

Draft Safety Requirements

DS452 Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities (28. August 2015)

ENISS Comments

COMMENTS BY REVIEWER							
Reviewer: ENISS				Pages 1 of 5			
Country/Organization: ENISS				Date: 28.09.2015			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	<p>We appreciate that nearly all of our former comments have been accepted. The draft is in a well established form now. There are only minor remarks, which could improve the document further.</p> <p>Our proposed changes are the following (marked in red).</p>		X			No action required.
2	5.6	<p>Any transition period between permanent shutdown and approval of the final decommissioning plan should be as short as possible such as 2 to 5 years,</p> <p>However, care should be taken to ensure that decommissioning funds are not used to perform Former operational tasks (such as removal of operational waste, removal of spent fuel, disposition of excess equipment) may now become part of decommissioning.</p>	<p>To define the period by numbers is inadequate. Already the decay time for irradiated fuel is about 5 years before it is reasonable to remove them from the reactor. There may have gone several years before the real decommissioning can start. This will depend from a number of circumstances.</p> <p>It is up to each country to decide how the funds are set up. There is no logical line between past-operation and decommissioning. In forming a decommissioning fund it has to be</p>		X		The idea accepted, please see the revised wording.

			determined which activities this fund will cover and which not.				
3	5.8	For newer facilities that have performed proper planning, a selection of a deferred dismantling strategy should not be solely the consequence of poor financial planning and lack of financial resources. As discussed in the Section 6 of this Safety Guide, the financial arrangements for decommissioning should be established early during the lifetime of the facility to enable safe decommissioning in a timely and efficient manner. When selecting a decommissioning strategy for older existing facilities, the lack of financial resources may be a real concern <u>if the economic situation has changed significantly due to manifold reasons including decisions on a high political level</u> or if proper financial planning was not performed. In this case deferred dismantling should be considered until funds can be accumulated or obtained.	The age of a facility is not the decisive factor in choosing the strategy. There may be unexpected changes in national policies as we have seen after FA which have a very important influence.	X			
4	5.9	When updating the decommissioning plan, the licensee should <u>check</u> ensure that the decommissioning strategy is still appropriate. <u>Relevant</u> 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	The licensee alone cannot ensure things. Only updates that involve significant changes should be considered.	X			

		radiological and physical status of the facility, 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.					
5	5.31	Additionally, safety systems may be required depending on the outcome of the safety assessment process and the use of best available techniques <u>not entailing excessive costs.</u>	Especially for decommissioning activities the cost factor is rather important and needs to be taken into account.	X			
6	5.40	The environment around the facility may have changed since the building was constructed. An example might be the change in the population distribution surrounding the facility such that an analysis involving an accident during the transportation of decommissioning waste would have to be reconsidered.	This paragraph should be deleted as neither a recommendation nor good practice is proposed. The example on transportation is completely inappropriate as transport is one of the safest operation in the nuclear field.		X		Your point accepted, but the paragraph kept in a revised form. Example changed on the basis of a comment from Japan.
7	6.9	The occurrence of a spill, leaks or accidents should also prompt the updating of the cost estimate.	Spills or leaks are not such important to require such a measure.		X		Please see the revised text, which accommodates comments from Germany and Japan.
8	6.14	If spent fuel or radioactive waste storage facilities remain on site after the end of decommissioning, they should be licensed as new operating facilities. The operational costs of such new facilities for waste or spent fuel management should not be covered by the decommissioning fund.	There may be a new license or it could be done under the existing license: the point is that there has to be a license. Waste and spent fuel management is an integral part of decommissioning and thus need to be taken into account when financial planning of decommissioning.			X	We speak about situation after the end of decommissioning, when the license for decommissioning is terminated. Costs of operation of new facilities which remain on site after the end of decommissioning

							can't be part of the decommissioning expenses.
9	7.4.	For many older existing facilities, decommissioning may not have been considered at the design stage or during construction and subsequent operation. For these facilities, planning for decommissioning should start as early as possible once the omission has been recognized, such as within 1 to 3 years.	Too sophisticated. The formulation "as early as possible" should be enough.	X			
10	7.41	A surveillance and maintenance plan for the safe enclosure period should be based on the outcomes of the safety assessment. It should consider ageing and obsolescence aspects of the SSCs. The safety assessment for the deferred dismantling strategy should be the basis 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 ageing and obsolescence of materials (spare parts) are typical issues to be considered carefully.	Sentence should be deleted to avoid repetition	X			
11	8.19	During decommissioning, radioactive and non-radioactive effluents will be generated. Discharge of radioactive effluents requires authorization from the regulatory body and control in compliance with appropriate national regulations. In general, the expected discharges of effluents should be less	The law/regulations will define the criteria for discharges. There is no relation to the former operational phase.	X			

