

TITLE; Argentinean NUSSC comments DS452

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Ricardo Waldman		Page.1.. of.8..					
Country/Organization: Argentina, Nuclear Regulatory Authority		Date: 14-11-17					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	At this Step the draft shows the advancement of the revision process and NUSSC should encourage its continuation. Some topics merit analysis and discussion, such as:		X			
2	General Terminology	In paragraph 1.17 the term ‘abnormal events’ is used ‘and incidents’ in paragraph 2.4, have they different meanings in the context of this draft? On the other hand, ‘accident’ in paragraphs 2.6 and 7.54 is clear.		X			
3	Par. 1.23	States that ‘security aspects’ are outside the scope of the draft and they are referred to the IAEA Nuclear Security Series. However safeguards aspects are missing, they also should be mentioned as outside the scope; a reference to paragraph 4.29 is advisable.	Completeness	X			
4	General Paragraph 2.4, first line	Why such “proper consideration” is limited to workers?	Completeness	X			

5	General Par. 2.9	The draft is addressed to diverse nuclear installations, so the application of the graded approach should be mentioned or a reference to Requirement 2 should be added.	Completeness			X	Graded approach is addressed in 2.10-2.15, so it is not clear why it should also be addressed in 2.9.
6	Par. 2.11, second line	The application of a graded approach helps to optimize efforts invested in planning, development of decommissioning documentation, conduct of supporting analyses and assessments, effective use of resources , and conduct of decommissioning actions ...	Completeness		X		Modified, as “application of a graded approach helps to optimize efforts invested in effective use of resources” does not sound well.
7	General Par. 2.13	In some Member States it is conceivable to continue the regulatory oversight after decommissioning finalization (enclosure / entombment is one example). Note that once decommissioning is completed and so accepted by the regulatory body, the operating organization ends its responsibility.		X			First part accepted, second part is addressed in the new para 3.24.
8	General Par. 2.15	The internal management system should cover the whole decommissioning process and not only such minor modifications. Besides the term “may” (first line) should read ‘should’ in the context	Completeness		X		Please see the revised text which accommodates similar comment from Germany.

9	General Par. 2.16, fourth line	of a Safety Guide. What means “secondary waste”? Clarification (for example in a footnote) seems advisable.	Completeness	X			
10	Par. 2.20, second line	The results of the safety assessment or part of the safety assessment, under the umbrella of the management system , which may be developed by subcontractors, ...	Completeness		X		The review, approval and implementation should be done in accordance with the IMS.
11	Par. 3.4, second line	Although it is preferable to have regulatory responsibilities for decommissioning within a single regulatory body, such responsibilities are often in some Member States divided among several bodies already having responsibilities for protection and safety.	The term “often” is not applicable for most Member States	X			
12	General Par. 3.6, lines 1 and 2	This scenario should not be accepted by the IAEA, it isn’t covered by the Fundamental Safety Principles.	Clarification is advisable.	X			Clarification provided, please see the revised text
13	General Par. 3.14, lines 2 and 3	The phrase “to ensure that appropriate funds will be available when needed” is correct but when the nuclear facility is owned by the State, how can the regulatory body ensure that?	Clarification is advisable.			X	The RB does not ensure, it identifies (or contribute to the identification of) funding mechanisms, which ensure...

14	General Par. 3.15, last sentence	The situation is clear but its implementation depends of the legal competence of the regulatory body. Here there is a grey zone and it should be undertaken on a case-by-case basis (for instance, contracting specialists, etc.).	Clarification is advisable.			X	We do not provide detailed guidance on industrial safety aspects, but it is appropriate to emphasize its importance during decommissioning.
15	General Par. 3.19, second line	It should be clarified by whom such records are collected and retained, and when. Note that during the decommissioning process the licensee has, among its responsibilities, the requirement for such collection and retention, but once the process is completed and so accepted by the regulatory body is this body that must take care of those documents.	Clarification is advisable for regulatory bodies possessing a limited experience in this field.	X			
16	Par. 4.5, second line	General Concerning “Safety management”, INSAG-13 Report should be added as a reference; with due adaptation their concepts are also applicable to decommissioning.	Completeness			X	INSAG-13 is not a Safety Standard and can’t be referenced.
17	Par. 4.19	General Does “inactive trials” mean the use of, for instance, mockups?	Clarification is advisable.	X			Inactive trials means testing a technique or tool in an inactive environment - cutting a clean pipe, drilling non-activated concrete

18	Par. 4.20, last line	General “quality management” should read ‘quality in the framework of the management system’.	Clarification is advisable.			X	block before applying a technique/tool on a contaminated/activa ted structure or component. In tis context we prefer using “quality management” instead “quality”.
19	Par. 4.22, second line	General It isn’t clear if the phrase “to the safety risks” is addressed to radiological and nuclear safety in the context of IAEA Safety Standards or if it is wider (for instance, also including industrial safety) and in the context of the regulatory body’s legal competence.	Clarification is advisable.			X	The phrase refers to the safety risks associated with a specific work/procedure. Sometimes it will predominantly be radiological risk, sometimes industrial, very often combination of both.
20	General Paragraph 5.9, fourth and seventh bullets	The term “physical” is not clear, “socioeconomic impact” is clear but do the latter pertain to the competence and responsibilities of a regulatory body or to the Government? See 5.39 and 5.40.	Clarification is advisable.		X		Example provided to clarify “physical). Second part of the comment not clear, we do not discuss here competencies and responsibilities, but impact of

21	General Paragraph 5.12	It seems addressed to the simultaneous decommissioning of all the nuclear facilities located on a multi-facility site, is it the objective? Paragraph 5.13, sixth bullet: The phrase “Optimization of discharges of gaseous and liquid effluents” seems more connected to operation than to decommissioning.	If it isn’t, clarification is advisable because in normal situation only one facility can be decommissioned and the rest of them stay operational, see 5.27.			X	decommissioning to the society and economy. There are cases of multi-facility sites where several facilities are decommissioned in parallel. Sometimes the overall site strategy is to put the first shutdown facility in safe enclosure until other facilities cease operation, so then all are decommissioned in parallel.
22	General Par. 5.16, last sentence	The terms “their consequences” are not clear; consequences of the recovery actions or of the decommissioning actions or both?	Clarification is advisable.	X			
23	General Paragraph 5.29, second and third lines	Regarding entombment, even if Chernobyl is a single case its experience should be taken into account in spite of concerns and the lack of regulations, and IAEA should consider elaborating technical guidance with their learned <i>pros</i> and <i>cons</i> . Last sentence of this paragraph seems more good	Completeness			X	We understand this comment is related to 5.19. Chernobyl case is not an entombment. It is a special case of safe enclosure for more than 100 years. But there is an intention

		intentions than specific realistic guidance.					to come back one day, to retrieve the material and dispose it of. There are other examples of entombment, especially in the US.
24	General Par. 5.28, second line	Why “for different purposes”? A similar purpose should also be considered.	Completeness	X			
25	General Paragraph 5.42, bullets (c), (e) and (f)	Excepting disruptive accidental situations these facilities should be planned and implemented since the design of the first nuclear facility in the State because, simply, they are needed for its operation.	Completeness			X	Not clear what is expected, no revision is proposed
26	General Par. 7.10	The plan should also consider design provisions and operational experience for facilitating decommissioning.	Completeness	X			
27	General Par. 7.14, first sentence	For learning from experience, IAEA should add references to such experiences in the extent of possible. Ditto, the experience of Member States heading paragraph 7.31 as well as the techniques and methods mentioned in 8.9.	Completeness			X	Comment rejected as it is not allowed to reference publications other than Safety Standards.
28	Page 39, second	“Criticality safety records”: Its meaning isn’t clear in the	Clarification is advisable.	X			Reference added. It is stated in the

	bullet	decommissioning context.					introductory sentence of this paragraph that these are records from the history of the nuclear installation, including records from operational phase.
29	General Par. 7.24	The use of the graded approach should be mentioned again.	Completeness	X			
30	Par. 7.50 at its end	... during the licensing process for decommissioning if and when applicable .	Clarification is advisable.	X			
31	Par. 8.2, last bullet	Establishment of an interim waste storage area within the installation. on-site .	It is more flexible	X			
32	General Par. 8.3	The examples of “criticality” and “criticality monitoring” are not clear in this context.	Clarification is advisable.	X			
33	General Par. 8.4, second and third lines	The phrase “reduces the challenge posed to the ventilation system” is not clear, what challenge and based on what?	Clarification is advisable.	X			
34	General Par. 8.7, second line	For preventing confusion it should be clarified who ensure the safety of the nuclear installation when such activities are deferred in part or in whole. In practice is the licensee	Clarification is advisable.	X			

35	Par. 8.12, third bullet	<p>because the decommissioning process is not completed nor accepted as such by the regulatory body, but for newcomers the explanation would be useful.</p> <p>It isn't a part of the legal competence of a regulatory body; possibly it is a matter of interest of the licensee or of another organization.</p>	Clarification is advisable.			X	In 8.12 we do not discuss legal competence of a regulatory body, we just list the reasons why decontamination is usually performed.
36	Paragraph 8.33, third line	The phrase "use of properly derived radionuclide vectors (scaling factors)" is not clear.		X			
37	General Par. 9.21, last two lines	Is it realistic? Are there greenfield scenarios after decommissioning in real life? If yes, references should be welcome as examples of good practices.	Clarification is advisable.			X	Yes, there are many examples or RRs and even NPPs. We can't reference publications which are not Standards.
38	Ref. 3 on	It seems not applicable to this draft.	Clarification is advisable.			X	Ref. 3 is currently a

	page 61						valid Safety Standard (under revision) and is mentioned in the context of the scope of DS452.
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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: C. Mommaert		Page 1 of 2					
Country/Organization: Belgium/Bel V		Date:17/10/2014					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	4.29	Actual text states: “Security and safeguard concerns will be reduced as decommissioning occurs since radioactive material is being removed from the installation.” Proposed text for addition : “Since non-nuclear contractors might be assigned major dismantling tasks, site access and security may still remain an important issue.”	For classical demolition of buildings after free release, contractors still need to comply with nuclear security regulations to access the (still) nuclear site, before license termination.	X			
2	8.10	“... Benefits can be taken from computer-based simulations given the necessary bench-marking being performed, ..;”	Computer-based simulations are time consuming and might lead to wrong predictions (causing more time loss) if no suitable bench-marking is performed.	X			
3	9.6	“Any changes to the design and implementation of the final survey plan...” should be preceded by : “The final survey plan is part of the final decommissioning plan and has been –as such- approved by the regulatory body.”	The final survey plan is not defined in the document.	X			

4	9.7	<p>To be added after : “The criteria for release of the nuclear installation from regulatory control, ..., should be convertible into terms of measurable quantities that can readily be compared with the results of the field measurements.”</p> <p>“Sampling methods should be defined and justified in the final survey plan”.</p>	<p>Sampling methods can strongly influence the results and conclusions. Some guidance and justification is therefore recommended.</p>		X		<p>We agree with the comment, but it is formulated in a way which is more related to planning (Section 7). Thus, we propose slightly different formulation, to put the comment in context of Section 9.</p>
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Canada's Comments on DS452 – Decommissioning of Nuclear Installations

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: WASSC, NUSSC, NSGC		Page 1 of 3					
Country/Organization: Canada/CNSC							
Date: October 16, 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	2.12, 3.23	<p>Include</p> <ul style="list-style-type: none"> Public consultation 	Public consultation (stakeholders including Aboriginal groups) is important to the planning and eventual success of a decommissioning project.		X		“Involvement of interested parties” used instead of “public consultation”. Para 3.18 explains responsibilities of the regulatory body for informing and involving interested parties.
2.	5.10, 5.30	Suggest consistent terminology throughout section 5, for example: decommissioning strategy and dismantling strategy are equally used	A decommissioning strategy takes into account all factors that need to be considered when planning for and applying to national authorities for a licence to decommission. The options for dismantling provide the basis for developing a decommissioning strategy.			X	In the text we use “immediate dismantling strategy” and “deferred dismantling strategy”, as these are the names of the two basic decommissioning strategies defined in the GSR Part 6. We never use “dismantling strategy” in any other way.
3.	6.9	While the financial guarantee can be a combination of mechanisms, a low-risk method should be used to secure the funds required to put the nuclear installation in a safe state of	Risk management			X	Comment not clear. What is the proposal? We do not discuss safe storage (safe

		storage.					enclosure, deferred dismantling strategy) in this paragraph. Why only to put the facility in safe state of storage.
4.	7.2 7.31	Introduction of an overarching document for multi-unit or complex nuclear installations that covers the timeline from pre-shutdown to site restoration. This document or “decommissioning strategy” will provide milestones including submission of a stabilization activity and storage with surveillance plans, surveillance phase, environmental impact assessment, submission of a final decommissioning plan, dismantling and demolition phase, site restoration phase and application for the site to be released from licensing from the regulatory body				X	Session 5 deals with a site strategy for a multi-facility site (paragraphs 5.11-5.13).
5.	7.32	Where decommissioning of the facility is to take place in discrete phases, an interim end-state report should be prepared when each planned interim end state is achieved. The report should describe the physical condition of the facility as well as the remaining hazards.	To demonstrate that the interim end-state has been achieved in accordance with the Final Decommissioning Plan	X			New para 7.33 added.
6.	Following 7.46	Recommend adding: Description of Project Management	Completeness of Final Decommissioning Plan			X	The content of the Final

		Structure; Description of Content of the Final Report (TOC); Listing of Records required for long-term retention and the method of retention; List of other regulatory agencies involved in the decommissioning project.					Decommissioning Plan is discussed in the Annex I. The content of the Final Decommissioning Report is discussed in the Annex II. There are many Member States which object addition of more detailed information in the main body of the Guide, as these details are different and country specific.
7.	8.32	Waste generated during decommissioning should be segregated into different categories (radiological, non-radiological, hazardous and non-hazardous) based on accepted procedures and criteria. Specific plans for the re-use, recycling, storage, or disposal of that waste should be required.	Clarity of Waste Management Plan	X			
8.	Figure 1	Include: Licence for Site Preparation	Completeness of all phases of licensing.			X	Country specific license, not common for many Member States to be included in the Standards.

