experience gained in the previous steps. ...”	of a decommissioning project as such (compare with Paras 7.32 and 7.41 of the Draft Safety Guide DS452 “Decommissioning of Nuclear Installations”).				
2	51	8.3	Please add new sentence: “If authorization of the discharge is required, similarly to a new practice, discharges should be adequately characterized, exposure pathways identified and a radiological environmental impact assessment carried out. In such cases, the generic approach described in Ref. [6] should be applied to estimate the radiological effects on both the public and the environment. ”	For completeness, a reference to the Draft Safety Guide DS427 (Ref. [6]) on radiological environmental impact assessment should be included here.	Yes			
3	52	Ref. [5]	“INTERNATIONAL ATOMIC ENERGY AGENCY. Radiation Protection of the Public and Protection of the Environment , IAEA Safety Standards Series. IAEA, Vienna. [DS432]”	Citation of the correct title of DS432 (see current draft version dated 30 September 2014).	Yes			
3	53	Ref. [6]	“INTERNATIONAL ATOMIC ENERGY AGENCY. A General Framework for Prospective Radiological Environmental Impact Assessment and Protection of the Public , IAEA Safety Standards Series. IAEA, Vienna.[DS427]”	Citation of the correct title of DS427 (see current draft version 5 dated September 2014).	Yes			
3	54	Ref. [14]	“INTERNATIONAL ATOMIC ENERGY AGENCY. Governmental, Legal and Regulatory Framework for Safety, IAEA Safety Standards Series No. GSR Part 1 . IAEA, Vienna, 2010 (under revision, DS462).”	Add revision notice for the sake of completeness. GSR Part 1 (Rev. 1) will be finalized much earlier than DS442.	Yes			
3	55	Ref. [15]	“INTERNATIONAL ATOMIC ENERGY AGENCY. Safety Assessment for Facilities and Activities, IAEA Safety	Add revision notice for the sake of completeness. GSR Part 4 (Rev. 1) will be	Yes			

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

			Standards Series No. GSR Part 4. IAEA, Vienna, 2009 (under revision, DS462).”	finalized much earlier than DS442.				
3	56	Ref. [21]	“INTERNATIONAL ATOMIC ENERGY AGENCY. Application of the Concepts of Exclusion, Exemption and Clearance, IAEA Safety Standards Series No. RS-G-1.7 . IAEA, Vienna, 2004.”	For completion.	Yes			
2	57	Ref. [25]	Please split Ref. [25] (cited in Para 5.50) into two separate references: “ [25] OSPAR COMMISSION. 1992 OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, 22 September 1992. ” “ [27] EUROPEAN UNION. Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control (Codified version). ”	For completion. The OSPAR Convention is available on the following website: http://www.ospar.org/html_documents/ospar/html/ospar_convention_e_updated_text_2007.pdf Please note that Ref. [27] was originally adopted as Council Directive 96/61/EC and, after several amendments, codified as Directive 2008/1/EC. The document is available on the following website of the European Union: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:024:0008:0029:EN:PDF	Yes			

DS442 Regulatory Control of Radioactive Discharges to the Environment

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 1 of 7 Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date: 11 Nov. 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	Change “BSS” to “GSR Part3”	Editorial				
2	General	Make use of "facility" and "installation" clear.	Similar terms “facility” and “installations” are used together in this document. However the intent of usage of both terms is unclear.	Yes			
3	General	Format of citation of other Safety Standards should be consisted among Safety Guides (DS442, DS432, DS427).	Clarification. Examples would be found in other Safety Guides such as SSG-23 (Section3) and SSG-29 (Section 3 to 7.)	Yes			
4	General	Paragraph consisted of short statement should be consolidated with an appropriate paragraph. For example paras.1.3, 1.6 and 5.56.	To avoid unnecessary partitioning.	Yes			
5	1.6/2	Members of the public may be exposed to radiation as a result of such discharges to the environmental media.	Unification of wording. for example 1.10/L2	Yes			
6	2.1	Delete this paragraph.	The content of Section2 has been described in para.1.15. In addition, there is no additional information comparing with para.1.15. (In the case of para.3.1, more information is mentioned in the last text.)	Yes			
7	2.7/2	The establishment of discharge limits for facilities and activities, as described in this Safety Guide, is based on the optimization of the protection of members of the public only (e.g the endpoints of the assessment to define discharge limits is dose to the representative person).	This text is deemed to conflict with GSR Part3. GSR Part3 mentions “These operational limits and conditions: (e) Shall take into account the results of the prospective assessment for radiological environmental impacts that is undertaken in accordance with requirements of the regulatory body.” See para.2.18 of this document.	Yes No	Only will be deleted		A prospective assessment for radiological environmental impacts is that