		than during operation of the facility but may be in a different form and with a different radionuclide composition. It is typical for effluent discharges to vary through the different phases of decommissioning. For example, as decommissioning leads to a progressive removal of radiological hazards, radioactive discharges may reduce					
12	8.22	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 facility, their locations and distributions, and the volume of radioactive waste generated.	At the start of decommissioning, information can only be determined by conservative assumptions and therefore cannot be accurate and complete.	X			
13	Appendix, para 7	The likelihood and consequences of external events should be assessed, taking into account the decommissioning strategy and the site characteristics (e.g., seismic hazards, flooding, extreme temperatures, influence from or dependence on any neighbouring facilities, and aircraft crashes) and the likelihood and consequences of potential initiating events for incident/accident scenarios. (e.g., human error, fire, flood, dropped loads, building/structure collapse/failure, and the release of hazardous chemicals).	A protection against air craft crash for a decommissioning project is simply impossible and on the other hand unnecessary.	X			
14	Annex 3	1. Conduct of the final radiological survey and the survey results a. Summary of the survey, including changes from the final radiological sur-	There might be no baseline radiological site survey as referred to in 7.8			X	Para 7.8 explains how to deal with a situation when a baseline survey had not been

		vey plan and comparison with the initial (baseline) radiological survey <u>if available</u>					performed: “If a site did not have a pre-construction background survey performed, survey data from an undisturbed area with similar characteristics or a survey of similar building material should be used.” Anyway, the results of the final radiological survey should be compared with something that represents the “background” for that site.
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TITLE : DS452 Decommissioning of Nuclear Installations safety guide

COMMENTS BY REVIEWER				RESOLUTION			
Country/Organization: FRANCE		Date: 2015-10-2					
Pages							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1.6	1.6. Decommissioning of facilities is usually conducted as a project. A decommissioning project is a collaborative initiative, involving supporting analyses and studies, which is carefully planned to ensure safety of planned actions, and to achieve partial or complete removal of regulatory controls from a facility. A decommissioning project usually starts when preparation of the final decommissioning plan is initiated or, in some cases, when a decommissioning licence is granted.	End of the sentence should be deleted “when a ... “ Decommissioning actions cannot start if the decommissioning license has not been granted. A decommissioning project generally starts when a project manager is named, very often before the license is granted by the regulatory body. This situation is not linked to the availability of funds but may be linked to the need to perform cost estimates.			X	Decommissioning project is financed from the decommissioning fund. In some Member States the decommissioning funds can be used only once the license is granted.
2	2.17	The licensee should adequately control the work of any subcontractors involved in development of the safety assessment. The results of the safety assessment or part of the safety assessment, which may be developed by subcontractors, based on their relevant knowledge and experience in specific decommissioning techniques, should be reviewed, approved or accepted and implemented by the licensee, in accordance with the integrated management system. The results should also be reviewed and approved by the regulatory body, in accordance with the requirements of the national regulatory framework. to ensure overall safety during decommissioning.	The previous version should be kept to ensure that the regulatory review is done considering not only national requirements but also good practice to ensure safety during decommissioning. It seems obvious that the review should be performed in accordance with national requirements.	X			

3	5.24	<p>When selecting a decommissioning strategy where more than one facility is located on a site, it may be beneficial to define an overall site decommissioning strategy. This might include placing the facilities already permanently shut down into a safe enclosure status until the remaining facilities are permanently shut down. This may include managing priorities between facilities already permanently shutdown or to be permanently shutdown soon. Then the decommissioning of all facilities could be performed in a single campaign, avoiding any negative impact to the operating facilities and allowing better utilization of personnel.</p>	<p>Safe enclosure is not the better alternative. Managing priorities may be necessary to define an optimal order to perform decommissioning actions.</p>		X		Alternative wording proposed.
4	5.25	<p>There may be a request for the reuse of the part of the site or the entire site, or for reuse of existing building structures after completion of decommissioning. The timeframe for such a reuse of the site, either restricted or unrestricted, is an important consideration for the selection of a decommissioning strategy. If the site is needed for siting and construction of new facilities in the near future, such a request will lead to a preference for selection of the immediate dismantling strategy. may influence the choice of the dismantling strategy to reduce as much as possible the decommissioning planning and to start decommissioning actions as soon as possible after permanent shutdown.</p>	<p>Such a request (reuse) should not determinate the choice of the preferred decommissioning strategy. Moreover, in practice, the licensee often thinks to reuse but finally destroys the building structures Proposed new text. A modification of the paragraph is proposed to explain that such situation may accelerate the decommissioning planning..</p>		X		Unclear what is the meaning of “dismantling strategy” (not used in the Standards) and “to reduce as much as possible the decommissioning planning”. That is why we propose an alternative wording. But still, it is our understanding that in such case we speak about an immediate dismantling.

