Resolutions of MSs' comments

Vienna, 2022 11.28 -12. 02

Version 1 (05-12-2022)

Comments from MSs

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Type of the comments

Editorial:	40%
Clarification:	20%
Technical matters:	25%
Interfaces	5%

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	Finland-1	General	Please use terms radioactive waste and radioactive source instead of terms waste/radwaste and source now used in the document.		x			Editorial
2.	Germany-1	General	*General comment: the language of this Safety Guide is very complicated and not always understandable; additionally, some terms are outdated. It would be a great help, if Standards Specialists familiar with the IAEA terminology can have a look on current document now, and not only – as usually – after Step 11 in order to fix all the wording.*	**Relevance 1**	x			Editorial
3.	Russia/ROSATOM-1	General	General editorial comment. The draft document use a range of synonyms for the same subject, e.g. “liquid effluents”, “liquid discharge”, “liquids”, “effluents”, “fluids”, “contaminated water”, “radioactive waste water”, “liquid waste”. Such a diversity could not be commended for a technical document. It is advisable to be limited by the term “liquid waste”.Moreover, in English technical documents there are already adopted terminology and abbreviations, such as Liquid Waste (LW), Radioactive Liquid Waste (RLW), Low Level Liquid Waste (LLLW) or High Level Liquid Waste (HLLW), etc. Any different terms should be applied only in case of specific types of waste like spent decontamination solutions	-	x			Editorial India-2

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4.	Germany-2	General	*General comment: this Safety Draft promises to serve as a valuable interface between nuclear and radiological aspects in design. It looks like - from NUSSC point of view – that not all design aspects are being incorporated in current document and it is very difficult to do this in the frame of Comments by Member States. We would like to suggest to organise an expert meeting to discuss and clear all the issues.*	**Relevance 1**	x			The expert meeting was organized (28 November– 2 December 2022) *All radiation protection design aspects that were included in NS-G-1.13 and some~~many~~ new ones are incorporated in current document.*
5.	Finland-2	General		Foreign material exclusion (FME) is only mentioned briefly once in this draft. It is an important part of the goal to prevent fuel cladding failures and it should be taken into account already in the design phase. Please consider adding a paragraph, where FME is handled.	x			New para 5.3A in section 5saying that FME should be excluded: 5.3A Foreign material exclusion (FME) is vital to the safe and reliable operation of nuclear power plants. The entry of foreign material into primary or secondary plant systems can cause equipment damage leading to high radiation levels and avoidable worker dose. Steps should be taken at the design stage to aid FME including provision for temporary covers during maintenance and equipment for system inspection following maintenance.
6.	Finland-3	General		Use of robotic could be available more in the future replacing for	x			The use of robotic and remote-control technics

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				example the routine dose-rare measurements. Robotics could be considered also during the operational phase of NPPs more widely not only during decontamination. To enable robotics could be taken in consideration already in the design phase.				recommended for the design in the draft in Section 5, 6., 7 (e.g.: paras. 5.33., 5.68., 7.19)
7.	Finland-4	General	Could you clarify the concept of dose constraints for occupational exposure and especially its relation to the design targets and optimization?	In the footnote on page 16 it is mentioned that relevant dose constraints for occupational exposure are established and used by licensees. As the dose constraint is defined as a source-related concept, what are the relevant dose constraints in case of occupational exposure (examples?), and how do or should they affect the optimization? Should they act as a tool for the optimization of the protection, which brings them very close to the design targets, or should they pose an additional boundary to the optimization, only below which the optimization can be done. In the latter case there is a risk of a suboptimal result.		x		Vaughan: – We should state that The approach to dose constraints is as described in GSR Part 3 paras 1.22 – 1.29.
8.	Germany-3	1.2.	The recommendations on radiation protection provided in this Safety Guide are consistent with the IAEA Safety Standards Series No. GSR Part 3, Radiation Protection and Safety of Radiation Sources:	Please introduce abbreviation BSS here, as this abbreviation is used later in text, especially in para. 2.34.			x	Editorial (Editors will check)