							<p>described in DS427. To establish discharge limits the results of such an assessment must be considered (you can include in this assessment flora and fauna), but the optimization of the protection, as defined by ICRP and incorporated in the IAEA Safety Standards (optimization is the basis for the establishment of discharge limits) is only possible to apply to humans protection. This will be discussed in WASSC/RASSC meeting</p>
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DS442 Regulatory Control of Radioactive Discharges to the Environment

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 2 of 7 Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date: 11 Nov. 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
8	2.7/3	(e.g the endpoints of the assessment to define discharge limits is dose to the representative person ⁶) 6 GSR Part 3 define representative person as: An individual receiving a dose that is representative of the doses to the more highly exposed individuals in the population. The dose to the representative person is the equivalent of, and replaces, the mean dose in the 'critical group'. The concept of critical group remains valid.	Clarification This foot note is same as the no. 13 foot note of DS427.	Yes			
9	2.7/5	This approach assumes that the environment is protected by mean of the conditions resulting in the authorization for the practice ⁷⁶ . 76 Some States may consider more explicitly the protection of the environment, for instance including in the assessments the estimations of radiation exposures to flora and fauna. This may be considered necessary in some environmental circumstances needing special consideration (such as in protected areas or where there are endangered species). However, in general the protection of flora and fauna is not the <u>primary limiting</u> factor in setting discharge authorizations. Ref. [6] discusses protection of the environment, in the framework of radiological environmental impact assessment, with more detail.	Same as Comment No. 7.	Yes			Please, see Resolution to Comment No 7.

DS442 Regulatory Control of Radioactive Discharges to the Environment

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 3 of 7 Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date: 11 Nov. 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
10	2.9/1	Paragraphs 2.8 and 2.9 of the <u>GSR Part BSS3</u> [2] state...	Editorial However this comment is based on the current format of citation. See Comment No.3.	Yes			
11	2.13/5	(paragraphs 3.119 and 3.120 in the BSS [2])	Editorial The subject of this text is “the BSS”. Hence, this phrase is duplicated. However, Format of citation of paragraph number should be aligned among Safety Guides (DS442, DS432, DS427). See Comment No.3.	Yes			
12	2.16	Add paragraph number (para 3.126) to this paragraph.	Clarification	Yes			
13	2.17/(c)	(c) Shall assess doses to the representative person ⁷ due to the planned discharges; 7 In relation to the control of radioactive discharges the representative person can be considered to be the same as the previous concept of the critical group and similar methods can be used to assess doses to the representative person that were used previously for the critical group.	This foot note is moved to para 2.7. See comment No.8.	Yes			
14	2.18/(e)	(e) Shall take into account the results of the <u>prospective</u> assessment for of the potential radiological environmental impacts <u>that is</u> undertaken in accordance with <u>national</u> requirements <u>of the regulatory body</u> .	Correct citation of GSR Part3.	Yes	This was the text in the interring version of GSR Part 3. Now must be changed.		
15	2.22/2 nd from the bottom	...by the regulatory body {...} of authorized limits...	This part shows omission, hence the square bracket is not necessary.	Yes			

DS442 Regulatory Control of Radioactive Discharges to the Environment

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 4 of 7 Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date: 11 Nov. 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
16	3.1/3	...those of justification, optimization-dose limitation and dose limitation optimization	The order of 3 principles is justification, optimization and dose limitation.				
17	Dose limitation 3.4	Sub-section "Dose limitation" should be moved to after "Optimization".	See above comment.	Yes	Will be considered and revised. The order proposed in the comment is correct, but in the setting of discharge limits the logic is: You start from a dose limit, then a dose constraint, and then you optimize below the dose constraint.		
18	3.4(a) Footnote 10	(a) An effective dose of 1 mSv in a year ¹⁰ ; (b) <u>In special circumstances¹⁰, a higher value of effective dose in a single year could apply, provided that the average effective dose over five consecutive years does not exceed 1 mSv per year;</u> (cb) An equivalent dose to the lens of the eye of 15 mSv in a year; (de) An equivalent dose to the skin of 50 mSv in a year. 10 In special circumstances a higher value of effective dose in a single year could be permitted provided that the average effective dose over five consecutive years does not exceed 1 mSv per year. For example, in authorized, justified and planned operational conditions that lead to	Correct citation of GSR Part3.	Yes			