DS452 - Draft Safety Guide: Decommissioning of Nuclear Installations

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer:				Page 1 of 3			
Country/Organization: EC				Date: 9 Nov 2014			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1. General		The document is an improvement of the existing Safety Guides. At the same time it will benefit from elaborating and giving an example on the content of an initial decommissioning plan	Suggested to add an annex			X	The content of the IDP is suggested in para 7.10. During drafting of the Guide, it was not possible to achieve consensus on more detailed description of the IDP content.
2. General	1.14	As the scope of the document does not cover uranium milling and milling facilities, which other IAEA Safety standard will apply	Suggested to include in the scope	X			Already included in 1.21: "Management of Radioactive Waste from the Mining and Milling of Ores", IAEA Safety Series No. WS-G-1.2, IAEA, Vienna, (2002), now under revision as DS459.
3. General	5.2, 5.20	Entombment is not addressed in detail, although several research reactors have applied this strategy. Is the IAEA planning to address this aspect in a separate document?		X			Yes, the IAEA is working on a "position paper" on entombment.

4. General	1.2, 1.10, 5.1, Annex I	The use of the terms “waste” and radioactive waste” will need to be checked in the text for consistency	Decommissioning generated radioactive but also waste that can be cleared from regulatory control.	X			In the Annex I we intentionally use the word “waste” without the attribute “radioactive” to emphasize that the FDP should cover management of all types of waste (most of the waste would be non-radioactive).
5. General		Safeguards, physical protection and emergency planning are not detailed in the main text, although they appear in the Annex I, page 68	Suggested to elaborate in the main text			X	Security (physical protection) and safeguards aspects are important during decommissioning, so have to be addressed as part of the final decommissioning plan or as separate supporting documents. But it was agreed not to provide guidance on these aspects in this Guide, as stated in paragraph 1.23. Emergency planning and is covered in Section 8 (8.26-8.29).
Specific							

6.	1.1.	Permanent shutdown in the near future	Broader scope of this Guide			X	The word “near” is needed because of “many of them”. Otherwise, all the facilities will stop operation sometime in the future.
7.	1.3.	(1 st sentence) suggested to replace “radiation protection” with “clearance of sites”	Radiation protection is a cross cutting issue and not specific activity of decommissioning		X		Here we discuss decommissioning actions (physical works, formerly called “activities”). Release of sites is more an administrative activity which is based on the results of the final survey. To accommodate your comment, we added radiological surveys.

8.	1.6	(last sentence) is a bit misleading so it is suggested to delete the phrase “in some cases, when decommissioning license is granted”	The organization for decommissioning needs to be established and known when applying for a licence not after the licence is granted			X	We agree with the “reason” for the comment provided, but our point was that planning is sometimes included as part of the overall decommissioning project, and sometimes is performed as a separate project, even by a separate entity.
9.	1.7	Add “, siting, design, construction and operation ”	Detailed decommissioning plan is also elaborated during operation phase			X	This part of the text is related to the need for early decommissioning planning for new facilities, and not for the existing ones. That is why operation is not mentioned. If the facility is already in operation, then it is an existing facility.

10.	1.10-1.12	For completeness, it is worth mentioning that other IAEA safety standards also apply, e.g. Basic Safety Standards, requirements on emergency, and management system	Completeness of the text			X	Generally, all the General Safety Requirements are applicable. As the requirements listed in your comment are already mentioned in the relevant Sections of the Guide (2, 4, 8), we wanted to avoid duplications.
11.	1.15	Suggested to replace “decommissioning management principles” with “ decommissioning plans ”	Clarity of the text		X		The final decommissioning plan is the one that is implemented.
12.	1.23.	Add “they”, so the first sentence reads but they are outside...”	Clarity of the texts	X			
13.	2.2., 2.19	Replace “radiological protection” with “radiation protection”	Accuracy of terminology	X			
14.	2.12	Additional examples of grading could be added, e.g. in scope/extent of characterisation, monitoring programme, and safety assessment	Completeness of the text	X			Safety assessment already mentioned under Documentation
15.	2.15	During conduct of decommissioning the licensee shall apply an integrated management system. The licensee may also apply internal authorization system....	The current text can be misinterpreted as management system is a requirement. An option (depending on the country’s legislation) is the use of internal authorization		X		Paragraph 2.15 already revised based on the other comments. Please see the revised text.

16.	3.14	The “regulatory body” needs to be replaced by “licensee” or “government”	Accuracy of the text Defining the funding mechanisms for decommissioning is not the role of the regulator, but the operator/licensee		X		Please see the revised text, which accommodates a similar comment from ENISS.
17.	3.20	Additional emphasis on management system and sufficient and trained staff of the regulator is suggested	In line with Safety fundamentals and requirements for decommissioning and management system	X			
18.	4.2	Suggested to add the following to the bullets: radiation protection, safety assessment, cost estimation, regulatory/licensing expertise	These are important skills that the licensee should have at its disposal in order to develop and implement decommissioning plans	X			We understand this comment is related to para 4.12 and not 4.2.
19.	5.3	Suggested to delete “intermediate strategy”	The text could be misinterpreted and also this term is not used later in the text	X			
20.	5.8	Suggested to add “funding and availability of financial resources” to the factors influencing the selection of a decommissioning strategy”	It is an important aspect in practice	X			
21.	Page 35	Fig 1 replace “Licensee” with “License”	Accuracy of the text	X			

22.	7.41.	Suggest to add 'characterisation' as a specific step in Phase 1 or Phase 2	Characterization is not very much detailed in the whole Guide			X	Characterization is usually done under the operational license during transition, and is not part of the decommissioning project.
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Draft Safety Requirements
DS452 Decommissioning of Nuclear Installations (1 September 2014)

ENISS Comments

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: ENISS		Pages 1 of 21					
Country/Organization: ENISS		Date:16.10.2014					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	<p>DS 452 is a mature document with only limited number of needs for change. It follows consequently the structure of DS 450, so that the content is following the same logic as the requirements document. Most of the advice is comprehensible and reflects the experience gained so far in many countries.</p> <p>As decommissioning projects are more unique than standardised the question of experience gained and activities to be reported and documented is somewhat overdone.</p> <p>Sometimes in the document the conditions for repository are noted. Actually there are only few countries which can answer this. For a very long time intermediate storage is the only option for waste coming from decommissioning activities. This fact could have deserved more room.</p> <p>Many paragraphs are repeated in one or other way. For instance several paragraphs of Chapter 7 could be arranged under the Chapter 8 in conducting the decommissioning.</p> <p>Regarding the quotations of the requirements, we recommend to have the same format in all IAEA safety standards (e.g. as in DS448).</p> <p>There are some points where a clarification may be helpful. Our proposed changes are the following (marked in red).</p>		X			Excellent and very useful comments have been provided by the ENISS. We carefully considered all of them and tried to resolve them in a way consistent with the decommissioning approach recommended by the IAEA. Some comments are not in line with the IAEA approach, but all are well justified and we understand the reasoning behind. We accepted most of the comments (please consider “accepted with modification” as accepted), and for those rejected we hope we provided clear and reasonable

							<p>explanation why they are not acceptable. At this step we did not put too much effort in formatting, which will be taken care in a later phase and during the publication process.</p> <p>The issues raised in this general comment have been addressed through addressing numerous specific comments provided by the SSCs' members.</p>
2	1.3	<p>1.3. Decommissioning actions involve decontamination, dismantling and removal of structures, systems and components (SSCs), including management of radioactive waste and radiation protection. These actions are carried out to achieve a progressive and systematic reduction in radiological hazards during decommissioning and are taken on the basis of planning and assessment to ensure safety and protection <u>of the workers, the public and the environment</u>, and to demonstrate that the facility meets the planned decommissioning end state.</p>	For clarification	X			
3	1.6	<p>A decommissioning project starts once a project organization is established.</p>	Due to the diversity of types of nuclear facilities, the statement is not applicable universally to all installations mentioned in the DS452 (e.g. spent fuel stor-	X			

			age facilities).				
4	1.7	However, there are still some existing facilities close to the end of their operational life or already permanently shut-down, which do not have a decommissioning plan in place, so for such facilities there is a need to develop a final decommissioning plan <u>should be developed</u> as soon as possible.	This document is intended to provide guidance on how manage decommissioning and not to give requirements.	X			
5	1.10	[4,5]	Quotation 5 will be replaced by DS 442. We assume that quotations will be updated in the final version.	X			
6	1.18	If removal of operational waste and spent fuel is not possible prior to decommissioning, it should be reflected in the final decommissioning plan and should be performed under the decommissioning license <u>or a separate operational license if still used for the storage of operational waste and spent fuel</u> , usually as the first phase of decommissioning.	It is for example not necessary to replace the license for the intermediate storage of nuclear fuel in the NPP. It is possible to use the operation license for the operation of the SSC for cooling the nuclear fuel and have an additional license for the decommissioning activities. This could be helpful for a fast start of decommissioning.		X		Please see revised text which accommodates two comments to the same sentence (ENISS and USA)
7	2.2	A R adiation protection programme should be included as part of the decommissioning plan and should be based on the national requirements for radiological protection	To have one programme for the whole decommissioning will not be appropriate. The radiation protection measures are manifold and specific and depend of the detailed decommissioning work.		X		Here we speak about RP plans/programmes and not about the implementation of RP measures. RP can't be included in the decommissioning plan, DP can only include an RP plan or RP programme or description of RP measures/arrangemen

							ts. Modified text tries to make it clear.
8	2.3	Although the principles and aims of radiation protection during operation and during decommissioning are fundamentally the same, the methods and procedures for implementing the radiation protection may differ due to the change of physical conditions of the installation during decommissioning, access of activated components <u>or contaminated equipment or areas</u> and removal of SCs	For Fuel Cycle facilities, contamination is a major hazard during decommissioning	X			
9	2.4	A multilevel system of sequential, independent provisions for protection and safety (defence in depth), that is commensurate with the likelihood and the magnitude of the potential exposures, should be maintained.	We propose deleting this paragraph. According to the IAEA standards, the defence in depth concept is mainly used for safety provision of NPPs/RRs during operation (or during design, construction). Decommissioning means that SCCs will be dismantled, barriers will fall, redundancies will be reduced resulting in a state where defence in depth is the exception. However has to be tolerated as the aim is dismantling and the state occurs only temporarily.			X	Defence in depth means application of more than one protective measure for a given safety objective, such that the objective is achieved even if one of the protective measures fails. We think this concept is applicable to decommissioning.
10	2.5	An example of an incident where protection of workers should be considered may include workers having to work closely to contaminated components being dismantled that could lead to a significant exposure <u>or spread of contamination.</u>	For Fuel Cycle facilities, contamination is a major hazard during decommissioning	X			

11	2.9	The licensee should indicate in the final decommissioning plan how compliance ,control and surveillance during decommissioning, and after its completion, if needed	No monitoring should be needed after the completion of the decommissioning process			X	Decommissioning end point could be release with restrictions, so monitoring may be needed even after completion of decommissioning.
12	2.9	The licensee should indicate in the final decommissioning plan <u>environmental impact assessment</u> how compliance with applicable requirements for protection of the environment will be ensured, including responsibilities and measures for monitoring, control and surveillance during decommissioning and after its completion, if needed.	The compliance with the requirements for protection of the environment should be addressed in the environmental impact assessment rather than in the decommissioning plan.		X		According to the IAEA approach, the final decommissioning plan is the main licensing document and it summarizes or provides reference to the EIA. Please see the revised text.
13	2.13	Regulatory oversight should be performed by the regulatory body during decommissioning. The frequency and scope of inspections should be established to be consistent with the intensity of decommissioning actions and associated risks, and can be significantly reduced during periods of safe enclosure.	More frequent oversight does not necessarily make a project safer. On the contrary it may hinder the work.			X	We disagree; it is a practice regulatory body should focus on actions with higher risk. This is also reflected in 2.14.
14	3.11	Interested parties must be given an opportunity to comment on the final decommissioning plan and safety related supporting documents before the license is granted, <u>on the basis of national regulations</u>	To be consistent with GSR part 6 point 3.3	X			