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			International Basic Safety Standards (BSS) [2].	**Relevance 2**				
9.	Germany-4	1.6	The purpose of this Safety Guide is to provide recommendations for ensuring radiation protection in (1) the design of new nuclear power plants, (2) design modifications to operating plants, and (3) checking the adequacy of the design at different stages of the lifetime of a nuclear power plant ~~safety reviews and assessments of operating plants (for example as part of the comprehensive evaluation of safety or the periodic safety review of the plant).~~ The recommendations are provided to assist in meeting the applicable safety requirements, in particular those established in SSR-2/1 (Rev. 1) [1], under the fundamental safety objective, that is "to protect the people and the environment from harmful effects of ionizing radiation", by establishing and maintaining in ~~nuclear installations~~ nuclear power plants effective defences against radiological hazards.	Safety reviews of operating plans should be not in the focus of this guide, which is dedicated to the design according to the title. Safety assessments are specifically dealt with by other IAEA documents, e.g. GSR Part 4 (Rev. 1).Additionally, this Guide is dealing with nuclear power plants, its recommendations are not for all nuclear installations. **Relevance 1**		x		To keep both text (3) checking the adequacy of the design at different stages of the lifetime of a nuclear power plant safety reviews and assessments safety reviews and assessments of operating plants (for example as part of the comprehensive evaluation of safety or the periodic safety review of the plant). Second part of comment "nuclear installations" removed". ~~rejected as it is a reference to the fundamental safety objective that is meant for all nuclear installations~~
10.	UK-1	1.9/5	The wording, "site personnel and the public and the environment" could be simplified to "site personnel, the public and the environment". Also there appears to be a mix of wording between 'personnel' and 'workers', also for 'public' and 'people' throughout the text.	Clarity of wording.	x			Editorial *Expert Team proposal* (2) ~~Describes~~ Provide recommendations for the measures to be taken in the design for the radiation protection of site personnel, ~~and~~ the

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								public and the environment.”
11.	Germany-5	1.10	In addition to the measures that are required to protect site personnel, ~~and~~ members of the public and the environment when the plant is in operational states and during decommissioning, this Safety Guide also deals with accident conditions, including severe accidents.	Please put in line with SF-1 and with other paras of current document, for consistency. **Relevance 2**	x			
12.	Russia/RO SATOM-2	1.10	In addition to the measures that are required to protect site personnel and members of the public when the plant is in operational states and during decommissioning, this Safety Guide also deals with accident conditions, including severe accidents and **design extension accidents (conditions)**.*	Add "design extension accidents (conditions)" (see para 2.17).	X			Modified text: …, this Safety Guide provides also recommendations for radiation protection aspects of design for ~~deals with~~ accident conditions, including design extension conditions and severe accidents.
13.	Germany-6	Chapter 2	*The huge amount of direct quotations in Chapter 2 affects the reading flow und seems not be useful for a Safety Guide, therefore we suggest using more indirect citations.*	**Relevance 1**			x	Editorial See resolution of Germany-7
14.	Germany-7	Chapter 2	*Chapter 2 contains to many quotations of requirements, which are not or only weakly related to the design. There are also duplications. The quotations should be reviewed and limited to the required references. Examples are paras 2.10 (last paragraph), 2.11, 3.29, 2.13, 2.14, 2.15, 2.16 (partly), 2.17, 2.18, 2.19 (partly), 2.22, 2.25 (partly)*	Safety guides should be consistent and focused on the topics indicated by the title. **Relevance 1**	x			Introduction after the title Safety Objectives with explanation why there are 5 subtitles and summary sentence after each subtitle. ~~*Proposed text:*~~ ~~SAFETY OBJECTIVES~~ ~~This Safety Guide interfaces with other Safety Guides that are~~

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								~~also intended to help meet relevant safety requirements for radiation protection of workers, the public, and the environment. The following section provides a summary of the most relevant safety requirements and recommendations that underlie the recommendations in this Safety Guide and that are recommended to be taken into account. The requirements and recommendations are subdivided and associated with different aspects of the safety objectives.~~ • ~~Radiation protection in design~~ ~~This section provides the most important requirements of SSR-2/1 (Rev. 1) [1] that mainly addresses the provisions that should be made in the design of nuclear power plant concerning the radiation protection~~ • ~~Safety in design~~ ~~This section provides the most important requirements of SSR-2/1 (Rev. 1) [1] and~~

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								~~GSR Part 3 [2] addressing the general safety in design and having a strong relation to the radiation protection in design.~~ • ~~Safety assessment in the design~~ *To add at the end of specific paras of section 2 references to the later paras (recommendations) in later sections how to fulfil particular requirements.*
15.	Germany-8	2.1 Line 7	… This Safety Guide is closely related to ~~has interface with~~ other Safety Guides that are also aimed to help meeting the relevant safety requirements for the radiation protection of the workers, the public and the environment. A summary of the most relevant safety requirements motivating the recommendations provided in this Safety Guide are provided in the below paras of this section.	Term "interface" is semantically occupied in technical field, as e.g. "interface with other equipment or system", we suggest to use another wording here **Relevance 2**			X	Editorial To keep interface, as it includes governing and closely related
16.	Germany-9	2.4.	In Requirement 81 *"Design for radiation protection"* of SSR-2/1 (Rev. 1) [1] it is stated: …	Is the name/the title of requirement needed? If yes, do it consistently in all the text, name all of mentioned requirements and do it in the same style, please **Relevance 1**	x			Editorial The document was checked Editors will check also during the editorial review. The title of the Requirement 5 was added in the para 2.3. "In Requirement 5