		<u>transitory increases in exposures.</u>					
19	3.5/2 (p.12)	.., economic and social factors being taken into account” [2+], should be applied ..	The definition of “optimization of protection and safety” is found not in SF-1 but in Glossary in GSR Part3.	Yes			

DS442 Regulatory Control of Radioactive Discharges to the Environment

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 5 of 7 Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date: 11 Nov. 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
20	5.5/4	Ref.[6] provides guidance for...	Editorial	Yes			
21	5.21/L2	The dose constraint should be expressed in terms of annual effective dose and therefore should be set at some fraction of the effective dose limit of 1 mSv in a year.	Clarification	Yes			
22	5.29	The range of dose constraint should be added to this paragraph.	Consistency DS432 (para.3.38) mentions “dose constraints are likely to fall within the range of 0.1 - 1 mSv.” DS427 (para.5.36) mentions “Dose constraints should fall within the range of 0.1 - 1 mSv.”	Yes			This will be discussed during next WASSC/RASSC/NUSSC meetings.
23	5.29/2 from the bottom	What is the evidence for the value of 800µSv?	Clarification and confirmation. This value emerges from this draft. Some evidence should be shown to clarify the fact.	Yes	This was a proposal during drafting by international experts. It will be explained during meeting.		This will be discussed during next WASSC/RASSC/NUSSC meetings.
24	5.73-5.74	Regarding authorized limit, it should be clarified whether this limit means statutory value or specified value of each operator.	Clarification	Yes			
25	5.73/3	These should take account of the radiological environmental impact assessment <u>in accordance with requirements of the regulatory body</u> and ...	This text is deemed to conflict with GSR Part3. GSR Part3 mentions “These operational limits and conditions: (e) Shall take into account the results of the prospective assessment for radiological environmental impacts that is undertaken <u>in accordance with requirements of the regulatory body.</u> ” See para.2.18 of this	Yes			This will be discussed during next WASSC/RASSC/NUSSC meetings.

			document.				
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DS442 Regulatory Control of Radioactive Discharges to the Environment

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 6 of 7 Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date: 11 Nov. 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
26	5.73/7	...for discharge for simple—less—complex facilities such as hospitals or small laboratories ...	Consistent with para.5.3 and 5.14.	Yes			
27	5.80/3	For example, airborne discharges from nuclear facilities plants are often grouped as follows	Clarification	Yes			
28	5.83	The operator should take provisions to report promptly to the regulatory body <u>any releases exceeding any reporting levels or authorized discharge limits in accordance with criteria specified in the discharge authorization issued by the regulatory body.</u>	This guidance is incomplete. See para.4.1 of WS-G-2.3.	Yes			
29	Figure4 (p.32)	The line of “Exemption Level” should be drawn not as a single line but as a band. <i>Exemption level (order of 10µSv/a)</i> <i>Margin to allow for doses due to regional and global sources and for the exempted sources</i> The text “the optimized discharge should give rise to doses with this range” should put beside the dotted line pointing to “dose constraint.”	Dose criteria “10µSv/a” for exemption is not a single value but it expresses “order of 10µSv/a.” Exemption should not be included in this area. Clarification	Yes			
30	5.95	Add Ref. [8] to this paragraph.	Two general types of monitoring are addressed in RS-G-1.8.	Yes			
31	5.113/2 (p.37)	...(see Refs. [11] and [2]).	Editorial	Yes			
32	5.116/1	As noted in paragraph 2.920...	Although para.2.9 mentions justification, para.2.20 mentions transboundary impacts.	Yes			