5	5.42	<p>If on-site or external waste processing and storage facilities are available, then either immediate dismantling or deferred dismantling is a viable decommissioning strategy. If the waste management infrastructure is available, including waste disposal capacities, then immediate dismantling would be the preferred strategy. In the absence of facilities and infrastructure for processing of radioactive waste, or when the storage or disposal capacities are not available, the preferred decommissioning strategy is likely to be deferred dismantling may include a waiting period until waste management infrastructures are available.</p>	<p>The absence of facilities and infrastructure for processing radioactive waste etc. should not be the only argument that determines the decommissioning strategy.</p>	X			
6	7.29	<p>When preparing the final decommissioning plans, experiences from ongoing or completed decommissioning projects of similar facilities should be utilized.</p>	<p>Experience feedback should be considered at any time of the development of decommissioning plans, not only for the final one.</p>	X			

**Draft Safety Guide DS452 “Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities”
(Version dated 28 August 2015)**

Status: STEP 11 – Second review of the draft safety standard by the SSCs

Note: [Blue parts](#) are those to be added in the text. [Red parts](#) are those to be deleted in the text.

COMMENTS BY REVIEWER					RESOLUTION			
Reviewer: Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) (with comments of GRS) Country/Organization: Germany					Page 1 of 8 Date: 2015-10-12			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3	1	1.1	1 st sentence: “With the maturing of the nuclear industry in the past decades, many Member States have constructed and commissioned facilities that use nuclear and radioactive material or radioactive sources in a variety of applications.”	Ensuring consistency with the definition of the related term in the IAEA Safety Glossary (2007 Edition).	X			
3	2	1.7	2 nd sentence: “With the increasing expansion of the nuclear industry worldwide and with many nuclear facilities nearing the end of their operating life times , experience has shown the importance of considering planning aspects of decommissioning for new facilities during their siting, design and construction.”	Wording. The phrase “increasing expansion” is a tautology. One could ask whether a decreasing expansion could also occur.	X			
2	3	1.17	2 nd sentence: “It is developed primarily for facilities with a normal operational history (i.e., without a severe accident), which was followed by a planned permanent shutdown.”	The term ‘permanent shutdown’, as used in this Safety Guide, means that the facility has ceased operations and operation will not be recommenced (see footnote No. 2 to Para 1.1).	X			

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

2	4	1.18	<p>3rd and 4th sentence: “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 licence for decommissioning or under a separate operating licence for processing or storage of operational waste and spent fuel. Other IAEA publications address these aspects [10–13, 39].”</p> <p>Please add the Safety Guide WS-G-6.1 to the list of references: “[39] INTERNATIONAL ATOMIC ENERGY AGENCY, Storage of Radioactive Waste, IAEA Safety Standards Series No. WS-G-6.1, IAEA, Vienna (2006).”</p>	<p>Amendment for the sake of completeness. Both the IAEA Safety Guides WS-G-2.5 [12] and WS-G-2.6 [13] are focused on processing (i.e. pretreatment, treatment and conditioning) of radioactive waste. Specific guidance on storage of radioactive waste is provided in the Safety Guide WS-G-6.1. A reference [39] to this publication should be added here.</p>	X			
3	5	1.21	<p>2nd sentence: “While this Safety Guide covers facilities associated with processing and storage of radioactive waste, it does not address disposal of radioactive waste and closure of waste repositories disposal facilities.”</p>	<p>Although defined in the IAEA Safety Glossary (2007 Edition), the term ‘repository’ is meanwhile considered as outdated and should be replaced by ‘disposal facility’. The Safety Requirements SSR-5 and all associated Safety Guides (GSG-1, SSG-14, SSG-23, SSG-29 and SSG-31) solely refer to disposal facilities.</p>	X			
2	6	2.8	<p>Last sentence: “Specific provisions required by the regulatory body based on the environmental impact assessment should be monitored overseen to ensure their implementation by the licensee, depending on the end state described in the final decom-</p>	<p>Clarification. It is more appropriate to say provisions required by the regulatory body should be overseen rather than they should be</p>	X			

			missioning plan.”	monitored to ensure their implementation by the licensee.				
2	7	2.15	“According to the complexity of decommissioning actions and the duration of the decommissioning project, the final decommissioning plan may be supported by a single overall safety assessment for the entire project, or by a summary summarized safety assessment, which covers the entire project and provides input and links to a set of more detailed safety assessments that may be developed separately for each decommissioning phase or work package, with due account taken of the interdependences between the different phases. ”	Clarification. If safety assessments are developed separately for each decommissioning phase, account should be taken of the interdependences among the different phases.	X			
2	8	4.14	Penultimate bullet: “ Predisposal W waste management (i.e. processing, packaging , storage and transportation; ete.);”	The predisposal management of radioactive waste covers processing (i.e. pretreatment, treatment and conditioning), storage and transport (see Para 1.2 of the Safety Requirements GSR Part 5). According to the IAEA Safety Glossary (2007 Edition), packaging is part of conditioning operations.	X			
2	9	5.9	2 nd sentence: “Updates of the final decommissioning plan ... during conduct of decommissioning should reflect the progress of the work, the continuous management and removal of the generated waste and the evolution of radiological and physical status of the facility.”	An update of the final decommissioning plan should reflect not only the continuous removal of the generated waste, but also the progress in its predisposal manage-	X			