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								"Radiation protection in design" of SSR-2/1 (Rev. 1) [1]…"
17.	Japan-1	2.9	In the design of the plant for the minimization of the radiation impact to the site personnel, the public and the environment, ~~Requirement 13 of GSR Part 3 [2] "Safety assessment"~~ Requirement 12 of SSR-2/1 (Rev. 1) [1] "Features to facilitate radioactive waste management and decommissioning" should be taken into account:	The referenced requirement and its text are inconsistent. Requirement 13 of GSR Part 3 is a requirement for safety assessment and is quoted in para 2.11. Requirement 12 of SSR-2/1 (Rev.1), whose text remains unmodified in this para, seems to be more appropriate for this para.	x			Editorial Mistake by referencing to Req.
18.	Germany-10	2.9	In the design of the plant for the minimization of the radiation impact to the site personnel, the public and the environment, Requirement ~~13~~ 12 of ~~GSR Part 3 [2] "Safety assessment"~~ SSR-2/1 (Rev. 1) [1] "Features to facilitate radioactive waste management and decommissioning" should be taken into account: "Special consideration shall be given at the design stage of a nuclear power plant to the incorporation of features to facilitate radioactive waste management and the future decommissioning and dismantling of the plant."	Mistake by referencing to Req. **Relevance 1**	x			Editorial Mistake by referencing to Req.
19.	Germany-11	2.10 Line 13	… Safety guides SSG-68 [15], Design of Nuclear Installations Against External Events Excluding Earthquakes, SSG-67 [16], Seismic Design for Nuclear Installations, IAEA Safety Standards Series, SSG-9 (Rev. 1) [17], Seismic Hazards in Site Evaluation for Nuclear Installations, NS-G-2.13 [18], Evaluation of Seismic Safety for Existing Nuclear	The full titles of current Safety Guides should be added, as they are mentioned in this publication for the first time here. **Relevance 2**	x			Editorial

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			Installations, NS-G-3.2 [19], Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation for Nuclear power Plants, and GSG-10 [20], Prospective Radiological Environmental Impact Assessment for Facilities and Activities, provide recommendations for the assessment or reassessment (for safety reviews) of the suitability of a site and also for analysis of secondary and cascading effects of external hazards for designing or assessing the effective radiation protection measures and arrangements.					
20.	USNRC-1	2.13	Such assessment should be performed in accordance with the regulatory body's requirements, per Requirement 13 of GSR Part 3 [2], with particular attention to the requirements from paras 3.31 -3.36 of GSR Part 3 [2].	Add red text. Regulatory bodies set requirements for safety assessments, any guidance pertaining to such assessments should remind readers that these requirements prevail.		x		Such assessment should be performed in accordance with the Requirement 13 of GSR Part 3 [2], "Safety assessment" with particular attention to the requirements from paras 3.2931 -3.36 of GSR Part 3 [2]. Safety assessment in the design process should be carried out also in accordance with Requirement 10 "Safety assessment" of SSR-2/1 (Rev. 1) [1]. See also USNRC-2 comment resolution
21.	Germany-12	2.13	Safety assessment on radiation protection should be performed at different stages ~~or phases~~, including siting ~~site evaluation~~, design, manufacturing, construction,	First, we would like to suggest to stay in line with wording of GSR Part 3 for this para.As next, it is necessary to include Requirement	x			See USNRC-1 comment resolution

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			assembly ~~of structures, systems and components (SSC)~~, commissioning, operation, maintenance, and decommissioning (or closure) of NPPs. Such assessment should be performed in accordance with the requirements from paras 3.31 - 3.36 of GSR Part 3 [2]. Safety assessment in the design process should be carried out in accordance with Requirement 10 "Safety assessment" of SSR-2/1 (Rev. 1) [1]	on safety assessment in design from SSR-2/1. **Relevance 1**				
22.	UK-2	2.14/2	The word 'licensing' is quite specific. Can it be changed to 'authorisation'?	Clarity of wording.	x			Editorial
23.	USNRC-2	2.15	The safety assessment on radiation protection should be regularly updated, consistent with national requirements (e. g. as part of the comprehensive evaluation of safety or the periodic safety review of the plant).	Add red text. Accounts for regulatory frameworks that do not conduct PSRs.	x			
24.	UK-3	2.15A/2	As above (comment 2).	Clarity of wording.	x			Editorial
25.	USNRC-3	2.16	In accordance with these requirements, it should be demonstrated in a conservative manner that key plant parameters do not exceed the specified design limits and that all design basis accidents have no or only minor radiological impacts, on or off the site, and do not necessitate any off-site protective actions (e. g. evacuation). In some cases, protective actions may be required if the national regulatory framework includes consideration of postulated accidents that result in damage to the reactor core and subsequent release	Add red text. U.S. regulatory framework considers maximum hypothetical accidents within the definition of Design Basis Accidents. MHAs assume core damage and fission product release.Could also reference design extension conditions being included within the regulatory framework (DEC is defined in SSR 2-1)		x		To delete the text: ~~In accordance with these requirements, it should be demonstrated in a conservative manner that key plant parameters do not exceed the specified design limits and that all design basis accidents have no or only minor radiological impacts, on or off the site, and do not necessitate any off-~~