DS442 Regulatory Control of Radioactive Discharges to the Environment

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 7 of 7 Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date: 11 Nov. 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
33	5.117-5.119	Some heading for these three paragraphs should be added such as; Amendment, renewal, suspension or revocation of an authorization.	The contents of these paragraphs are not relevant to involvement of interested parties.	Yes			
34	6.1/6	...the activity concentration of ⁴⁰ K is greater than 10 Bq/g the <u>airborne and/or liquid</u> discharges from the facilities...	In para. 1.11 the scope is limited to airborne and liquid, but 1Bq/g or 10Bq/g is clearance level for solid materials.		To be considered		
35	6.2/1	Add some examples of NORM facilities to this paragraph or formulate a footnote of NORM facilities.	There is no definition of NORM facilities, hence some explanation including examples is useful to understand this term.	Yes			
36	7.1(a), (b)/1	<u>Permanent S</u> shutdown...	Wording	Yes			
37	7.2/2	<u>Deferred Postponement</u> of dismantling will allow time...	Wording See GSR Part6.	Yes			
38	7.3/1	The anticipated discharge levels following <u>permanent</u> shutdown of a facility	Wording	Yes			
39	7.5/2	Add following text to after the first text or elsewhere. “ <u>It is typical for effluent discharges to vary though the different phases of decommissioning. For example, as decommissioning leads to a progressive removal of radiological hazards, the radioactive discharges may be reduced.</u> ”	Proposed text is derived from para.8.19 of DS452. This description is also important. Consistency and coordination with DS452 would be required.	Yes	Also that at some points during decommissioning releases may increase during short time periods will be added.		

DS442

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: of...		NNR	Page....				
Country/Organization:		SOUTH AFRICA					
Date:							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	Various spelling mistakes and grammatical errors	Document is not technically edited	Yes			
2	General	Some quotations from the BSS [2] and SF-1 [1] are not verbatim. Where extracts from the references are provided in the document the text should be exactly the same as worded in the references. Some examples are: 2.10, 2.12, 2.13, 2.18(e), 5.12, etc.	Quotations from references should be verbatim.	Yes			
3	2.6	Change “generally aims to provides” to “generally aims to provide”	Improve readability	Yes			
4	2.9	Delete reference to paragraph 2.9 since only paragraph 2.8 is relevant to the text	Improve readability	Yes			
5	2.9	Incorrect reference given as BSS3,	Incorrect reference	Yes			

		should be BSS.					
6	2.16	Change text “the BSS [2] specifies” to “the BSS [2] requirement 30 specifies”.	Improve readability	Yes	‘GRS Part 3’ will be used instead of BSS.		
7	3.5 page 11	Change text “the number of individual (workers and members of the public)” to “the number of individuals (workers and members of the public)”	Clarification	Yes			
8	3.5 page 12	Change text “exposure and likelihood” to “exposure and the likelihood”	Improve text	Yes			
9	3.5 page 12	Incorrect reference [1] should be [2]	Incorrect reference	Yes			
10	5.1	Change text “or the development of an activity” to “to conduct specified activities”	Improve text	Yes			
11	5.6	Give specific paragraph reference [5.14] to [5.18] and not simply referring to the following Section	Improve cross referencing	Yes	Will be done at the end of the edition		
12	5.9	Change text “discharge limits previous to the start” to “discharge limits prior to the start”	Improve text	Yes			

13	5.12	Change text “Registration should be used” to “Authorization through registration should be used”	Improve text	Yes			
14	5.12	Add sentence before example: “Registration is best suited to those practices for which operations do not vary significantly”	Improve text	Yes			
15	5.46 (a)	Change text “if the decision were made” to “if the decision was made”	Improve text	Yes			
16	5.47 page 24	Change text “those responsible of nuclear safety” to “those responsible for nuclear safety”	Improve text	Yes			
17	5.68	Elaborate a bit more on “some limited circumstances”	Elaborate when the assessment should consider the embryo or fetus and breast fed infants.	Yes			
18	5.75	Change text “The period of validity for complex installation” to “The period of validity for complex installations”	Improve text	Yes			

19	5.87	Clarify text “This could also considering uncertainty”	The text is unclear. Does it mean “Dose constraints should also consider uncertainty in assumptions/models etc.”				
20	5.96	Change text “or unforeseen conditions and, where appropriate” to “or unforeseen conditions, where appropriate”	Improve text	Yes			
21	5.99	Change text “Monitoring programmes should be line” to “Monitoring programmes should be in line”	Improve text	Yes			
22	References page 45	Ref [6] Title is incorrect	Correct title should be given	Yes	Title has been changing		