				ment, taking into account the interdependencies among the various steps in the management of radioactive waste from its generation up to disposal (see Requirement 6 of GSR Part 5).				
2	10	6.9	2 nd sentence: “The occurrence of an incident (such as a spill, leaks or leakage) or accident should also prompt the updating of the cost estimate.”	More appropriate wording. The sentence mentions typical examples of incidents.		X		Please see the revised text, which accommodates comments from Japan and ENISS.
1	11	Section 7	It remains unclear for which reason the Paras 7.29 and 7.39 in the previous version of DS452 (dated 3 December 2014) have been deleted in the present version. According to the resolution table of Member States comments, there was no request from a State to do so. Both paragraphs illustrated exemplary how to manage a complex decommissioning project based on an immediate dismantling strategy (Para 7.29) or a deferred dismantling strategy (Para 7.39), respectively, by adopting a phased approach. Experiences in several Member States reveal that such a multi-phase approach is common practice. The corresponding guidance in former Paras 7.29 and 7.39 is considered useful especially for those States having to decommission a nuclear installation in the near future, without experience feedback being available nationally from the conduct of similar decommissioning projects in the past.	Justification for removal of both paragraphs from the Safety Guide is required.	X		These examples were deleted during the in-house review of the draft after addressing MS comments, on the basis of the recommendation from several decommissioning experts. These experts strongly disagreed with the “phased approach” and its inclusion in the Safety Standards, no matter it is a recognized practice in several Member States. Their concern was that the “phased approach” does not provide for a proper “up front” planning and cost estimate for the entire project, and that such approach leads to delays and cost overruns. In addition, they pointed out that the examples in 7.29 and 7.39 include activities which are typically not part of decommissioning (Phases 1 and 2 for 7.29, and Phase 1 for 7.30). The examples have been removed, as consensus was not achieved about their adequacy to be included in the Standards.	
3	12	7.6 (b)	“Facilitate access to structures, systems and components SSCs , including compartmentalization of processes (incorporate hatches, large	The abbreviation ‘SSCs’ has been introduced in Para 1.3.	X			

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

			doors);”					
3	13	7.6 (d)	“Use modular construction in order to facilitate the dismantling of structures, systems, equipment and components <u>SSCs</u> ;”	The abbreviation ‘SSCs’ has been introduced in Para 1.3.	X			
3	14	7.14 (a), last bullet	“Records of the history of the facility, including: ... • Waste storage <u>and/or</u> disposal locations.”	More general wording. Some decommissioning projects could require both waste storage and disposal locations.	X			
3	15	7.28	3 rd sentence: “Existing storage <u>areas for</u> of liquid radioactive waste are also of importance for decommissioning, as removal and processing <u>of this type of waste</u> may require considering also the physical and chemical status, as well as the design life of related storage tanks.”	To improve wording.	X			
2	16	7.33	1 st sentence: “In some decommissioning projects it may be advantageous to remove large components, e.g. steam generators from nuclear power plants, as a whole for storage and processing outside the facility’s building or to ship them to another facility away from the site for further segmentation, and treatment <u>and conditioning</u> .”	Amendment for the sake of completeness. Conditioning is a separate step in predisposal waste management. According to the IAEA Safety Glossary (2007 Edition), conditioning includes immobilization, packaging and, if necessary, provision of an overpack.	X			
3	17	8.2, last bullet	“Modifications of the existing infrastructure of the facility may be needed to facilitate immediate dismantling or, in some cases, to prepare the facility for a safe enclosure period. The main modifications may involve: ... • Establishment of an on-site interim waste storage area.”	Storage is, by definition, an interim measure, but it can last for several decades if a disposal option is not available. Consequently, the term ‘interim storage’ would be appropriate only to	X			