15	3.12	The regulatory body should develop procedures <u>guidance</u> that the licensee is expected to follow in preparing the license applications, as well as guidance on how the licensee could ensure the criteria and requirements are met so the decommissioning license can be terminated.	For clarification	X			
16	3.14	In order for decommissioning to be performed in a safe and efficient manner, the regulatory body is required <u>to contribute to the definition of the identified funding mechanisms</u> that can be used to ensure that appropriate funds will be available when needed. The amount of funds needed and the timeline for the expenditure of the funds should be based on a decommissioning cost estimate.	The definition of the funding mechanism may be the responsibility of other Governmental organizations	X			The explanation (reason) of your comment was found appropriate to be introduced as a footnote.
17	3.15	On-site inspection is one of the elements of the regulatory regime. and a significant portion of the body's resources should be allocated to this task The regulatory body should develop an inspection programme, which should include the following key elements: a system of prioritizing inspections; on-site visits of inspectors; review of radiation safety assessments made by the licensees; investigation and follow-up of events; and submission of information on compliance with safety criteria by licensees.	The authority–licensee relationship should be based on trusting each other, not on constant inspection.	X			

		If not regulated separately, the inspection programme should include industrial safety elements as well.	Industrial safety is outside the scope of the document.			X	We do not provide detailed guidance on industrial safety aspects, but it is appropriate to emphasize its importance during decommissioning.
18	3.17	The regulatory body should ensure that existing enforcement policy, addressing radiological health and safety and protection of the environment, covers decommissioning aspects. The regulatory body should issue detail procedures for determining and exercising enforcement actions, as well as the rights and obligations of the licensee.	No detail procedures are ever issued by the regulatory bodies. Rights and obligations of the licensee are defined by the law.		X		Here we discuss internal procedures of the RB for its activities.
19	3.18	The regulatory body inform the public and interested parties about the key decisions with regard to decommissioning of nuclear installations for the purpose of transparency and in order to address public concerns related to safety of decommissioning. Information should be provided to interested parties as soon as they are available [25]. <u>In addition, the regulatory body should get involved and implicated in public consultation (roundtables...) in order to answer public's questions and concerns.</u>	Licensees and regulatory body should together participate in public enquiries.	X			
20	3.22	In preparing for decommissioning, the licensee may perform activities such as removal <u>of spent fuel</u> , operational and historical waste stored on-site during operation.	For completeness	X			

21	3.23	The licensee is responsible for maintaining ensuring that trained and qualified workers are available to safely conduct decommissioning actions...	The text implies that the resources must be part of the licensee organization which is unfortunate, Since in many cases a large part of the practical work will be performed by contractors.	X			
22	3.24	<u>Add text or explain why these items have not been addressed.</u>	Several aspects of the requirement 6 are missing in this chapter. For instance EIA and REIA, Emergency plan, radiation survey.		X		We agree with the observation. The only reason is to avoid too much of repetition. Basically, the same things are listed under the responsibilities, and then are explained again under management, strategy, financing, planning, conduct and termination sections. We are not sure if such explanation should be included in 3.24 (3.26 in the revised version).
23	4.1	The licensee must should establish, implement. The management system must should cover...	Text is written as requirement, which needs a correct link to the GSR Part 6 or modification to should form.	X			
24	4.5	Within the integrated management system, safety is the most important objective factor, overriding all other factors . Safety management refers to those aspects of the management system that are put in place to ensure that an acceptable level of safety is maintained; including radiation protection and safe-	Safety is top priority of operations while for a management system top priority is quality.	X			

		ty during decommissioning.					
25	4.7	A fundamental principle For the effective management of safety is the appointment of experienced managers <u>is important</u> , with the lead in safety matters coming from the highest levels of management.-	Involvement of staff in all levels could give better results.	X			
26	4.15	<input type="checkbox"/> Radiation protection	Already written just above the bullets (no need to repeat in a bullet)			X	The bullet list refers to more detailed (specific) training, while the text above talks about general training for all personnel.
27	4.17	For decommissioning of a complex nuclear installation it is beneficial sometimes to conduct the project using a multi-phased approach, for example progressing from “low hazard” areas to “higher hazard” areas of the installation. From a training point of view, such approach enables gradual development and improvement of decommissioning skills and experience, whilst reducing potential risk to decommissioning workers. <u>Another theory is to remove the most radioactive materials first to create a better radiological working environment for subsequent phases.</u>	To demonstrate that also the other way round is a decommissioning option.	X			
28	4.20	Each work procedure should be sufficiently detailed, so a qualified individual is able to perform the required actions. without direct supervision	There is no direct line between performance of a task and supervision.	X			
29	4.25	Daily <u>Periodical and adapted on the</u>	Daily is not fitting for all de-	X			

		<u>complexity of the decommissioning actions</u> briefings should be performed as they are an integral part of controlling decommissioning actions.	commissioning actions. Some are so easy to understand that a daily briefing is counter-productive others are so complex that daily is not strong enough.				
30	5.4	In this context, release without restrictions should be the preferred end state and ultimate objective of decommissioning, <u>when a final repository is available.</u>	When there is no final repository the remaining waste has to be stored and this will be preferably done at the site to avoid unnecessary transports.	X			
31	5.4	...when decision for permanent shutdown is taken by the licensee. Immediate dismantling is the preferred strategy... ultimate objective of decommissioning.	Remove part that describes preferred strategy and end state. It must be up to the licensee to decide, complying with country regulations, which strategy and end state that is the most suitable for them.			X	Rejected, according to the IAEA approach immediate dismantling is a preferred strategy (first sentence of para 5.1 of the GSR Part 6).
32	5.5	A justification for selection of particular strategy <u>should be</u> must be provided	Written as a requirement.	X			
33	5.5	Any strategy which involves waiting periods should strongly be justified in terms of safety, management of decommissioning waste and radiation protection issues.	We have an opinion that the guide should be written in the neutral form without augmentative elements.	X			
34	5.8	<input type="checkbox"/> Availability of infrastructure for radioactive waste management <u>including waste disposal</u>	To be consistent with point 5.42 (availability of waste disposal is an important factor influencing the strategy)	X			
35	5.10	As discussed in the chapter 6 of this Safety Guide, the financial arrangements for decommissioning should be established early during the lifetime of the nuclear installation to enable safe	Safe decommissioning is including that issue naturally. It is not necessary to accentuate this in this way that only the reducing costs are the driving factors			X	We think it is important to make this statement explicitly.

		decommissioning in a timely and efficient manner; so lack of financial provisions should not be a driving factor when selecting a decommissioning strategy.	for nuclear installations.				
36	5.11	The licensee should check at regular intervals if the decommissioning strategy is still appropriate. Updates of the final decommissioning plan and supporting safety documentation (e.g. safety assessment for decommissioning) during conduct of decommissioning should reflect the progress of the work, the continuous removal of the generated waste and the evolution of radiological and physical status of the installation, in order to demonstrate that a safe configuration is maintained at all times and that the decommissioning project is still aligned with the decommissioning strategy selected.	Difficult to imagine that the decommissioning strategy, once selected, may change. In any case sentence not pertaining to the paragraph.			X	There are examples when initially selected strategy has been changed, as it was not appropriate anymore.
37	5.13	Optimization of decommissioning action across the site and their sequence using pooled resources and skills as appropriate, to avoid underutilization of workers.	A multi-facility site may have different owners/licensees of the facilities; it is not feasible to adopt this recommendation across the entire site.		X		Modification made in the text to address your comment, but to keep the idea, if here is a single owner.
38	5.18	Accident <u>or incident</u> situations may lead to a spread of contamination outside of the building of the nuclear installation.	Both situations should be considered.	X			
39	5.35	...when selecting a decommissioning strategy, the licensee should...	A forgotten "e" changes the meaning of the paragraph	X			
40	5.38	The availability of existing systems and infrastructure (e.g., air supplies, ventilation systems, overhead cranes) <u>and considerations on their aging</u> may make	Systems available at the end of operational life may become not usable in case of deferral of decommissioning due to aging	X			

		immediate dismantling advantageous due to maintenance upkeep or recertification of the component at a later time.	or change in acceptable standards (ex. cables with PVC)				
41	5.41	The environment around the installation may have changed since the building was constructed. An example might be the encroachment of other university buildings around a research reactor building that was once on the edge of a campus and relatively isolated. An example might be the change in environmental conditions such as the raising of water levels making deferred dismantling unfeasible.	Repeats 5.26	X			
42	5.42 (a)	Overall National waste management policy	Wording – the term national waste management policy is used in the DS 452.	X			
43	6.2 (a)	Add after 6.2 (a) <u>(a) bis: Operational radioactive waste and spent fuel management and final disposal....</u>	Mentioned in 1.18 but missing here			X	Addressed in 6.3.
44	6.4	It is important for the decommissioning cost estimate to distinguish between operating expenses and decommissioning expenses.	It is not important to distinguish these expenses.			X	It is essential to make clear distinction between actions for which decommissioning fund can be used and the actions which are paid from other funds, especially during transition.
45	6.10	The mechanism by which financial assurance is guaranteed should be robust, so that it will withstand changes in government (for government owned and financed facilities), changes in ow-	This cannot be handled. The amount of funds needed should be assessed on the basis of a given and realistic operation time.	X			

		nership of a private company, especially following sale of the company to a party that is resident outside of the State, or changes within financial institutions (where financial assurance is guaranteed, e.g., by a bond secured by the financial institution). This mechanism should be sufficiently robust to provide for decommissioning needs in the event of a premature shutdown of the installation.					
46	7.4	For many nuclear installations, operating for many years, decommissioning may not have been considered at the design stage or during construction and subsequent operation. For these installations, planning for decommissioning should start as early as possible. <u>7.4 (a)</u> Furthermore, in addition to planning for decommissioning, possible modifications to buildings and systems during the remaining operational lifetime should be used to incorporate features that will facilitate decommissioning, for example use of components made of materials resistant to activation, introduction of purification systems to reduce spread of contamination or creation of access points for easier decontamination of hot cells.	Separate the paragraph 7.4 into two as the second one is relevant advice to installations of any age.			X	The second part also addresses operating facilities for which decommissioning has not been considered at the design stage (modifications to buildings and systems during the remaining operational lifetime to compensate lack of design considerations).
47	Section 7 page 34	Move paragraphs 7.5 until 7.9 included at the beginning of the section and introduce also in figure one the concept of a preliminary decommissioning plan	To give more evidence to actions to be done at the design stage that is demonstrations that all design features that may facilitate decommissioning are			X	Not clear where to move paragraphs 7.5 and 7.9. We do not think additional concept of a preliminary

			put in place. Anyhow, in particular for standard designs, some information required for a specific decommissioning plan could not be available. As a consequence it would be useful to introduce a new document. Actually could have the same index than the preliminary decommissioning plan excluding sections dealing with waste estimate and disposal strategies.				decommissioning plan (PDP) is needed. The IDP and the FDP have clear roles in the licensing process, and in between there are many updates of the plan, so no single PDP exists.
48	Figure 1 page 35	Title of figure 1 to be renamed as follows: <u>Example of</u> decommissioning plans...	In some countries, the decommissioning plan is not the leading document.	X			
49	7.11	During operations, the initial decommissioning plan has to be reviewed and updated periodically, typically every five years or as prescribed by the regulatory body according to the national regulatory framework. Other reasons <u>which may lead</u> to update the initial decommissioning plan include:	Five years are completely arbitrary and not reasonable. It makes more sense to connect the review with the planned lifetime of the plant. These reasons should not systematically need an update of the decommissioning plan (depending of their impact on the decommissioning plan)		X		First part not accepted, as it is consistent with para 7.5 of the GSR Part 6. Second part is accepted.
50	7.13	A Waste management plan should be part of the initial decommissioning plan and should include information about the waste management approach to be applied.	It is too formal to require a waste management plan, which was not mentioned in the Requirements GSR Part 6.			X	Information on how the waste generated during decommissioning will be managed has to be provided somewhere. In the IAEA approach we call this document WM plan. It can be a stand-alone document which is referenced

							or summarized in the FDP, or can be included into the FDP. Anyway, this document should be a part of the licensing package for decommissioning.
51	7.16	During decommissioning, records should be maintained of key decommissioning actions. For example, accurate and complete information concerning the quantities and types of radionuclides remaining at the installation, their locations and distributions, and the volume of radioactive waste generated. These records could be used to demonstrate that all radioactive materials, that were present at the beginning of decommissioning, have been properly accounted for and that their final dispositions (e.g. restricted reuse or disposal) have been identified and confirmed. Documentation should also account for materials, structures and land that have been removed from regulatory control.	Repeated again from 7.14		X		Paragraph moved to section 8 (now 8.22, as it deals with records generated during conduct of decommissioning).
52	7.18	Move to chapter 3 The regulatory body should ensure that relevant plans, records and reports (addressing decontamination, demolition and dismantling actions, as well as surface, groundwater, soil and sediment remediation, and the final radiological survey) are prepared by the licensee, and retained for an appropriate timeframe.	This statement refers to authorities Requirement 5		X		This paragraph has been moved to 9.16, to accommodate a comment from Japan. We agree this paragraph refers to the responsibilities of the regulatory body. But at the same time it deals with records to