**USA Comments on IAEA Draft Safety Guide DS442:
“Regulatory Control of Radioactive Discharges to the Environment”**

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	We recommend the current draft version be enhanced in format, structure, and content as well as additional improvement through edit.	See our comments below regarding our suggested quality enhancement of the document.	Yes			
2	General	The document should address the concept of integration of environmental data (e.g.; location of environmental monitoring samples or monitoring wells, quantity of sampling, variability of temporal sampling, and data quality) with record of discharges to assess potential doses to a receptor and potential impact on the environment. This information gap can be addressed by adding a few Paras in the sub-section on “Characterization of Discharges and Exposure Scenarios.”	Completeness: Characterization of discharges and subsequent impacts need to be linked environmental monitoring sampling and data, as well as assessment of quality and uncertainty of data used to assess dose or environmental risk. Such information could be crucial to establish adequate assessment of potential dose impact to a receptor, particularly after transport of radionuclides into environmental media.	Yes			
3	General	The document needs to provide more elaboration on establishing background data and associated uncertainties. Such	Completeness to discuss background uncertainties in order to evaluate effluent	Yes	The topic wil be discussed, However,		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		information is necessary especially for NORM facilities as background uncertainty could be relatively large corresponding to the discharge regulatory dose limits; this is particularly important for cases involving emanation of radon and thorn.	discharges particularly those containing "U" and "Th" series.		detailed discussion on background data seems more appropriate in guidance for site evaluation and early preoperational stages. Close to authorizing releases (discharges), this data should be already available. NORM is a particular case.		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
4	General	The document lacks discussions about the physical/chemical properties of radioactive materials that can be discharged into environmental media. For example, the document should address solubility characteristics of discharges in order to avoid sequestering and subsequent concentration of discharged radionuclides. In this context, the guidance may propose that all discharges of radioactive materials need to be readily soluble. We also note that physical and chemical properties of discharges could impact dose calculations to the receptor.	Completeness: Physical/chemical properties of discharges radioactive materials need to be addressed.	Yes	The topic will be included, yet at a general level		
5	General	The document is unclear regarding the compliance point for discharges. We assume the compliance point is at the point of effluent releases at the boundary of the facility or the site. However, it is unclear how to derive radionuclide concentrations corresponding to the proposed range of 10µSv -1mSv for the discharges into the sewerage particularly for R&D laboratories.	The document needs to clarify the compliance point for the authorized facility and for the specific activity.	Yes			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Boby Eid: Boby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
6	1.4	Define “discharge” and “release” The US NRC defines effluent “releases” and “discharges” differently than proposed in the IAEA DS 442 document. The reason for the precise definitions is due to the fact that NRC and USA licensees have had experiences with unplanned leaks and spills to ground water. In most cases, the unplanned leak or spill is classified as an “abnormal release” that is “released” from the plant to ground surfaces and ground water underneath the nuclear plants, but has not departed from the site boundary. Since some of the effluent may be contained onsite for a period of time, the length of time for a “discharge” from the site may take several months or years to leave the site boundary. In some cases, the leak or spill can be remediated by extraction from ground surfaces, and then properly monitored, processed, and discharged as a normal radioactive effluent. By regulation, licensees must report abnormal “releases” from the plant, and also report effluent “discharges” from the site	Harmony and Clarity in definition of “discharge” and “release.”	Yes			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
7	2.7	Insert footnote on representative person The concept of a “representative person” is introduced without clarification. A cross reference to reference [6] and [16] should be noted as delineated in Section 5.68. Note: Later in the document, on page 8, section 2.17(c) there is a footnote to explain the representative person. Also, the representative person is later described in Section 5.62. At this point, the reader wonders “what are the characteristics of a representative person?” Is this a maximally exposed representative person, an average representative person, what are the age and gender considerations, etc.	Clarity	Yes	More guidance will be considered. However, the definition of representative person could be different accordingly to the characteristics of the installation, the environmental situation and the national approaches.		
8	3.4(b)	ICRP statement on dose to lens of the eye should be reviewed and considered.	The ICRP has recently issued a statement on dose to the lens of the eye recommending a reduction for occupational exposure from 150 mSv to 20 mSv. Assuming the IAEA adopts the ICRP recommendations, the corresponding dose to the lens of the eye for public		To be considered		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			exposure may need to be reduced to 2 mSv (instead of 15 mSv).				
9	Figure 1 4.5	Figure 1	Notification process appears to fall between authorization and exemption, and is an unauthorized activity that relies on the discharging entity to notify the regulatory body. It is not clear how notification fits into Figure 1.		To be considered		
10	5.4 Figure 2	Delete “pre-decommissioning” and replace with “Decommissioning”.	These limits will apply during the decommissioning stage as well as pre-decommissioning stage.	Yes			
11	Para 5.7	We question the approach presented for reviewing the discharge authorization as only part of the periodic safety assessment (PSA). An alternative language should be used such that discharges exceeding regulatory limits should be reported to the regulatory authorities and should be noted during inspections and periodic safety review. We note that actions can be undertaken	Clarity	Yes	This will be mentioned here. Exceeding limits can be discussed in more details in the section on Compliance.		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		by the operator to address occasional exceedance over operating limits (e.g.; limits usually below allowed regulatory discharge limits).					
12	5.10, line 3	Remove the statement “e.g.; the releases to the environment after decommissioning are effectively zero.” It is well known that there will be certain releases to environmental media from residual radioactivity after decommissioning; however such releases should have been assessed to be lower than the decommissioning site release criteria.	Accuracy and correctness	Yes	We consider that residual releases after decommissioning could exist, but (controlled) discharges probably not. But there could be particular situations. This will be more discussed.		
13	5.6 Figure 3	Figure 3: add blocks or text in Figure 3 as described below: (a) “characterize background or current radiological status,” (b) assess potential transport of discharges to a receptor location,” (c) assess uncertainties, and (d) compare with existing regulatory discharge limits.	Completeness: The proposed steps to authorize discharges are crucial for regulatory decision-making.	No			We will add in the text what is the important background information but not giving a procedure.