				refer to short term temporary storage when contrasting this with longer term storage. Storage as defined in the IAEA Safety Glossary (2007 Edition) should not be designated as interim storage.				
3	18	8.3	Last sentence: “This allows ... removal of the operational SSCs associated with the hazard (i.e., criticality monitoring <u>detection and alarm systems</u>) or minimizes the potential to cross contaminate redundant equipment.”	Consistency with the terminology used in the Safety Requirements NS-R-5 (Rev. 1) “Safety of Nuclear Fuel Cycle Facilities” and in the Safety Guide SSG-27 “Criticality Safety in the Handling of Fissile Material”.	X			
3	19	8.11	Last sentence: “Examples of this include liquid <u>liquid storage tanks for liquid radioactive waste</u> and remote handling systems within unmanned cells.”	To improve wording.	X			
2	20	8.12	“Decommissioning of a facility may be aided in certain instances by partial or total decontamination of the components, equipment and <u>SSCs structures</u> to be dismantled. Decontamination may be applied to internal or external surfaces and covers a broad range of actions directed at the removal or reduction of radioactive contamination in or on components, equipment and <u>SSCs structures</u> of the facility. ... Before any decontamination technique is selected, an evaluation of its effectiveness, of the potential for reducing total exposure and of the benefit in terms of generation of waste and effluents	1 st and 2 nd sentence: The abbreviation ‘SSCs’ has been introduced in Para 1.3. 4 th sentence: Please insert a comma after ‘effectiveness’ to avoid the misleading phrase “effectiveness of the potential for reducing total exposure”. See also the resolution	X			

			<p>should be performed. The decontamination process should also be evaluated to ensure it is compatible with waste processing systems as well as storage and/or disposal options. ... ”</p>	<p>table of Member States comments, comment on Para 8.12 provided by France.</p> <p>5th sentence: Decisions on the conduct of decontamination actions often have to be made at a time when a disposal facility is not yet available and, thus, the waste acceptance criteria for disposal are unknown. In such cases, the specifications for the decontamination process should comply with the waste acceptance criteria for storage.</p>				
2	21	9.17	<p>“If the decommissioning waste has to be stored on-site for a longer period of time after completion of decommissioning, an application for construction of a new storage facility for radioactive waste is required to be prepared by the licensee and submitted to the regulatory body for review, approval and issuance of a licence. Requirements and guidance concerning radioactive waste storage are provided in [11–13] [11, 39]. If spent fuel remains on-site, guidance found in [10] should be applied. ... ”</p>	<p>Both the IAEA Safety Guides WS-G-2.5 [12] and WS-G-2.6 [13] are focused on processing (i.e. pretreatment, treatment and conditioning) of radioactive waste. Specific guidance on storage of radioactive waste is provided in the Safety Guide WS-G-6.1. A reference [39] to this publication should be added and the existing ones to WS-G-2.5 and WS-G-2.6 should be deleted. See also our</p>		X		<p>DS447 and DS448 also address storage of radioactive waste as a part of the pre-disposal waste management.</p>

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

				comment on Para 1.18.				
3	22	Ref. [6]	“INTERNATIONAL ATOMIC ENERGY AGENCY, Release of Sites from Regulatory Control Upon <u>on</u> Termination of Practices, IAEA Safety Standards Series No. WS-G-5.1, IAEA, Vienna (2006).”	Citation of the correct title of the Safety Guide WS-G-5.1.	X			
3	23	Footnote No. 11 to Annex I, Para I-3, Item 12	“ ‘Public’ information on arrangements for physical protection and accounting and control of nuclear material that is included in the de-commissioning plan that does not contain sensitive security information.”	Editorial.	X			

DS452 Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 1 of 2 Country/Organization: Japan, Nuclear Regulation Authority (NRA) Date: 2015-10-09							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	Consolidation with DS403 should be considered for next time revision. There are so many similar paras. in DS452 and DS403. Any aspects that depend on specific facilities may be described in appendices if necessary.	Comment only.	X			No action required in this step. WASSC to discuss and decide.
2	1.11/2 (p.3)	...the associated safety environmental and environmental safety aspects...	The sequence “safety and environmental” is more appropriate.	X			
3	2.8/9 (p.8)	Specific provisions required by the regulatory body based on the environmental impact assessment should be overseen monitored to ensure implementation by the licensee, depending on the end state described in the final decommissioning plan.	DS452 refers to regulatory oversight, hence the term “oversee” is appropriate to keep consistency.	X			
4	2.15/3 (p.11)	Clarify “summary safety assessment”. Is it summary of the safety assessment for each phase and stage?	Clarification.	X			
5	3.4/6-7 (p.12)	Replace “The regulatory bodies responsible for decommissioning should identify and resolve any gaps or overlaps of authority and responsibilities” with “The legislation should establish clear lines of authority and responsibility, so as to avoid gaps or overlaps”.	There needs to keep consistency with para. 3.4 in DS403.	X			
6	After 3.7 (p.13)	Add a new paragraph same as DS403 to after para.3.7. 3.8.The regulatory body is also responsible for establishing: ●requirements relating to the criteria for safety, protection of workers and the public and protection of the environment during decommissioning of facilities; ●requirements for conducting radiological surveys for determining levels of contamination at the facility. ●criteria for clearance of material from regulatory control in accordance with national policy; ●radiological criteria for the removal of buildings and sites from regulatory control, and to ensure that adequate systems are in place for managing properly the removal of controls and the release criteria (unrestricted release and restricted release), especially when facilities/sites are released with restrictions on their future use;	The contents of para. 3.8 in DS403 are considered to be common with any facilities. In the finalization processes of DS403 and DS452, common aspects and facility specific aspects should be reexamined.			X	This is repetition (rephrase) of the requirement 3.3 from the GSR Part 6. Should also be removed from the DS403.
7	2.6/	Such issues are not addressed in this Safety Guide, as they are well addressed in other IAEA Safety Standards [3, 18, 27].	GSR Part7 is not a relevant document on remedial actions.		X		We consider the GSR Part 7 is relevant to the part “or to prevent