							be retained after completion of de-commissioning, so there is a basis to move it to Section 9.
53	7.19	During the operation of the nuclear installation, operational radioactive waste should be properly managed and promptly removed <u>to the existing final repository</u> , to the extent practicable, from the premises of the nuclear installation to simplify transitioning to de-commissioning.	Removal is only appropriate if a repository exist. Otherwise the storage at the site should be the preferred option.		X		Slightly revised text proposed, but the idea of the comment fully accepted.
54	7.20	The transition period should be as short as practicable.	The transition period depends on a number of factors. E.g. spent fuel has to decay at least 5 years to drop the heat load. Activated parts may benefit for decay, e.g. regarding Co-60.			X	We agree the duration depends on a number of factors, but still it should not be extended beyond the minimum practicable.
55	7.20	The transition from operation to de-commissioning starts after the permanent shutdown of the nuclear installation. The transition period should be as short as practicable. The end of the transition period is defined by the date of granting the decommissioning license or approval of the final decommissioning plan <u>or any other authorisation for decommissioning</u> .	To have a defined legal reference point this may be different in different countries.	X			
56	7.26	It is a good practice if, B before submission of the final decommissioning plan and the safety assessment to the regulatory body, these and other selected supporting documents are <u>may be</u> subject to an <u>internal</u> independent review	There are doubts that this review is good practice. For clarification.	X			

		performed under the responsibility of the licensee. The purpose of this independent peer review is to provide confidence to all stakeholders that the proposed tasks are feasible and that suitable and sufficient safety controls have been identified.	To achieve confidence to all stakeholders is simply not possible.				
57	7.32 and 7.41	Phase 7: <u>Final</u> Conventional removal activities (e.g. demolition of radiologically clean buildings).	To clarify that during the whole decommissioning activities conventional removal activities are possible.	X			
58	7.34	In some decommissioning projects it may be advantageous to ship <u>remove</u> large components, e.g. steam generators from nuclear power plants, <u>as a whole outside the facility building or to ship</u> them to another facility away from the site for further segmentation and treatment.	The basic aim is to remove the large parts to safe time in the further dismantling of the plant. The dismantling of the large component can be done years later to allow for decay and the location may be at the site of the decommissioned plant or elsewhere.	X			
59	7.37	Introduction of “new” techniques may require specific analysis to assess the <u>suitability and</u> the safety of the new technique or equipment and to implement adequate controls, and also may require additional training of the personnel.	The suitability of the technique has to be cleared first.	X			
60	7.39	While the bulk of the <u>radioactive</u> waste from nuclear power plants will be..	The bulk of the waste from decommissioning will be conventional waste.	X			
61	7.44	A surveillance and maintenance plan for the safe enclosure period is based on the outcomes of the safety assessment. It should consider aging and obsolescence aspects of the SSCs. The safety assessment for the deferred dismantling strategy should be the basis	See comment on 5.38	X			

		for establishing the safety parameters (e.g. temperature, humidity, containment, and discharges to the environment,) which should be maintained by means described in the surveillance and maintenance plan. Corrosion and brittle fracture of materials, as well as <u>aging</u> and obsolescence of materials (spare parts) are typical issues to be considered carefully					
62	7.47	According to national requirements, interested parties may be involved in the licensing process for decommissioning, as well as in the process for termination of decommissioning license by providing comments before decisions are taken by the regulatory body and prior to granting or terminating a decommissioning license.	Firstly, decommissioning licenses should not be terminated at all. Each decommissioning project is unique and the actual course cannot be predicted with certainty. There are examples where even after 20 years of decommissioning an endpoint cannot be predicted. To participate interested parties in a process for termination of a license is questionable. Termination of a license means that there are no longer radiation risks at the site, no effluents etc. So the end state is completely safe from radiation point of view.			X	Once decommissioning project reached its end point, there is no reason to keep the decommissioning license. If there are remaining risks and associated restrictions after completion of decommissioning, such situation can be controlled by other means of institutional control or regulatory authorization/license, but such situation is not decommissioning anymore.
63	7.49	Public inquiries or consultations should be organized ... to give comments on <u>for example</u> the final decommissioning plan and appropriate supporting documents. ...	In some countries, public consultation is conducted when preparing the environmental impact assessment, not when preparing the decommissioning plan.		X		The idea accepted, but alternative wording proposed.
64	8.1	Conduct of decommissioning involves implementation of the decommission-	Already mentioned several times. 7.23	X			

		ing strategy and related actions, as described in the final decommissioning plan. The final decommissioning plan is the version of the decommissioning plan submitted for approval to the regulatory body prior to its implementation.					
65	8.23	During periods of intensive decommissioning actions <u>there should be increased focus on coordination of activities on the site.</u> inspections should be increased and coordinated to coincide with actions taking place that have a high potential safety impact, such as movement of large components and size reduction activities. Inspections during this period might focus on topics such as: exposures to workers, contamination control, nuclear material flow control,....	There should be increased focus on coordination of activities on the site, instead. Increased number of inspections does not necessary increase safety of operations.			X	Please see the resolution of the comment 13 on para 2.13.
66	8.29	A waste management plan that covers all the anticipated decommissioning waste streams and categories should be developed. The <u>licensee</u> waste management plan should define the manner in which material will be removed from the nuclear installation and the manner for segregating radiological from non-radiological and hazardous waste.	To have a management plan is not foreseen in the requirements document GSR Part 6.			X	The comment is correct, but the decommissioning plan should address the management of decommissioning waste, so the guidance recommends having a WM Plan.
67 VGB to check	8.30	If existing waste processing systems cannot cope with the waste generated during decommissioning in the volumes <u>or types of waste</u> expected, the construction of new facilities	During decommissioning arise new types of waste.	X			
68	8.31	“... Licensees should ensure that the	In some countries the waste		X		We agree that the

		waste management plan, which is part of the decommissioning plan, is implemented and maintained”	management plan is considered part of the safety assessment, not the decommissioning plan.				WM Plan can have a different position in the licensing package of documents for decommissioning (part of the FDP or the SA), but the point is that a WM Plan is needed.
69	8.36	Provisions for timely management of the operational waste should be elaborated prior to the permanent shutdown, and discussed with the regulatory body and other interested parties in accordance with national requirements.	There is no reason to participate interested parties as this is a task within the current license for operation. The question how to deal with waste at all will strongly be determined by the existence or non-existence of a final repository. Most countries do not have a repository and the waste will remain at the site, irrespective if it is operational or decommissioning waste.	X			
70	8.37	In such cases, the removal of the remaining waste and materials should be addressed in the final decommissioning plan and associated waste management plan.	GSR Part 6 does not demand a management plan.			X	Please see the resolution of the comment 66.
71	9.2	The final decommissioning report should summarize the final status of the former nuclear installation. The final physical and radiological status of the remaining structures of the nuclear installation, if any, and/or the site at the time of release from nuclear regulatory control or at the time of conversion to other (nuclear) use should be described. A summary or reference to the results	A review of the EIA may be performed in case of post-accident decommissioning when significant radiological restriction is envisaged. We propose to delete this text due to the fact that DS 452 does not reflect post-accident remediation. There is no added value in do-			X	First point: DS 452 tries to provide some guidance for post-accident decommissioning (1.17, 5.15-5.17, 6.11, 7.52-7.54). Second point: We agree that there is no regulatory decision to

		of the radiological survey report should be provided. Furthermore, it should address any remaining restrictions on the site, if they exist. A review of the environmental impact assessment may be necessary considering the final radiological status of the former installation, as required by national requirements. The final decommissioning report should summarize the activities performed during decommissioning, and should also provide additional project information, as appropriate.	ing this. Decommissioning projects may last over decades and many data about the early stages are worthless as techniques have developed, regulations may have changed etc.				be made on the basis of this part of the final decommissioning report. The regulatory decision is made on the basis of the final survey report. But the IAEA considers it is important to summarize the project and to comment on what went well, what were the surprises and difficulties and how they were resolved (lessons learned). We consider the final decommissioning report is a good place for such a summary, so we recommend that the final decommissioning report include additional information, as described in the Annex II.
72	9.7	The final radiological survey report is submitted to the regulatory body for approval. The results of the survey will be a major portion of the final decommissioning report.	According to point 9.3, it is the final decommissioning report which is submitted to the regulatory body ; as it includes the results of the survey, it is not necessary to submit two documents to the regulatory body		X		The idea of the comment is accepted, but alternative wording has been proposed, please see the revised text.
73	9.9	The regulatory body should use both in-process surveys and confirmatory surveys. In process surveys are typically done side by side with the licensee,	The procedure of independent sampling is already described with sufficient detail in 9.8.		X		Last sentence of 9.9 kept and merged with 9.8.

		and serve to confirm the validity of their final survey process. Confirmatory surveys are done after the licensee has completed survey work and submitted a final radiological survey report. In doing confirmatory surveys, it is not necessary to repeat every survey sample, as the purpose is to provide additional assurance that the site end state condition is not inconsistent with the final decommissioning plan. These surveys should be conducted by experts with special training in this field.					
74	9.12	Any deviations from the end-state, as described in the final decommissioning plan, should be clearly identified, their consequences should be assessed, and a new end state should be described in an update of the final decommissioning plan (for example, when waste storage facilities remain on a part of the site under a new license, with possible transfer of responsibilities to a separate licensee). This update should be approved by the regulatory body.	As it is addressed in the final decommissioning plan which is submitted to the regulatory body, it is not necessary to update the decommissioning plan to submit a second document to the regulatory body ; the case of waste storage facilities remaining on site is addressed clearly in point 9.18		X		We consider a change of the decommissioning end-state, and the way the site is going to be reused after decommissioning, is a crucial decision and has to be properly documented and approved by the regulatory body. If additional actions are needed to achieve the revised end-state, the final decommissioning plan should be updated and the update should be approved. Please see the revised text.
75	9.14	If restrictions are necessary for access to or for the use of the remaining parts of the nuclear installation or site, the regulatory body needs to ensure that an	Not only radiological restrictions could be actual	X			

		appropriate mechanism is in place to demonstrate compliance with these restrictions for radiological control					
76	9.18	... If spent fuel remains on-site, guidance found in [10] should be applied. In that case, the licensee of the waste storage facility should periodically report to the regulatory body detailing the radioactive waste inventory, monitoring, transportation and disposal. Moreover, information such as radiological surveys, effluent and environmental monitoring and personnel exposure monitoring data should be reported to the regulatory body, as required. A decommissioning plan for the new waste storage facility must be prepared.	Refer to documents regulating these kinds of facilities.		X		The last sentence about planning for decommissioning of the storage facility that remains on the site has been kept.
77	9.19	The regulatory body should perform periodic inspections of the waste storage facility to ensure compliance with regulatory requirements and to ensure that material condition of the facility and waste is being maintained.	Refer to documents regulating these kinds of facilities.	X			
78	9.22	Comments from interested parties, e.g. the public, must be obtained and addressed before the license for decommissioning is terminated. Appropriate consideration should be given to the communication with the public, especially if the end state is release from regulatory controls with restrictions.	No public involvement in license termination. See even 7.47			X	The guidance is in line with para 9.6 of the GSR Part 6.
79	Annex 2	4. Provide information on radiation exposures to workers	This information has no value. Each project differs. During decommissioning the RP law			X	We strongly disagree that the information on occupational ex-

			has to be complied with, that's all.				posures does not have value in the context of final decommissioning report. The objective of the Safety Standards programme is to protect people and the environment from the harmful effects of the ionizing radiation. In the decommissioning plan predictions of the exposures are provided (dose assessment). The predicted values should be compared with the final real values.
80	Annex III 1.a	Summary of the survey, <u>including comparison with the initial radiological survey.</u>	In order to demonstrate that final status is reached a comparison would be useful.	X			

Finland's comments on DS452 Decommissioning of Nuclear Installations

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: WASSC Country/Organization: STUK, Finland Date: 16 Oct, 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	Please condense the text.	A lot of repetition in the text.	X			We made an effort to reduce the repetitions in the text. Numerous comments have been requesting to delete particular repetitive sentences.
2	p. 12, para 3.4 and para 3.6		Occupational safety is missing from the list in para 3.4.	X			If your point was related to conventional (industrial) safety, then please see the revised text, which includes it in both 3.4 and 3.6. If you refer to "occupational exposure" and "occupational RP", we understand they are covered by "radiation safety".
3	p.13-14, para 3.8, 3.13 and 3.14	3.8 "The regulatory body is required to should give..." 3.13 "The regulatory body is	This is a safety guide document so all recommendations that are not written in the	X			

		required to should review...” 3.14 ”In order for decommissioning to be performed in a safe and efficient manner, the regulatory body is required to should identify...”	requirement document should use word “should”.				
4	3.11	“Interested parties must should be given an opportunity to comment on the final decommissioning plan and safety related supporting documents before the license is granted. “	See previous comment. In addition, public participation is not more important than the other requirements/recommendations.	X			
5	3.14	” In order for decommissioning to be performed in a safe and efficient manner, the regulatory body is required to identify funding mechanisms that can be used to ensure that appropriate funds will be available when needed. ”	How is this a task of the regulator? GSR Part 6 Req 5. says that the responsibilities of the RB shall include ” establishing requirements for financial assurance for decommissioning and for a mechanism to ensure that adequate resources will be available when necessary for safe decommissioning, in the case where the government has delegated this to the regulatory body; “. Identifying funding mechanisms should be divided between the government (to set a law for managing finances)	X			Please see the revised text and the footnote 7, which accommodates similar comment from ENISS and Argentina, and also see the explanation related to their comments.