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
							The procedure is to set discharge limits, not to perform the assessment.
14	5.22	Dose constraints should be on a shorter time frame to allow time for corrective actions without exceeding the constraint on annual basis.	A dose constraint should be established on a relatively short time frame (such as a month or a quarter time period) such that relatively excessive releases can be identified and corrected before annual constraints or limits are exceeded	No			Short term operational limits should be used and will be explained. But we will not call these 'constraint' to avoid confusion with 'dose constraint'.
15	Para 5.49	Might it be useful to make reference in this Para to stakeholder viewpoints as part of multi-criteria methods?	Consideration of stakeholders' inputs.		To be considered		
16	Para 5.29	The para states "Based on the experience in States this range for the dose constraint for nuclear fuel cycle facilities	Please provide clarification and verification of the dose limits range.	Yes	This range will be discussed at next		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		(including reactors) could be of annual doses of between 100 and 800 μ Sv. “Such range of dose limits needs to be clarified and verified.			WASSC/RASS C meetings.		
17	Para 5.53	Consistent with ICRP 103, the paragraph should contain a statement that collective dose is not to be used to attribute specific collective risk or detriment to a population. Its use is only for purposes of comparing options in the optimization process.	Clarity and completeness	Yes			
18	Para 5.75 & 5.92	The fifth sentence says that simple installations like hospitals... Not all hospitals may be simple, particularly if they are broad scope in nature and have R& D facilities. Suggest adding “some” in front of hospitals to avoid perception that all hospitals fall in this category.	Accuracy	Yes			
19	Para 5.71c	Replace “plant” with “facility”	Broaden application of guide to multiple and diversified users.	Yes			
20	5.22	Dose constraints should be on a shorter time frame to allow time for corrective	A dose constraint should be established on a relatively	No			See Resolution to