							further spread of radioactive substances, for instance contaminated water”.
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DS452 Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page 1 of 2 Country/Organization: Japan, Nuclear Regulation Authority (NRA) Date: 2015-10-09							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
8	5.6 (p.26)	Move this para. to appropriate location in Section 7 or 8.	As described in this para., this is independent with selection of strategies.			X	Your point is correct, but we consider it is important to emphasize in this section on strategy that decommissioning should start as soon as possible after the permanent shutdown, for both immediate and deferred dismantling strategy.
9	5.6/7 (p.26)	(such as removal of operational waste, removal of spent fuel, refurbishment disposition of excess equipment)	More appropriate examples.		X		Please see revised text, which also accommodates comment from the ENISS.
10	5.40/2 (p.83)	An example might be the change in environmental conditions such as the increasing of population distribution surrounding the facility making deferred dismantling unfeasible. such that an analysis involving an accident during the transportation of decommissioning waste would have to be reconsidered.	The example in the previous version of DS452 is appropriate because Section 5 discusses the selection of decommissioning strategy hence this paragraph should mention consequence of the environmental conditions for the selection of decommissioning strategy.	X			
11	6.9/6 (p.36)	The occurrence of incidents leading to spillage or inadvertent release of radioactive material, a spill, leaks or accident	Clarification.	X			
12	7.14(a) Last bullet (p.43)	Waste storage and/or disposal locations.	In some cases, both waste storage and disposal location are necessary for decommissioning projects.	X			

13	9.17/3 (p.64)	<p>Replace “On-site disposal of decommissioning waste is not a recommended practice, and is not addressed in this Safety Guide” with “There are no explicit descriptions regarding on-site disposal neither in this Safety Guide nor other relevant Safety Guides. However on-site disposal would be an option to dispose decommissioning waste if it meets safety requirements [14]”.</p> <p>Or</p> <p>On site disposal of decommissioning waste is not a recommended practice, and is not addressed in this Safety Guide.</p>	<p>If this option meets safety requirements (SSR-5), there is no reason to exclude it. Bear in mind that this option will be considered to incorporate in revision of SSG-29.</p> <p>This issue would not need to necessarily be mentioned in DS452.</p>		X	<p>The IAEA position is that on site disposal is not a recommended practice for decommissioning of facilities after normal operation, as it would lead to creation of tens or hundreds of disposal facilities in a country. It may be considered as an option in case of a decommissioning after an accident. Clarification is provided in the revised text.</p>
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**USA Comments on DS452 “Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities”
DS452 (Revision of Safety Guides WS-G-2.1 and 2.4)**

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: US NRC (Contact: Bobby Eid, Bobby.Abu-Eid@nrc.gov) Page 1 of 8. Country/Organization: USA/USNRC				Date: 10/11/2015			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	DS452 current version is comprehensive and well prepared in terms of contents. However, it can be enhanced further in edit, clarity, and minimization of redundancies. We recommend the document be edited further particularly in review of paragraphs and consolidation of text materials.	Minimization of redundancies, edit, clarity, and consolidation of text: Throughout the document there is significant redundancy in the content of the paragraphs. An effort should be made to review the paragraphs and consolidate the material.	X			Many specific comments pointed out examples of redundancies and requested clarifications or editorial changes. By addressing them we believe we addressed this general comment as well.
2	2.10	Para 2.10 Para appears to redefine the graded approach in IAEA Glossary. We suggest that Para 2.10 quote IAEA Glossary definition #2 as give below: “An application of <i>safety requirements that is commensurate with the characteristics of the facilities and activities or the source and with the magnitude and likelihood of the exposures.</i> ”	Clarity: Requirement 2 refers to a “graded approach,” but the approach is not defined. Without clearer discussion, grading of these approaches may not be optimized. We suggest insertion of IAEA Glossary definition of graded approach or at minimum citing IAEA Glossary.	X			