			and licensee (to gather the funds), not the regulator. The regulator may assess whether the funds gathered by the licensee are appropriate.				
6	Chapter 4. Req. 7. Integrated management system for decommissioning	This Chapter is well written but it is also very long. It is proposed here to make it shorter and included most of the text to DS477 which concerns management systems for handling, storage and disposal of RW.	DS477 (Management system for predisposal and disposal of radioactive waste) is meant to cover all other aspects of RWM except decommissioning, however, it could be applied to decommissioning as well to be an integrated system and avoid repetition of the recommendations.			X	The comment does not indicate which parts of the text are proposed to be removed from DS452 to DS477.
7	p. 24, para 5.7.	”Decommissioning, whether based on an immediate or a deferred dismantling strategy, should commence shortly after permanent shutdown.”	Contradiction; deferred dismantling is not meant to commence shortly after permanent shutdown, it may take years (with good reasons for that).			X	Even if deferred dismantling strategy is selected, there are some decommissioning actions performed early in order to prepare the facility for safe enclosure (limited dismantling, decontamination, closing openings, modifying systems,...). Please

							see the example in 7.41.
8	p.55 para 8.35	Add information about the material/item/components the waste package contains to the list.	relevant information	X			

**Draft Safety Guide DS452 “Decommissioning of Nuclear Installations”
(Version dated 1 September 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 and BfS) Country/Organization: Germany					Page 1 of 22 Date: 2014-10-17			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1	General	This document will be published as a Safety Guide. In numerous paragraphs, however, there is a mixture of statements using “should”, “have/has to be”, “is/are to be”, “must be” or “need to be”. This often leaves the reader confused and is not the appropriate style of writing a Safety Guide. IAEA’s approach to provide “shall” statements in Safety Requirements and “should” statements in Safety Guides, which is consequently applied throughout all existing Safety Standards publications, seems to be violated in DS452.	Clarification is required. One approach should be defined and used consistently throughout the document. In GSR Part 6, more details regarding a certain requirement are given in the subsequent paragraphs. It is not necessary to repeat them in DS452.	X			Excellent and very useful comments have been provided by Germany. We carefully considered all of them and tried to resolve them in a way consistent with the decommissioning approach recommended by the IAEA. We accepted most of the comments (please consider “accepted with modification” as accepted), and for those rejected we hope we provided clear and reasonable explanation why they are not acceptable. The issues raised in this general comment

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								have been addressed through addressing numerous specific comments provided by the SSCs' members.
1	2	General	<p>As DS452 will be established as a Safety Guide, this document shall not contain any requirements without proper quotation of the overarching Safety Requirements publication (GSR Part 6) and clear separation from the subsequent recommendations and guidance provided. Should the IAEA Secretariat have decided to quote the overarching requirements in all future Safety Guides, we strongly recommend to harmonize the format and layout of such quotations. In our opinion, the Draft Safety Guides DS447 and DS448 on predisposal waste management provide an acceptable proposal, which could be adopted in DS452 as well, for example (only for illustration purposes):</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Requirement 12 (GSR Part 6, Ref. [1]): Conduct of decommissioning actions</p> <p>The licensee shall implement the final decommissioning plan, including management of radioactive waste, in compliance with national regulations.</p> </div>	One approach should be defined and used consistently throughout all future IAEA Safety Guides.	X			At this step we did not put too much effort in formatting, which will be taken care in a later phase and during the publication process.
3	3	Contents	<p>“... 3. RESPONSIBILITIES ASSOCIATED WITH DECOMMISSIONING 4. MANAGEMENT OF DECOMMISS-</p>	Missing section in the table of contents.	X			

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			<u>SIONING</u> 5. DECOMMISSIONING STRATEGY ...”					
3	4	1.1	1 st sentence: “With the maturing of the nuclear industry <u>in the past decades</u> , many States have <u>constructed and commissioned</u> facilities that use radioactive materials or sources in a variety of applications were constructed and commissioned in the past. ”	Proposed modification of wording with the objective to improve the readability and comprehensibility of the entire sentence.	X			
3	5	1.2	1 st sentence: “As defined in <u>the IAEA Safety Requirements GSR Part 6</u> [1], “Decommissioning refers to administrative and technical actions taken to allow removal of some or all of the regulatory controls from a facility ...”.”	Clarification. In the introducing part of this Safety Guide, the most relevant publications should be designated, and the important terms and concepts may be explained a bit more than later on.	X			
1	6	1.5	“ <u>Depending on the national regulatory system, decommissioning of nuclear installations might be subject to the granting of a decommissioning license or an authorization to perform decommissioning actions in the framework of a license granted for the whole lifecycle of the facility. In this Safety Guide, the term “decommissioning license” is used for both regulatory concepts. For large and complex facilities, which are the subject of this Safety Guide, the authorization for decommissioning usually takes a form of a license. Thus in this Safety Guide the term “license for decommissioning” is used instead of “authorization for decommissioning”.</u> ”	The scope of this Safety Guide covers nuclear installations. Whether a license or an authorization for decommissioning is needed, depends on the national regulatory regime more than on the size and complexity of the installation. Within this document, the terms ‘decommissioning license’ and ‘license for decommissioning’ are used interchangeably. Please decide on one term to use throughout the document.	X			
3	7	1.19	Last sentence: “This Safety Guide does not explicitly	The word ‘during’ refers to a time span.		X		The intention was to refer to aspects (planning, conduct,

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			address non-radiological hazards, but they need to be given due consideration during all aspects <u>phases</u> of decommissioning.”					completion/termination, as defined in the GSR Part 6. The text has been modified: “... in all aspects of decommissioning”.
2	8	2.1	1 st sentence: “The principles of radiation protection and safety for radiation sources are provided in IAEA Safety Standards Series publications [4, <u>34</u>].” Add Ref. [34] to the list of references: “ <u>INTERNATIONAL ATOMIC ENERGY AGENCY, Occupational Radiation Protection, IAEA Safety Standards Series No. xxx (DS453), IAEA, Vienna (in preparation)</u> .”	Please add a reference [34] to the Draft Safety Guide DS453 “Occupational Radiation Protection” which is relevant here.	X			
2	9	2.3	1 st sentence: “... the methods and procedures for implementing the radiation protection may differ due to change of physical conditions of the installation during decommissioning, access to highly activated components <u>and contaminated areas</u> , and removal of SSCs.”	Experiences from decommissioning projects gained in many States show that contamination is a major radiological hazard during the decommissioning of nuclear fuel cycle facilities.		X		Similar comment from ENISS, their formulation accepted.
3	10	2.5	Last sentence: “... to achieve enhanced resistance of the protective gloves to puncture, in order to avoid injuries with internal contamination <u>due to intakes of radionuclides</u> .”	Consistency with the terminology used in the IAEA Safety Glossary (2007 Edition).		X		The intention was to mention injuries which are then a pathway for intake of radionuclides, and not injuries as a consequence of an intake (due to).
3	11	2.6	Last sentence: “Such issues are not addressed in this s Safety g Guide, as they are well addressed in other IAEA s Safety s Standards	In conjunction with the publications issued in the IAEA Safety Standards Series, ‘Safety Guide’	X			

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			[4, 22].”	should be used as capitalized term consistently throughout the document.				
2	12	2.12	2 nd bullet: “Identification of SSCs (already present or new ones), which are needed for the safe decommissioning of the nuclear installation and control requirements;”	Clarification added to point out which SSCs are of importance during decommissioning.	X			
3	13	2.14	1 st sentence: “Depending of on the nature and extent of the decommissioning actions to be performed, ...”	Grammar.	X			
2	14	2.15	1 st sentence: “During conduct of decommissioning, the licensee may implement an internal management system procedures to allow minor modifications of decontamination and dismantling techniques, which do not have a significant impact on safety. Such management system procedures should be approved and should be subject to oversight by the regulatory body prior to and during its implementation, according to national requirements.”	The integrated management system for decommissioning is dealt with in Chapter 4 of this Safety Guide. In order to avoid getting into conflict with this Chapter, modification of terminology is proposed here.	X			
3	15	2.16	2 nd sentence: “... new hazards which must be considered, for example use of cutting tools or generation of airborne contamination and secondary radioactive waste.”	Clarification and completion.	X			
2	16	2.18	“According to the complexity of decommissioning actions and the duration of decommissioning project, the final decommissioning plan may be supported by a single safety assessment for the entire project, or by an overarching safety assessment (umbrella assessment), which covers the entire project ...”	Wording. The term ‘umbrella document’ does not contribute to a clarification of the expected content of an overarching safety assessment. Moreover, it is not mentioned in the IAEA Safety	X			

				Glossary (2007 Edition) and used just once within this document.				
3	17	2.21	1 st sentence: “The results of safety assessments will determine which safety functions and related SSCs ... will no longer be needed after operations has ceased.”	Editorial.	X			
1	18	3.4	2 nd sentence: “It should be ensured that the regulation of all aspects of nuclear safety , radiation, nuclear , transport, and waste safety, industrial and environmental safety is covered adequately and that the responsibilities of the governmental bodies involved are clearly specified and allocated.”	Please add industrial safety to the listing since, in many States, nuclear safety and industrial safety are regulated by different authorities. As the word ‘nuclear’ would be a single adjective surrounded by nouns, a slightly modified wording is proposed.	X			
1	19	3.6	1 st sentence: “... it should be planned and managed on a case by case basis in consultation with the regulatory body(ies) having responsibility for nuclear safety , radiation, nuclear , transport, and waste safety, industrial and environmental safety.”	See our related comment on Para 3.4.	X			
3	20	3.9	1 st sentence: “The regulatory body should follow a consistent procedure for establishing, revising and revoking regulations and guides, involving stakeholders interested parties .”	The term ‘stakeholder’ would be slightly more general and it is the one used in the IAEA Safety Glossary (2007 Edition).			X	Safety Standards published recently do not use the term “stakeholder”. Both GSR Part 3 and Part 6 use the term “interested party”.
2	21	3.10	2 nd sentence: “The status of applicable requirements should also be examined in the light of the state-of-the-art of science and technology, e.g. new safety related develop-	The proposed amendment makes the statement more general.	X			

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			ments and lessons learned from national and international decommissioning experience.”					
3	22	3.13	1 st sentence: “The regulatory body should require notification by the licensee of any significant changes to the planned actions as described in the final decommissioning plan and that might have with an implication to safety of the decommissioning or to the final end state.”	Wording.	X			
3	23	3.18	2 nd sentence: “Information should be provided to <u>stakeholders</u> interested parties as soon as they are available [25].”	See our related comment on Para 3.9.			X	Safety Standards published recently do not use the term “stakeholder”. Both GSR Part 3 and Part 6 use the term “interested party”.
2	24	3.19	1 st sentence: “ <u>As stated in GSR Part 6 [1]</u> , the regulatory body must establish the requirements for ensuring that records important for the planning and implementation of the decommissioning activities are collected and retained.”	In a Safety Guide, usually recommendations (or “should” statements) are provided. Please add an introductory clause to emphasize that a requirement (or “shall” statement) is cited here (see Para 3.3 of GSR Part 6).	X			
2	25	3.22	1 st sentence: “In preparing for decommissioning, the licensee may perform activities such as removal of <u>spent fuel</u> , operational and historical waste stored on-site during operation.”	Amendment for completion.	X			
2	26	4.3	3 rd sentence: “General <u>requirements and</u> guidance on integrated management systems can be found <u>are provided</u> in other IAEA Safety Standards Series publications [26-28].”	In Ref. [26], the Safety Requirements GS-R-3 are cited. Strictly speaking, this publication do not provide guidance. Hence, wording	X			