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		actions without exceeding the constraint on annual basis.	short time frame (such as a month or a quarter time period) such that relatively excessive releases can be identified and corrected before annual constraints or limits are exceeded				Comment No 14.
21	5.37	“Pre-operational studies should also be carried out to determine the existing levels of radiation ...”	Editorial – added “of” between “existing levels” and “radiation”	Yes			
22	5.48	“...(for instance, for nuclear power plants or similar installations).”	Editorial – replaced “NPPs” with “nuclear power plants” for consistency with rest of document	Yes			
23	5.52	Truncate the collective dose at small doses in accordance with ICRP recommendations.	The concept of collective dose should include calculational methods that make use of truncation of very small doses.	Yes			
24	5.77	Establish design criteria and numerical guides.	Section 5.77 may be improved by establishing design criteria and numerical guides. During the initial licensing phase/period, the licensee should provide a	Yes	Clarification will be added. It is mentioned that during the initial licensing phases there are		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			safety analysis of its planned operations, maintenance activities, and abnormal operations. The regulatory authority should establish design criteria that include numerical guides on effluent discharges for use in the licensee's design and construction period. The regulatory authority should review the safety analysis and approve discharge limits that are reasonable under the circumstances, allowing the licensee to operate within the established ALARA design criteria. The regulatory authority should begin to take regulatory action when the licensee exceeds the discharge limits.		discussions on effluent releases (and the associated radiological impact) but we want to make a clear distinction between this desing/construct ion phases discussions and the regulatory act to establish a discharge limit. Of course there is a relation, but it's not the same thing and even the numbers can be different.		
25	5.77(g)	Delete the "period of validity" concept.	Section 5.77(g) Period of validity should be eliminated and replaced with the period	Yes			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Boby Eid: Boby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			of the operating license for the facility.				
26	5.78 5.78	<p>Consider both normal operating events and abnormal operating events.</p> <p>Nuclear power plants normally have decreased effluents during maintenance activities.</p>	<p>Section 5.78 states that the “discharge limits should include a margin for flexibility anticipated under normal operating events.” Suggest that the sentence state that the margin of flexibility should include both anticipated normal and “abnormal” operating events.</p> <p>Section 5.78 Note: In most cases, nuclear power plants effluent discharges “decrease” during maintenance, and therefore, the example given should be changed to “for example, an increase in the throughput of patients in a nuclear medicine department or an increase in atmospheric discharges from a nuclear power plant during</p>	Yes	<p>The IAEA terminology will be used (e.g. ,anticipated operational occurrences)</p> <p>Text will be expanded. It could be the case that during maintenance or refueling the rate of releases increases temporarily in a NPP.</p>		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov)							
Page 1 of 11							
Country/Organization: USA/US NRC							
Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			maintenance (delete the word “maintenance” and insert “abnormal operations such as fuel failure.””				
27	5.80	Include C-14	Section 5.80 should include reporting and dose assessment for carbon-14. The use of scaling factors should be recommended for radionuclides that cannot be promptly analyzed at nuclear facilities (e.g., difficult-to-detect radionuclides such as Ni-63, Fe-55, Sr-90) and transuranic radionuclides. The licensee should be required to perform and periodically update scaling factors.	Yes	Will be expanded, but still keeping general.		
28	5.81	Use of “effective” measurement values instead of most limiting radionuclide	Section 5.81 should provide for licensees to use an effective gross measurement value (instead of the most	Yes	Will be clarified		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			limiting) if the licensee has determined the relative mix of the alpha and / or beta radionuclides and established an effective gross value.				
29	5.93	Clarify intent as to “effluent” monitoring or “environmental” monitoring	Section 5.93 – “The requirements for monitoring should be specified in the discharge authorization by the regulatory body.” The sentence should specify the type of monitoring required; i.e., effluent discharge monitoring or environmental monitoring.	Yes	Source (e.g effluent) and environmental monitoring will be added.		
30	5.98	Include meteorological monitoring.	Section 5.98 should include meteorological monitoring for licensees that discharge significant quantities of radioactive effluents. The use of average meteorological conditions (rather than real-time	Yes	Will be considered		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			measurements) should be authorized whenever the effluent discharges are within permitted effluent discharge limits.				
31	5.99	Provide a cross reference to IAEA standard for environmental monitoring.	Section 5.99 should refer to the IAEA safety standard for environmental monitoring.	Yes			
32	5.101	Require additional monitoring only when abnormal discharges exceeding effluent discharge limits	Section 5.101 should only require independent monitoring when licensees have abnormal discharges that routinely exceed effluent discharge limits. Operational experience in the USA has shown that independent monitoring is not a beneficial or cost effective practice unless licensees are routinely exceeding effluent discharge limits.	No			Despite graded approach should be applied (and some practices would not need periodic independent monitoring), independent monitoring should be done always for certain

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
							types of installations. An independent monitoring can be much more limited than the monitoring program by the operator and is only for verification of the operators program (ej. A few radionuclides , a few/one location, a few times/once per year).
33	5.87	“This could also considering uncertainty.”	Editorial – sentence fragment				

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
34	5.95	“Firstly monitoring of the source, which implies measuring activity concentration or dose rates at the discharge point or within the activity and facility and, secondly, monitoring of the environment, which involves the measurement of radionuclide concentrations in environmental media (including foodstuffs and drinking water) and dose/dose rates due to sources in the environment.”	Editorial – sentence fragment	Yes			
35	6.1	There is a missing word “be.”	Section 6.1 The word “be” is missing. The sentence should read “...the discharges should “be” controlled”	Yes			
36	6.2	Incomplete first sentence	Section 6.2 The first sentence is incomplete. “In principle, the procedures for the control of discharges from NORM facilities are the same as those for practices ????”	Yes			
37	7.1	Effluent monitoring during	Section 7.1 The conduct of a	No			Decommissi