3	3.20/line 3	<p>3.20. A good safety culture is an important part of a decommissioning project since actions are being performed that may not be routine and specialist personnel may be used to perform some of these actions. The safety culture may suffer and it is the responsibility of the regulatory body coordinate with licensed party in order to promote the licensee to maintain a good safety culture throughout the life of the decommissioning project. In addition, the regulatory body should maintain its own management system and sufficient and trained staff, in order to be able to fulfil its responsibilities for decommissioning.</p>	<p>“...to promote the licensee.” may be misinterpreted.</p>	X			
4	<p>5.2/Line 3 VS 5.3/line 7</p>	<p>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]. Immediate dismantling is the preferred strategy by certain regulatory authorities, as it avoids transferring the burden of decommissioning to the future generations.</p> <p>5.3. The selection of a decommissioning strategy follows an iterative process. The selection</p>	<p>5.2 and 5.3 seem to be inconsistent.</p> <p>5.2/Line 3 states that “immediate dismantlement” is the preferred strategy. This concept is inconsistent with 5.3 line 7, which states a “preferred decommissioning strategy should be proposed...”</p> <p>We believe selection of a decommissioning strategy needs to be coordinated early with</p>	X			<p>Please see the revised text, which says that the immediate dismantling generally is the preferred strategy, but for a particular facility preferred strategy could be either immediate or deferred dismantling or their combination.</p>

		<p>of the decommissioning strategy should be based on an analysis of various options, which may lead to selecting a combined strategy, which consists of some degree of immediate dismantling actions, followed by a preservation of the remaining parts of the facility, which are then dismantled after a period of safe enclosure. Such combined strategy can include an early dismantling of some parts of the facility, usually externally accessible areas and auxiliary systems, while placing others, e.g., the reactor core, into a safe enclosure mode. A “preferred decommissioning strategy” should be proposed when developing the initial decommissioning plan in coordination with regulatory authorities.</p>	<p>regulatory authorities before submission of a decommissioning plan. If the preferred strategy by the operator is “deferred dismantling” then regulatory authorities may agree or discuss the pros and cons of such a strategy and define an alternate strategy based on cost and safety as well as other factors to ensure protection n of future generation.</p>				
5	5.2/Line 11	<p>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]. Immediate dismantling is the preferred strategy, as it avoids transferring the burden of decommissioning to the future generations. The immediate dismantling strategy should be understood as immediate and complete dismantling in a timely manner, with no decommissioning</p>	<p>The benefits of delayed dismantlement are not discussed for consideration. We suggest adding more discussion for clarity. As a minimum, reduced worker exposure, and financial strengthening of the decommissioning funds should be highlighted here. The last sentence should be deleted or qualified because deferred decommissioning or entombment may be the only practicable options available under certain</p>		X		<p>It is an IAEA position that entombment is not an acceptable option for decommissioning after normal operation. This is consistent with the requirements GSR Part 6. That is why we propose to keep the first sentence on “No</p>

		<p>phases delayed for many decades. There may be situations in which immediate dismantling is not a practicable strategy when all relevant factors are considered and the deferred dismantling option would be the most practical option. An example might be when one unit at a multi-unit plant ceases operation and decommissioning has to wait for other unit to cease operations before decommissioning of the first unit can start, because of common systems used by multiple units. Release from regulatory control without restrictions should be the preferred end state and ultimate objective of decommissioning. The “No action” (leaving the facility after operation as it is, and waiting for decay of radioactive inventory) and entombment (all or part of the facility encased in a structurally long lived material) should not be regarded as acceptable decommissioning strategies. “No action” would entail that the facility would remain under the operating licence and have to continue to meet the operating licence conditions.</p>	<p>circumstances. Monitoring and control by regulatory authorities is necessary for such decommissioning option.</p>				<p>action” and entombment.</p>
6	5.6/Line 7	<p>5.6. Decommissioning, whether based on an immediate or a deferred dismantling strategy, should commence shortly after permanent shutdown. Any transition period</p>	<p>Not clear why this is related to “operational tasks.”</p>	X			<p>Clarification provided in the revised text.</p>