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				needs to be adjusted (compare with the wording in Paras 1.10 to 1.12).				
2	27	4.12	4 th bullet: “Waste processing (i.e. pretreatment, treatment and conditioning) ;”	According to the IAEA Safety Glossary (2007 Edition), the term ‘processing’ is more comprehensive and includes ‘pretreatment’, ‘treatment’ and ‘conditioning’.	X			
2	28	4.14	1 st sentence: “When preparing for some decommissioning actions, specialized training may be needed, which involves the use of mock-ups, and models and computer-based simulations to ensure the actions can be carried out safely and incorporate lessons learned into the working procedures.”	Amendment to be in line with the guidance provided in Para 8.10.	X			
1	29	4.15	Last sentence: “Additionally, depending on the actions to be performed, some personnel should receive specific training in: <ul style="list-style-type: none"> • Installation’s design, and layout and zoning arrangements applied; • ... • Radiation protection [35]; • Practices and procedures for management of materials and radioactive waste; • ...” Add Ref. [35] to the list of references: “ INTERNATIONAL ATOMIC ENERGY AGENCY, Radiation Protection of Itinerant Workers, IAEA Safety Reports Series No. xxx, IAEA, Vienna (in prepara- ”	It is not clear what the term ‘zoning arrangements’ does mean. Does it correspond to ‘controlled area’, ‘supervised area’, ‘site area’ and so on ? These terms are summarized under ‘installation’s layout’. Further guidance is provided in the IAEA Safety Report “Radiation Protection of Itinerant Workers” which will be published soon. Please include a reference [35] to this report.		X		We can’t reference Safety Reports in the main body of the Safety Standards. The intention with the bullet mentioning waste was to cover management of materials, which will be reused, and management of both radioactive and non-radioactive waste

			ration). ”					
2	30	4.28	“At the completion of decommissioning, the final decommissioning report is prepared, which should documents the end state of the decommissioning of the nuclear installation, and should provides reference to ... effluent and environmental monitoring, personnel monitoring, and types and volumes of wastes generated, as well as the waste destination. More details on the final decommissioning report are provided in Chapter 9 of this Safety Guide. ”	A Safety Guide should rather provide recommendations and guidance (i.e. “should” statements) than only describe good practices. As Paras 9.1 to 9.4 provide further guidance on the final decommissioning report, reference to Chapter 9 should be included here for the sake of completeness.	X			
2	31	4.29	1 st sentence: “Security and safeguard concerns will be reduced as decommissioning occurs since nuclear and radioactive material is being removed from the installation.”	Amendment for completion. Nuclear material includes e.g. spent fuel generated from the operation of nuclear reactors.	X			
1	32	5.2	“Two decommissioning strategies have been defined by the IAEA: immediate dismantling and deferred dismantling. These strategies are defined in the General Safety Requirements GSR Part 6 [1]. The “No action” strategy (also denoted as “entombment”, in which all or part of the installation is encased in a structurally long lived material) should not be regarded as an acceptable decommissioning strategy and is not an option in the case of planned permanent shutdown. ”	2 nd sentence: In order to be more specific, the relevant publication should be designated here. 3 rd sentence: It is not clear what the term ‘no action strategy’ stands for in this context since it is not introduced in GSR Part 6. If the term is used here as a synonym for ‘entombment’, the sentence should be rephrased accordingly (compare with Para 1.10 of GSR Part 6).		X		Explanation added for “no action” strategy/approach. It is not the same as entombment (discussed in 5.19-5.20), as entombment requires quite a lot of actions to be implemented.
3	33	5.4	Last sentence: “In this context, release from regulatory control without restrictions should be the	Wording.	X			

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			preferred end state and ultimate objective of decommissioning.”					
3	34	5.6	“Based on the selected strategy, the final decommissioning plan should describe the timing and sequencing of decommissioning actions, ...”	Wording.	X			
2	35	5.7	Last sentence: “Decommissioning should commence is expected to commence after the transition period and to should continue in phases or as a single project until an approved decommissioning end state is reached.”	Present wording could raise the question who is expecting. Adapt wording to be in line with the remaining document.	X			
2	36	5.8	Last bullet: “Availability of infrastructure for radioactive waste management, including existing or anticipated disposal options .”	Clarification regarding the final step of radioactive waste management. Ensuring consistency with Para 5.42 (f).	X			
3	37	5.9	“More detailed considerations related to the above-mentioned factors are provided later in this section.”	The text in Para 5.9 is the direct continuation of text in Para 5.8. Please move this sentence to the end of Para 5.8.	X			
2	38	5.13	5 th bullet: “Establishing common facilities providing support for the predisposal management of radioactive waste (i.e processing, treatment, storage and removal from the site) and coordinating their use for different decommissioning projects on the site;”	According to the IAEA Safety Glossary (2007 Edition), the term ‘processing’ is more comprehensive and includes ‘pretreatment’, ‘treatment’ and ‘conditioning’. Predisposal management of radioactive waste, as the term is used in GSR Part 5, covers all the steps in the management of radioactive waste from its generation up to (but not including) disposal, including process-	X			

				ing, storage and transport.				
1	39	5.15	<p>“Unforeseen permanent shutdown could occur during operation of a nuclear installation based on economical, technical or sometimes political reasons. In such cases, the decision to permanently shut down an installation cannot be anticipated by the licensee, and a revision Consequently, a review of the preferred decommissioning strategy may be necessary on the basis of the situation that initiated the sudden shutdown, in order to evaluate whether a revision of the strategy is required.”</p>	<p>Ensuring consistency with Para 5.4 of GSR Part 6 which states: “If shutdown of a facility is sudden, the decommissioning strategy shall be reviewed on the basis of the situation that initiated the sudden shutdown, to determine whether revision of the strategy is required.”</p> <p>Unforeseen permanent shutdown may require a review of the preferred decommissioning strategy. Such an expert review, however, does not necessarily lead to a revision of the decommissioning strategy. We assume that the review is conducted in such a way that it does not anticipate the outcomes. Furthermore, the adopted national policy on decommissioning might exclude certain decommissioning strategies for political or other non-technical reasons (see Para 5.21).</p>	X			
3	40	5.16	<p>“A premature permanent shutdown of a nuclear installation may also be result of an accident. In this case, the first objective is to bring the installation into a safe condition state, before reviewing the de-</p>	<p>Modify wording to be consistent with Para 5.17 which uses the term ‘safe state’.</p>	X			

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			commissioning strategy. ...”					
3	41	5.18	1 st sentence: “Incidents or Accidents situations may lead to a spread of contamination outside of the buildings of the nuclear installation, implying the need to implement remediation actions on the site where the installation is located.”	Ensuring consistency with Para 2.6.	X			
3	42	5.19	1 st sentence: “Entombment, in which all or part of the nuclear installation is encased in a structurally long lived material, is not an acceptable strategy for planned decommissioning.”	Wording.	X			
3	43	5.22	“There may be different considerations related to the selection of a decommissioning strategy for the a nuclear installations, based on its type, size and complexity, ...”	Editorial.	X			
2	44	5.24	1 st sentence: “The decommissioning strategy for a particular installation should also take into account the characteristics of the site where the installation is located.”	A Safety Guide should rather provide recommendations and guidance (i.e. “should” statements) than only describe good practices.	X			
3	45	5.27	1 st sentence: “When selecting a decommissioning strategy where more than one nuclear installation is located on a site, ...”	Wording.	X			
2	46	5.29	Last sentence: “Taking into account only this aspect, a the preferred decommissioning strategy will be immediate dismantling.”	Clarification with the intent to be more restrictive here. Present wording suggests that there is at least one alternative option available which can be considered equivalent with respect to the desired end state. How-	X			

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				ever, this is not the case.				
3	47	5.35	1 st sentence: “When selecting a decommissioning strategy, the licensee should consider the results of the periodic safety reviews performed during the operation of the nuclear installation.”	In nuclear installations, periodic safety reviews are typically carried out every ten years. There is usually more than one periodic safety review during the operational lifetime (depending on its duration) of an individual installation.	X			
2	48	5.42 (c)	“Waste processing treatment facilities or infrastructure for all types of radioactive waste;”	According to the IAEA Safety Glossary (2007 Edition), the term ‘processing’ is more comprehensive and includes ‘pretreatment’, ‘treatment’ and ‘conditioning’.	X			
3	49	5.42 (f)	“Availability of final disposal capacity.”	Consistency with the terminology used in the IAEA Safety Glossary (2007 Edition). The word ‘final’ should be deleted because a contrast between interim disposal and final disposal does not exist.	X			
2	50	5.43	1 st and 2 nd sentence: “In the absence of facilities and infrastructure for processing treatment of radioactive waste, or when the storage or disposal capacities are not available, the preferred decommissioning strategy is likely to be deferred dismantling. If on-site or external waste processing treatment and storage facilities are available, then ...”	According to the IAEA Safety Glossary (2007 Edition), the term ‘processing’ is more comprehensive and includes ‘pretreatment’, ‘treatment’ and ‘conditioning’.	X			
2	51	6.2 (d)	“Actions after termination of the decommissioning license, e.g. ... ongoing man-	According to the IAEA Safety Glossary (2007 Edi-	X			

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			agement <u>handling and processing</u> of waste after completion of decommissioning, temporary storage of waste and its final <u>subsequent</u> disposal.”	tion), the term ‘radioactive waste management’ covers all administrative and operational activities involved in the handling, pretreatment, treatment, conditioning, transport, storage and disposal of radioactive waste. The word ‘final’ should be deleted because a contrast between interim disposal and final disposal does not exist.				
1	52	6.4	“It is important for the decommissioning cost estimate to distinguish between operating expenses and decommissioning expenses.”	It is not clear what is meant with ‘operation’ in this context. We think the residual operation during dismantling is meant here. If so, the fraction of money needed for decommissioning and for residual operation, respectively, do not play a big role. The total costs need to be covered by the operator’s provisions.			X	It is essential to make clear distinction between actions for which decommissioning fund can be used and the actions which are paid from other funds, especially during transition.
3	53	6.7	1 st sentence: “Responsibility for preparing the cost estimate and its updates resides with the licensee, but the work may be done by a contractor.”	Editorial.	X			
3	54	7.1	“Decommissioning planning throughout the lifecycle of a nuclear installation is important to facilitate conduct of decommissioning, <u>to</u> minimize exposures to decommissioning workers, <u>the public and the environment</u> , to minimize radioactive	Please add the phrase ‘the public and the environment’ to get the full scope of decommissioning planning.	X			

			waste generation, and to estimate the decommissioning costs.”					
2	55	7.6 (b)	“Facilitate access to process equipment , structures, systems and large components, including compartmentalization of processes ...;”	Does process equipment not fall under the term ‘systems’ ? Why is access to large components of concern only ? That seems to be too restrictive.	X			
3	56	7.6 (h)	“... and utilize processes for minimizing and/or reducing the volumes of waste;”	Usage of processes for minimizing and reducing waste volumes in parallel may result in a conflict of objectives as minimization goes beyond reduction.	X			
2	57	7.11 (e)	“Availability of a radioactive waste disposal capacity and waste acceptance requirements or criteria for waste disposal;”	Given that disposal is the final step in the management of radioactive waste, the waste packages must comply with the waste acceptance requirements of the disposal facility. Waste acceptance requirements result in particular from the safety case and are to be authorized by the competent regulatory body. If a selected or anticipated disposal option is available, but the performance of the safety case is still missing or pending and, thus, waste acceptance requirements are not available or not finalized, the term ‘waste acceptance criteria’ should be used.	X			
2	58	7.14	3 rd sentence:	For completion.	X			

			“Records from all the phases of the nuclear installations’ lifecycle, including siting, design, construction, commissioning , operation and decommissioning, which are of importance for decommissioning planning and conduct, should be identified, preserved and made available when needed ...”	Records made during commissioning should include records of equipment and system tests, test procedures and test results (see Para 4.19 of the Safety Guide GS-G-1.4 “Documentation for Use in Regulating Nuclear Facilities”).				
3	59	7.14 (a)	3 rd bullet: “Criticality safety records [36] ; Add Ref. [36] to the list of references: “ INTERNATIONAL ATOMIC ENERGY AGENCY, Criticality Safety in the Handling of Fissile Material, IAEA Safety Standards Series No. SSG-27, IAEA, Vienna, 2014. ”	Please include a reference [36] to the IAEA Safety Guide “Criticality Safety in the Handling of Fissile Material” which provides further guidance.	X			
2	60	7.24	Last sentence: “Notwithstanding this, an emergency plan and a security report are is usually requested as a separate documents even for simple projects.”	Amendment for completion.	X			
2	61	7.29	1 st sentence: “Radiological characterization data should include zone site area description (e.g., premises of the nuclear installation, environment ground and surface water, soil, and sediments), ...”	Consistency with the terminology used in the IAEA Safety Glossary (2007 Edition).	X			
2	62	7.32	“As an example, a decommissioning project based on an immediate dismantling strategy could consist of the following phases: ...”	For completion and clear distinction from the multi-phase approach which is adopted for deferred dismantling (see Para 7.41).	X			
3	63	7.38	2 nd sentence: “Large and complex decommissioning projects will require radioactive waste	Consistency with the terminology used in the IAEA Safety Glossary (2007 Edi-	X			