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		decommissioning should not be a different process than during operations.	decommissioning “project” is a post-operational situation that should not be considered a different practice subject to authorization requiring specific regulatory provisions.				decommissioning activities can overlap operation. But at some point it could be a totally different practice (with new operator, new operational conditions, new license, new discharge limits)
38	7.4	Clarify the two main options.	Section 7.4 “Whichever of the two main options is chosen.” What are the two options (prompt dismantling or delayed dismantling?)	Yes			
	7.4(f)	Reduce the frequency of inspections during decommissioning.	Section 7.4(f) The need for regulatory inspections of	No			Decommissioning

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			effluent discharges during decommissioning is normally a reduced frequency instead of an increased frequency.				activities could lead to higher releases in short periods.
39	Section 7.5	Increased regulatory control of effluent monitoring is not necessary during decommissioning	Section 7.5 states that “Because unexpected difficulty may arise during each step (of decommissioning), regulatory control of the discharges should follow each step. This is an unnecessary increased regulatory control, since normally effluent discharges during decommissioning are lower than during operational periods.	No			See previous Resolution
40	Section 8.5	This is too broad a recommendation, delete the “in all cases”	Section 8.5 states that “In all cases, the operator should be required to demonstrate that the dose to the representative person is below the effective dose limit of 1 mSv in a year.” While all effluent	Yes			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Multiple (Coordinated by Bobby Eid: Bobby.abu-Eid@nrc.gov) Page 1 of 11 Country/Organization: USA/US NRC Date:11/12/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			discharges should be strictly limited to less than 1 mSv in a year, this statement is too broad, and would require “all” facilities to demonstrate compliance, even for those licensed facilities with extremely low or no effluent discharges.				
41	A-16	Make an explicit statement that limits should be in terms of “dose” and not of “risk”.	A-16 A statement should be added that effluent discharge limits should be expressed in terms of a quantity that can be readily measured, such as activity or dose, and should not be expressed in terms of cancer morbidity or cancer mortality.	Yes	Despite dose (to public) is not measured. In the case of using dose (a practice in some countries) this dose is estimated with models.		
42	A-18	Include C-14	A-18 The recommendation should include carbon-14.	Yes			
43	A-23	Establish a one year limit for effluent discharges with a requirement for	Section A-23 should include a recommendation that	Yes	Will be expanded		

COMMENTS BY REVIEWER				RESOLUTION			
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		licensees to cumulate dose on a monthly or quarterly basis and project annual doses such as to meet the annual discharge limit.	licensees perform “cumulative” dose assessments on a time period shorter than an annual period; e.g., on a monthly or quarterly basis.				
44	A-24	Only require the use of real-time meteorology when effluent discharges exceed normal operational levels.	A-24 The use of real-time meteorology should only be required for effluent discharges that exceed normal operational levels and exceed acceptable levels established by the regulatory authority.	Yes	Something on meteorological measurements will be added.		
45	A-25	Require increased licensee action (instead of increased regulatory action) when limits are temporarily exceeded.	A-25 states that “Based on the optimized discharge levels or operational experience the regulatory body will set authorized discharge limits. Exceeding limits will normally initiate regulatory action.” This second sentence should be	Yes	It will be clarified. However a regulatory action means, for example: to require an investigation and corrective		

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			revised as follows: “Exceeding limits will normally initiate a required licensee action to take corrective actions and possibly include regulatory action based on a review of the licensee’s Special Report to the regulatory agency.”		actions if necessary, to impose sanctions if appropriate, etc. It is related to enforcement.		
46	A-26	Delete the term “head-room”.	A-26 The use of the term “head room” should be discontinued, since the term is not an internationally common terminology.	Yes			
47	A-28	The time period for the authorization of effluent discharges should be the same as the time period of the license.	A-28 The “period of validity” of the discharge limits should be the same as the license duration, and should not be a short term period that requires review and renewal when the licensees are routinely meeting authorized effluent discharge limits.	Yes	But subject to periodical review and, if justified, the discharge limits may be changed.		

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48	A-30	Change in “most” cases to in “some” cases.	A-30. The sentence should say “In most cases...” instead of “In some cases...” Also, the period of the effluent discharge limits should coincide with the period of the “facility license” so that the discharge limits are also applicable during decommissioning.	No			See previous comments on time validity of discharge limits and discharge limits during decommissioning.