		<p>between permanent shutdown and approval of the final decommissioning plan should be as short as possible and consistent with regulatory requirements. It such as 2 to 5 years, and should be managed under the operating license. Some preparatory actions for decommissioning may begin during the transition period. However, care should be taken to ensure that decommissioning funds are not used to perform operational tasks (e.g.; such as removal of operational waste, removal of spent fuel), disposition of excess-equipment).</p>					
7	5.16/Line 4	<p>5.16. Incidents or accidents may lead to a spread of contamination outside of the buildings of the facility, implying the need to implement remedial actions on the site where the facility is located. Such actions within the licenced site are usually considered a part of the overall decommissioning of the facility, for example could be the last phase of the decommissioning project.</p>	<p>This may not be an appropriate recommendation. If you have uncontrolled contamination outside a facility structural barrier, you will want to remediate this first to prevent the spread of contamination on and off site. A graded approach to safety based on assessment of risk to the public and a priority for containment of contamination should also be considered.</p>	X			
8	5.20/5.21/5.22/5.23	<p>Consolidate into a single item</p>	<p>All of these paragraphs address factors in selecting a strategy. They should be listed together. Use bullets if necessary. Easier for</p>		X		<p>5.20 kept separately as an introductory paragraph.</p>

			the user to comprehend.				
9	5.24	Para 5.24 is very similar to 5.10. Recommend you delete this one and include any material unique to 5.24 into 5.10.	Redundancy: This item is very similar to 5.10. Recommend you delete this one and include any material unique to 5.24 into 5.10.			X	Your point is correct (very similar), but we see a difference between 5.10 and 5.24 and prefer not to delete 5.24. 5.10 introduces a site strategy for a multi-facility site, while 5.24 provides example how presence of other facilities on site (one of the factors to be considered) may influence selection of strategy for a particular facility. 5.24 has been revised to accommodate another comment from France.
10	5.34/Line 5	5.34. When selecting a decommissioning strategy, the licensee should consider the results of the safety reviews performed during the operation of the facility. These safety reviews should be part of the regulatory bodies oversight	Clarit: This paragraph states "...to confirm the 'preferred decommissioning strategy' is still applicable." The preferred strategy is defined in 5.2.; which may not be the selected strategy. .	X			Please see the response to your comment #4, we think it accommodates this comment as well.

		function. Results of conformity checks and re-assessment should be addressed and analysed to confirm the “preferred decommissioning strategy” is still applicable. When the decision to permanently shut down a facility is a result of such periodic safety review process, the identified weakness of the safety demonstration should be considered carefully in the perspective of decommissioning.					
11	5.44/Line 3	5.44. The discussion above on the individual factors affecting the choice of decommissioning strategy sometimes includes statements about the preferred decommissioning strategy for a particular factor, in order to provide examples. However, the selection of a preferred strategy will have to consider and balance all the factors together, rather than consider each factor in isolation.	The preferred strategy in immediate dismantlement as defined in 5.2. This needs to be consistently applied throughout this comment.	X			Please see the response to your comment #4, we think it accommodates this comment as well.
12	Section 5	Comment: No mention is made of the financial consideration in the selection of the strategy. Premature shutdown will almost always require a delayed dismantlement strategy decision which will be financially based.	Clarity: Need to address financial consideration in selection of strategy particularly for premature shutdown.			X	Financial considerations are covered in the last bullet of 5.7 and in 5.8.
13	6.3(a) and (b)	Consolidate into a single item	The items are very similar and should be combined into a single item to eliminate redundancy.		X		Please see the revised items. We prefer to keep

							them separate, as one is related to the “soft” actions (planning during facility lifetime, licensing), and the other covers physical works done during transition.
14	6.4	Recommend adding a new item addressing aspects of the decommissioning cost estimates.	A new item or items should be added that <i>define</i> aspects of the decommissioning cost estimate (DCE). 6.4 just starts talking about it, but it is not defined to this point (ie what is its purpose, when should it be done and revised, etc etc).	X			Please see the second sentence added to para 6.2 and the new para 6.4.
15	7.4/Line 4	7.4. For many older existing facilities, decommissioning may not have been considered at the design stage or during construction and subsequent operation. For these facilities, planning for decommissioning should start as early as possible once the deficiency omission has been recognized, such as within 1 to 3 years. Furthermore, in addition to	The guidance for older plants with no prior decommissioning planning is not implementable (...once the <i>omission is recognized...</i>). This recommendation should be tied to other criteria, for example, within the permissible timeframe after 5 years of the issuance of this	X			

		planning for decommissioning, possible modifications to buildings and systems during the remaining operating life 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.	guidance document.				
16	7.10(a)	a) Preferably be based on the immediate dismantling strategy; however, deferred dismantling of individual facilities may be considered, for example, in the case of a multi-facility site, or a premature shutdown;	While immediate is preferred, premature may be more likely, and the DTF may not support immediate dismantlement at the time of shutdown.	X			
17	7.10	This list should include: (g) Inclusion of an environmental assessment (h) Inclusion of a Decommissioning Schedule based on the strategy.	These should be part of any decommissioning plan			X	Environmental assessment for decommissioning is usually not performed in support of an initial decommissioning plan. Decommissioning schedule is already covered under (c).
18	7.16	This item should be re-located to a more appropriate section. It	Item not associated with “Initial Decommissioning Plan Updating.”		X		Text revised to put the

		seems out of place here.					consideration into the context of updating the initial decommissioning plan.
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