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			management facilities for processing, interim storage and transport of decommissioning waste.”	tion). Storage is by definition an interim measure.				
2	64	7.39	1 st sentence: “While the bulk of the <u>radioactive</u> waste from nuclear power plants will be low level radioactive waste, a small percentage will be intermediate level waste with very high contact dose rate, requiring shielded packages for safe storage.”	The current wording of the first clause is misleading. Indeed, the bulk of waste from the decommissioning and dismantling of a nuclear power plant will be conventional (non-radioactive) waste.	X			
3	65	7.41	“A deferred dismantling decommissioning project <u>based on a deferred dismantling strategy</u> could be considered a multi-phase project, consisting of the following phases: ...”	Wording.	X			
2	66	7.44	1 st sentence: “A surveillance and maintenance plan for the safe enclosure period is <u>should be</u> based on the outcomes of the safety assessment.”	A Safety Guide should rather provide recommendations and guidance (i.e. “should” statements) than only describe good practices.	X			
1	67	7.44	Please add new last sentence: “... typical issues to be considered carefully. <u>The licensee should perform at regular intervals a review of the safety of the nuclear installation as a whole during the safe enclosure period to demonstrate the compliance with its expected condition.</u> ”	Please add the concept of a periodic safety review for deferral.	X			
3	68	7.56	2 nd sentence: “Technical challenges are expected to be possible <u>possibly</u> larger, ...”	Grammar.	X			
2	69	8.5	Please add a new bullet: “ <u>Drainage of pipes and reduction of fire loads;</u> ”	These are further modifications that should be performed if the licensee adopts a deferred dismant-		X		We are not sure that drainage of pipes or removal of combustible materials are facility modifica-

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				ling strategy.				tions; these are more actions which are done during transition. Your idea has been captured in 7.19.
3	70	8.9	3 rd bullet: “Availability of suitable waste containers, routes and facilities for storage and disposal disposition facilities ;”	Wording.	X			
2	71	8.9	Penultimate bullet: “Time and schedule constraints, such as availability of waste processing treatment facilities; and ...”	According to the IAEA Safety Glossary (2007 Edition), the term ‘processing’ is more comprehensive and includes ‘pretreatment’, ‘treatment’ and ‘conditioning’.	X			
2	72	8.9	Please add a new bullet: “ Generation of secondary radioactive waste ;”	The generation of secondary radioactive waste is another factor which may influence the selection of decommissioning techniques to be applied.	X			
3	73	8.13	3 rd sentence: “An example of this is during size reduction of redundant ventilation ducting using a diamond wire system, sharp edges are generated and a number of additional control measure should be adopted, such as application of protection covers.”	Unnecessary detail in the context of this sentence. It can be deleted without any loss of information.	X			
3	74	8.15	1 st sentence: “The development and update of the list of SSCs important to safety is based on the design of the existing nuclear installation, the installation of the infrastructure to enable decommissioning and the safety assessment concerning the decommissioning actions.”	Wording.	X			

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3	75	8.19	<p>1st sentence: “During decommissioning, radioactive and non-radioactive effluents will be generated.”</p> <p>3rd sentence: “In general, the expected discharges of effluents should be less than during operation of the <u>nuclear</u> installation but may be in a different form and with a different radionuclide composition.”</p> <p>4th sentence: “It is typical for effluent discharges to vary <u>th</u>rough the different phases of decommissioning.”</p>	<p>Editorial.</p> <p>Wording.</p> <p>Editorial (missing letter).</p>	<p>X</p> <p>X</p> <p>X</p>			
3	76	8.21	<p>1st sentence: “Depending on the <u>decommissioning</u> final end state <u>of the decommissioning project</u>, demolition of the remaining structures of the former nuclear installation may be required.”</p>	<p>Wording.</p>	<p>X</p>			
3	77	8.29	<p>Last sentence: “The waste management plan should define the manner in which material <u>and radioactive waste</u> will be removed from the nuclear installation and the manner for segregating radiological from non-radiological and hazardous waste.”</p>	<p>Wording.</p>	<p>X</p>			
3	78	8.30	<p>1st and 2nd sentence: “If existing waste processing systems cannot cope with the waste generated during decommissioning in the volumes expected, the construction of new facilities or the use of existing facilities for <u>interim</u> storage should be considered. Consideration should also be given to</p>	<p>Consistency with the terminology used in the IAEA Safety Glossary (2007 Edition). Storage is by definition an interim measure.</p>	<p>X</p>			

			minimizing cross-contamination of waste and materials, and the generation of secondary waste, which may require additional interim storage or processing capacities on-site.”					
2	79	8.33	Please add new last sentence: “... identification of the waste origin. A proper determination and documentation of the characteristics of waste form, waste container and/or waste package should be ensured to provide data required for future decisions, e.g. disposal. ”	Clarification. According to the IAEA Safety Glossary (2007 Edition), the term ‘waste form’ means waste in its physical and chemical form after treatment and/or conditioning, resulting in a solid product prior to packaging. Waste form and waste container constitute the waste package.	X			
1	80	after 8.33	Please include new paragraph with the following text: “ Decisions on the processing of radioactive waste generated during decommissioning should consider existing or anticipated options for waste disposal. ”	Given that disposal is the final step in the management of radioactive waste, the waste packages must fulfill the waste acceptance requirements (in case of an existing disposal option) or waste acceptance criteria (in case of an anticipated disposal option).	X			
1	81	8.35	“The licensee should maintain waste management related records using a specific database of the ensure that each waste and packages generated during decommissioning is provided with a durable label carrying an identification number and relevant information, and that proper records of each waste package and all the unpackaged waste are kept as part of the integrated management system. All	This is a more specific proposal for meeting the requirements established in Para 8.9 of GSR Part 6: “The licensee shall ensure traceability for all waste generated during decommissioning. The licensee shall maintain up to date records of the waste gener-	X			

			<p>records should be securely stored, easily accessible and be able to be retrieved over an extended period of time after completion of decommissioning using a specific database. The data recorded for each individual waste package should include as a minimum:</p> <ul style="list-style-type: none"> • Origin of waste; • Identification number of the package; • Type of waste packages; • Volume or weight of the package; • Radioactive inventory (total activity, nuclide composition or spectrum and activities of main radionuclides); • Results of surface contamination measurement; • Maximum Contact dose rate at contact and 1 m distance (transport index) and date of measurement; and • Corresponding classification of the radioactive waste [33].” 	<p>ated, stored in the facility, or transferred to another authorized facility, specifying its quantities, characteristics, treatment methods and destination.”</p> <p>Note to the penultimate bullet: The transport index is a measure for the radiation level (dose rate in units of mSv/h) at a distance of 1 m from the surface of a package (see Paras 5.23 to 5.24 in the Safety Requirements SSR-6 “Regulations for the Safe Transport of Radioactive Material, 2012 Edition”).</p>				
1	82	9.3	<p>2nd sentence: “Additionally, the licensee may prepare more specific documentation of the decommissioning project for its own use, e.g. providing details about methods and tools applied for conducting decommissioning actions ...”</p>	<p>Experience feedback from a decommissioning project should not be kept internally.</p>	X			
3	83	9.18	<p>1st sentence: “If the decommissioning waste has to be stored on-site for a longer period of time after completion of decommissioning, an application for ereation construction of a new storage facility for radioactive waste must be prepared by the licensee.”</p>	<p>Wording.</p>	X			

			Penultimate sentence: “Moreover, information such as radiological surveys, effluent and environmental monitoring, and personnel exposure monitoring <u>occupational exposure</u> data should be reported to the regulatory body, as required.”	Consistency with the terminology used in the IAEA Safety Glossary (2007 Edition).	X			
3	84	Ref. [33]	“... Classification of <u>Radioactive</u> Waste, IAEA Safety Standards Series No. GSG-1, IAEA, Vienna (2009).”	Citation of the correct title of GSG-1.	X			
3	85	Annex I	“... 2.3. Installation’s operational history, including modifications and events 2.4. Installation’s radiological characterization, including surface and subsurface soils and water ...”	Editorial.	X			
3	86	Annex III	“2.b. Identification of all <u>site</u> areas, <u>structures</u> , systems and components that can be released for unrestricted use”	For completion and consistency with the terminology used in the IAEA Safety Glossary (2007 Edition).	X			
3	87	Annex V V-7	1 st sentence: “The likelihood of bounding external events should be assessed, taking into account the decommissioning strategy and the site characteristics (e.g., seismic risks <u>hazards</u> , flooding, extreme temperatures, influence from or dependence on any neighbouring facilities).”	Use of correct terminology. See definition of the term ‘risk’ in the IAEA Safety Glossary (2007 Edition). Further guidance is provided in the Safety Guide SSG-9 “Seismic Hazards in Site Evaluation for Nuclear Installations”.	X			
3	88	Annex V V-22	1 st sentence: “Work performed during the transition period are <u>is</u> often done under the operational license and in accordance with ...”	Editorial.	X			
2	89	Annex V V-26	“Radiolysis, if not adequately controlled, may result in the release of hydrogen with the risk of explosion. Radiolysis <u>should</u>	In a Safety Guide, usually recommendations (or “should” statements) are	X			

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

			<p>shall be taken into account as appropriate in planning for decommissioning actions and assessing safety. ...”</p>	<p>provided. If, for whatever reasons, “shall” is intended to remain unchanged, the “should” statements in Para V-24 (criticality risk) and Para V-25 (heat generation) need to be converted into “shall” statements as well (consistency with the Safety Requirements NS-R-5 (Rev. 1) “Safety of Nuclear Fuel Cycle Facilities”). See also the statement in Para V-15 which states “During decommissioning, safety issues such as ... have to be considered in the safety assessment.”</p>				
3	90	General	<p>Please check spelling in the whole document:</p> <ul style="list-style-type: none"> • ‘aging’ vs. ‘ageing’, • ‘end state’ vs. ‘end-state’, • ‘program’ vs. ‘programme’, • ‘socioeconomic’ vs. ‘socio-economic’, • ‘subcontractor’ vs. ‘sub-contractor’. 	<p>Harmonization of spelling and consistent usage of either American English or British English throughout the document are recommended.</p>	X			

Reviewing of DS452 Safety Guide “Decommissioning of Nuclear Installations”

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Nándor Ötvös		Page.... of....					
Country/Organization: Hungarian Atomic Energy authority		Date: 28. Oct. 2014.					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	ANNEX I/ REFERENC ES TO ANNEX I (page 69)	[2] SRS 45 for the content of the FDP	There is only one document listed in the reference list, which is specific for only one topic. It is proposed to make reference also to SRS 45 which deals with the content of the FDP.	X			
2.	8.35, 3rd line, (page 55)	„The data recorded should include as a minimum: ... radioactive inventory,contact dose rate, coresponding classification of the radioactive waste” Time of the inventory for all measured and calculated data	The inventory or the dose measurements or activity measurements or calculation of these can only be used if time of validity is included.	X			

Decommissioning of Nuclear Installations (DS452)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 1 of 5 Country/Organization: Japan/ Nuclear Regulation Authority (NRA) Date: 27. Oct. 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	Make use of "facility" and "installation" clear.	Similar terms "facility" and "installations" are used together in this document. Although regarding the definition of "facility", footnote1 refers to "the surface and subsurface soil, and any surface or subsurface water or aquifers", these contents are included in the definition of "land" in GSR Part6 (para.1.3). For clarification, more description based on GSR part6 is useful to understand the intent of the terminology. Although examples of "installations" are shown in para.1.14, some descriptions of the definition of "installations" would be useful.	X			The terms facility and nuclear installation are defined in the Safety Glossary. When we address a nuclear installation which is to be decommissioned, we try to consistently use the term "nuclear installation". We use the term facility in more general context (for example "multi-facility site", "other facilities on site"), in the context of supporting facilities ("waste management facility"), or when we paraphrase the requirements.

2	1.4/5	<p>Modify following text. “...the time period for decommissioning actions may typically range from a few months, for simple and small facilities, to decades (for example, to allow for radioactive decay), and may include phased release of parts of the facility from regulatory control.”</p>	<p>Clarification This text is confusing. What is the subject of “include”?</p>	X			
3	1.14/7	<p>...and non-reactor research facilities. <u>Decommissioning of these facilities is addressed in other Safety Guides respectively [3, 14].</u></p>	<p>Clarification. It is useful by adding the proposing text.</p>			X	<p>Already stated in para 1.9. which introduces ref [3].</p>

Decommissioning of Nuclear Installations (DS452)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 2 of 5 Country/Organization: Japan/ Nuclear Regulation Authority (NRA) Date: 27. Oct. 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
4	1.17/4	What does “significant abnormal event” mean? Current Safety Guide WS-G-2.1 referred to an “abnormal event.”	Confirmation Clarification	X			The part of the sentence mentioning “significant abnormal event” has been deleted, please see the revised text
5	1.24	Section Chapter 2 addresses... Section Chapter 3 describesin Section Chapter 4, while Section Chapter 5... Section Chapter 6 addresses... is discussed in Section Chapter 7. Section Chapter 8 describes... Section Chapter 9 discusses ...	Editorial	X			
6	Requirements	Requirements X <u>of GSR Part6 [1]</u> :	Format, consistency with other Safety Guides.	X			
7	Requirement 1	Optimization of protection and safety <u>in decommissioning</u>	Consistency with GSR Part6.	X			
8	2.6/4 (p.8)	...as they are well addressed in other IAEA safety standards [4, <u>19</u> , 22].	WS-G-3.1 is also a relevant document.	X			
9	2.7/1	<u>Remedial Remediation</u> actions for the immediate area...	Wording. Consistency with GSR Part3.	X			
10	2.8/4	Add a footnote on environmental impact assessment such as footnote 4 in SSG-29 (p.87).	Clarification	X			
11	Requirement 2	Graded approach <u>in decommissioning</u>	Consistency with GSR Part6.	X			
12	Requirement 3	Assessment of safety <u>for decommissioning</u>	Consistency with GSR Part6.	X			
13	Requirement 4	Responsibilities of the government <u>for decommissioning</u>	Consistency with GSR Part6.	X			

Decommissioning of Nuclear Installations (DS452)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 3 of 5 Country/Organization: Japan/ Nuclear Regulation Authority (NRA) Date: 27. Oct. 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
14	Requirement 5	Responsibilities of the regulatory body <u>for decommissioning</u>	Consistency with GSR Part6.	X			
15	3.17/1	...addressing radiological health and safety, and protection of the environment...	Editorial	X			
16	Requirement 6	Responsibilities of the licensee <u>for decommissioning</u>	Consistency with GSR Part6.	X			
17	3.21/6	It has been demonstrated that an early <u>cooperation</u> co-operation between the regulatory body and the licensee...	Editorial	X			
18	3.24	Change “ 3.24 ” into “3.24”.	Editorial (The font is boldfaced type.)	X			
19	4.25/3	Add description of decommissioning limits specifically.	Clarification It may be to make difference between “limits” and “conditions” clear.	X			Decommissioning limits and conditions are OLCs for decommissioning. Please see the definition in the Safety Glossary.
20	4.26	Should the licensee change <u>during the lifetime of the facility</u> after permanent shutdown or during decommissioning , procedures must be in place to ensure the transfer of responsibilities is controlled and understood, ...	Consistency with GSR Part6. This paragraph is deemed to refer to paragraph 4.7 of GSR Part6. Although para.4.7 refers to “the licensee changes <u>during the lifetime of the facility</u> ”, this paragraph refers to “the licensee change <u>after permanent shutdown or during decommissioning</u> ”.			X	Your comment is correct, however, in this paragraph we wanted to address changes which happen after cessation of operation. You will see that in the second sentence

							of this paragraph we speak about situations when there is an active decommissioning project.
21	5.18/6	Off-site contamination, as consequence of an accident, is out of the scope of this Safety Guide <u>but it is addressed in Safety Guide [19]</u> .	WS-G-3.1 is a relevant Safety Guide.	X			
22	Requirement 10	Planning for decommissioning	Consistency with GSR Part6.	X			
23	7.16	Moved after Requirement 12.	This paragraph is to relate to Requirement 12 : Conduct of decommissioning actions.	X			

Decommissioning of Nuclear Installations (DS452)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 4 of 5 Country/Organization: Japan/ Nuclear Regulation Authority (NRA) Date: 27. Oct. 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
24	7.17 7.18	Moved after Requirement 15.	This paragraph is to relate to Requirement 15 : Completion of decommissioning actions and termination of the authorization for decommissioning.	X			Paragraph moved to 9.16.
25	7.19	Moved after Requirement 14.	This paragraph is to relate to Requirement 14 : Radioactive waste management of decommissioning.			X	This paragraph addresses RWM during operation as a precondition for transitioning to decommissioning, so it does not deal with management of decommissioning waste.
26	7.23/2	Before the permanent shutdown of a nuclear installation the licensee must inform the regulatory body <u>(or the government, if so required)</u> about its plans to cease the operations.	Consistent with para.3.4 of GSR part6.	X			
27	7.26/4	The purpose of this independent peer review is to provide confidence to <u>interested parties</u> all stakeholders that...	Editorial	X			
28	7.35/2	..., subject to additional appropriate safety <u>measure justification</u> .	The meaning of “safety justification” cannot be understood.		X		Although “safety justification” is quite common term used

							internationally and in some IAEA Safety Standards, an alternative formulation has been proposed.
29	7.38/1	<u>Depending on availability of disposal capacity</u> If disposal capacity is available, ...	Whether disposal capacity is available or not, decommissioning waste should be disposed of in the appropriate waste disposal facilities	X			

Decommissioning of Nuclear Installations (DS452)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 5 of 5 Country/Organization: Japan/ Nuclear Regulation Authority (NRA) Date: 27. Oct. 2014							
30	7.56/6	Nevertheless, decommissioning of such installation should be planned and considered as an authorized activity which should, <u>in principle</u> , comply with the same set of safety criteria as decommissioning after normal operation and planned shutdown. <u>In case of severe accident, the decommissioning plan of such installation should be consistent and coordinated with overall strategy including off-site remediation.</u>	In principle the intent of this text is true. However there might be cases which the safety criteria for after normal operation and planned shutdown are not complied with. The final decommissioning plan of the accident damaged nuclear installation should be developed in due consideration with the off-site remediation plan that is out of the scope of this Safety Guide. In such a case, a harmonized strategy and plan should be pursued at the level beyond the scope of this Safety Guide.	X			
31	Requirement 13	Emergency <u>response</u> arrangements for decommissioning	Consistency with GSR Part6.	X			
32	8.26/4	Replace this example with other more appropriate example such as loss of containment.	An example of this could be the recovery from a dropped waste package either within the nuclear installation or on transfer to the interim storage facility or disposal site.		X		Example added, the old example kept.
33	Requirement 14	Radioactive waste management <u>in</u> for decommissioning	Consistency with GSR Part6.	X			
34	8.35/9	Change “Contact dose rate” into “Surface radiation level” or “Surface dose rate”	More appropriate term		X		Please see the modified text which accommodates a comment from Germany.
35	9.21/7	..., if the licensee’s plans for the entire site are to re-use it as according to the residential-farmer scenario (“greenfield”) after completion of decommissioning on the entire	Clarification	X			

		site.					
36	CONTRIBUTORS TO DRAFTING AND REVIEW	This page should be moved to the end of the document.	Editorial	X			

NSGC comments on DS452 Decommissioning of Nuclear Installations

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: G. DANDRIEUX Country/Organization: FRANCE-MEDDE Date: 2014-10-15							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Annex I Chapter 12	12. PHYSICAL SECURITY AND- SAFEGUARDS 12.1. Legal and regulatory framework 12.2. Organization and responsibilities 12.3. Physical security programme and measures 12.4. Safeguards programme and measures	Decommissioning case does not deal with nuclear security			X	Annex I provides an example of the possible content of a final decommissioning plan for a nuclear installation. As stated in paragraphs 1.23 and 4.29 (DS452 version November 2014), security and safeguards aspects are important during decommissioning and have to be addressed. Security and safeguards related arrangements should take into account decommissioning actions, so should be aligned with the decommissioning plan and with the changes of the installation layout during decommissioning. The opposite is valid too; decommissioning should be organized and performed in a way which does not compromise the security of the nuclear installation and provides opportunity for safeguards related activities. That is why security and safeguards plans/programmes are considered supporting documents to the final decommissioning plan. For large installations they are usually separate documents, but should be summarized or referenced in the final decommissioning plan (for example in the Chapter 12. PHYSICAL SECURITY AND SAFEGUARDS).

TITLE
Decommissioning of Nuclear Installations
Draft Safety Guide
DS452 (Revision of Safety Guides WS-G-2.1 and 2.4)
Status: STEP 7
September 2014

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: A. Sobolev, A. Schadilov, M. Nepeypivo Page.... of.... Country/Organization: Russian Federation Date:16/10/2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	1.3	These actions are carried out to achieve a <i>progressive and-systematic reduction</i> in radiological hazards during decommissioning	During decommissioning due to the disturbance and removing of safety barriers for specific period radiological hazards could be even increased.			X	Hazards (source term) are systematically reduced, but the risks (potential of exposure) could increase during some activities
2.	1.4	On completion of decommissioning and on reaching the planned end state, the authorization for decommissioning can be terminated and the sites and remaining structures of the former facilities, if any, will be available for unrestricted or restricted <i>use</i>	According to the terminology of GSR Part 6 “Decommissioning of Facilities”			X	We think “re-use” is also a proper term, which emphasizes the fact that the site is used for a new purpose, which is different than the original use during operation.
3.	1.15.	Decommissioning considerations and actions addressed in this Safety Guide take place from <i>siting and</i> design of an installation until termination of license for decommissioning.	Decommissioning considerations should be taken into account from siting stage (according to GSR Part 6, para.1.15).	X			
4.	1.16 and then over all text (e.x. paras 2.8, 2.11, 3.13, etc)	...This general approach is adapted to the specific installation’s situation by the application of a graded approach, which may impact the selection of the decommissioning strategy, planning details, conduct of decommissioning actions and <i>final-end state</i> .	According to the terminology of GSR Part 6	X			

5.	2.11.	It is reasonable to use term “facility” instead of “installation” during this para and then as in the Requirement 2.				X	This guide is addressing decommissioning of installations, so we prefer keeping that word in the bullet list. The term “facility” is used when the general requirements are quoted or paraphrased to make an introduction to the guidance part of the text.
6.	2.11. last bullet	(e.g., unrestricted or restricted use, <i>total removal or reuse</i>)	It should be clarified whether this list is applied to the facility as a whole or to its different parts or SSCs and then correspondingly modified.	X			Clarification provided, see the revised text
7.	3.11	The regulatory body should develop a process for consideration of the license application for decommissioning, including the regulatory review process. This process should provide the identification of milestones, decision points and the period of time for the regulatory review. The process could include performing an acceptance review, performing review of the final decommissioning <i>plans</i> and its supporting documents in accordance with national requirements.	The regulatory body should review not only final decommissioning plan but all decommissioning plans including initial (according to GSR Part 6, para 3.3)			X	In this point we discuss license application for decommissioning, which involves the final decommissioning plan.
8.	3.21	The licensee should select a strategy that is consistent with national policies, prepare <i>and maintain the decommissioning plans (i.e. the initial decommissioning plan and the final decommissioning plan)</i>	According to GSR Part 6, para 3.43	X			
9.	5.8	Availability of <i>expertise</i> , technologies and <i>infrastructure</i> ;	The terms “expertise” and “infrastructure” should be clarified and supported by examples	X			
10.	5.8	Availability of <i>infrastructure</i> for radioactive waste management.	The term “infrastructure” should be clarified and supported by examples	X			

11.	5.8	to add as one of the main factors which influence the selection of the decommissioning strategy: <i>- social and economical factors</i>	Not only <i>socioeconomic impact</i> could drive the selection of the decommissioning strategy	X			
12.	5.19 ?	Entombment, in which all or part of the facility is encased in a structurally long lived material, is not <i>considered</i> a decommissioning strategy <i>and is not an option in the case of planned decommissioning. It may be considered a solution only under exceptional circumstances (e.g. following a severe accident) [1]</i>	See GSR Part 6, para 1.10			X	The intention is not to repeat the requirement, but to provide guidance or illustration or example, so the reader understands the requirement and the way to comply with it.

**Comments on the IAEA Draft document
Decommissioning of Nuclear Installations (DS 452, draft from 2014-01-09) (Draft September 2014)**

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Country/Organization: Ukraine/ State Scientific and Technical Centre for Nuclear and Radiation Safety Date: October 10, 2014							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification /rejection
1	Para 2.18, page 11	Add the following: There should be demonstrated that interaction of all planned decommissioning actions is ensured, and additional sources of hazard as a result of activities at adjacent objects/systems are absent.	In the course of decommissioning, several designs for reconstruction of facilities, buildings, systems and equipment could be implemented. Taking into account close interrelation of all components of the nuclear facility, implementation and results of these activities may have negative impact on safety of other components. For example, changes in water, power and heat supply must take into account consumption of facilities that are created or reconstructed.		X		Idea of the comment accepted, new paragraph 2.22 with slightly different wording introduced
2	Para 2.20, page 11	Add In case of significant duration of decommissioning process or its individual stages, periodical updating of safety assessment should be envisaged to take into account the results of activities performed.	For completeness			X	This point is addressed in the last sentence of 2.21.
3	Para 3.21,	Replacement.	Adjustment	X			

	page 15 first sentence.	"... the licensee should meet with the regulatory body to discuss the timing of decommissioning, expectations of the regulatory body, proposed decommissioning actions, and applicable regulations and guidance" is proposed to be replaced by "... the licensee should agree with the regulatory body: the timing of decommissioning, expectations of the regulatory body, proposed decommissioning actions, and applicable regulations and guidance" .					
4	Para 4.25, page 21, first sentence.	Replacement. "Daily briefings should be performed" to be replaced with "Briefings should be performed at the beginning of specific activities".	Daily briefings do not seem necessary if specific activities are carried out during several days/weeks as they may increase their duration		X		Please see the revised text which accommodates similar comment from ENISS.
5	Para 4.25, page 21, third sentence	Replacement. "Undertaking daily reviews of the actions" to be replaced with "Undertaking periodical reviews of the actions" ...	It seems expedient to draw up reviews to consider the results of activities completed.	X			
7	Para 7.6, page 39, bullet "k"	Replacement. Replace "radiological waste" by "radioactive waste"	Uniformity of terms	X			
8	Para 8.30, page 57	Add: At the end of the paragraph: "Such considerations should be taken in in the framework	It would be better to define more precisely when the decision about the necessity to construct new waste management facilities should be made.	X			

		of updating the initial decommissioning plan".	It should be taken into account that the construction itself takes certain time.				
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