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			of radioactive material within its design basis accident analysis requirements.					~~site protective actions (e. g. evacuation)~~. To keep : Dose limits for workers (including those who are controlling and mitigating design basis accidents) should be considered in the design criteria. Further recommendations are provided in para. 6.14. To keep: Recommendations 6.14., 6.23., are provided in Section 6. ~~***Thomas will modify 6.14 adding one more general recommendation***~~. Text was added to the 6.14.
26.	Finland-5	2.16	Proposed modification: ***(pipes, ventilation systems, areas of post-accident sampling systems etc.)***.	Please refer to para 6.5.Instead of only limit to pipes containing heavily contaminated liquids, it might be worthful to consider also other possible radiation sources generated by an accident situation (ventilation ducts, filters, structural weaknesses if exists, etc.)	x			To include in Section 6. in Para 6.5. Safe routes should also avoid areas having potential for high dose rates due to the presence of atmospheric contamination or sources of external radiation possible generated by accident situation (pipes, ventilation systems, areas of post-accident sampling systems etc.). See also Germany-13 resolution

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27.	Germany-13	2.16 Line 8	…. In accordance with these requirements, it should be demonstrated in a conservative manner that key plant parameters do not exceed the specified design limits and that all design basis accidents have no or only minor radiological impacts, on or off the site, and do not necessitate any off-site protective actions (e. g. evacuation). Dose limits for workers (including those who are controlling and mitigating design basis accidents) should be considered in the design criteria.C Further recommendations on provisions, which should be made for shielding the radiation, are provided in para. 6.14.	May we ask you to check if reference to para. 6.14 was intended here? If YES, please indicate that further recommendations are on provisions, which should be made for shielding the radiation, as this is not obvious. **Relevance 2**		x		To delete: ~~In accordance with these requirements, it should be demonstrated in a conservative manner that key plant parameters do not exceed the specified design limits and that all design basis accidents have no or only minor radiological impacts, on or off the site, and do not necessitate any off-site protective actions (e. g. evacuation).~~ Dose limits for workers (including those who are controlling and mitigating design basis accidents) should be considered in the design criteria. Further recommendations are provided in para. 6.14. and 6.23. in Section 6. In addition, safe routes should also avoid areas having potential for high dose rates due to the presence of atmospheric contamination or sources of external radiation possible generated by accident situation, see para 6.5. Recommendations 6.14. resolution of USNRC-3
28.	Israel-1	2.17	We suggest to consider the phrasing ***may be analysed*** referring to DEC, using best	Completeness		x		See resolution of Germany-14

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			estimate assumptions. That text refers to Requirement 20 of SSR-2/1. The relevant text in section 5.27 of SSR-2/1 is: *An analysis of DEC for the plant shall be performed* + a relevant footnote (no. 13): *The analysis of DEC for the plant could be performed by means of best estimate approach (**more stringent approaches may be used according to States' requirements**)*. We suggest to consider adding the remark regarding ***more stringent*** **approaches** (possibly as a footnote) to paragraph 2.17.					
29.	Russia/ROSATOM-3	2.17	In accordance with Requirement 20 of SSR-2/1 (Rev. 1) [1] the design extension condition (DEC) may be analyzed using best estimate assumptions. It should be demonstrated that the identified reasonably practicable provisions prevent severe fuel damage (DEC A) and mitigate severe accidents (DEC B). Make sure the potential on-site and off-site radiological consequences resulting from the DEC (given successful accident management measures) should be evaluated to demonstrate the compliance with acceptance criteria reflecting reference levels established by the regulatory body. The NPP is returned to a controlled state in which the fission chain reaction stops and continuous fuel cooling and confinement of radioactive substances within the established boundaries are ensured	Add the following: The NPP is returned to a controlled state in which the fission chain reaction stops and continuous fuel cooling and confinement of radioactive substances within the established boundaries are ensured;		x		See resolution of Germany-14 The added text covers the proposed modification: "Recommendations related to the safety analyses on DEC are provided in DS508 [20a], Assessment of the Application of General Requirements for Design of Nuclear Power Plants."
30.	Germany-14	2.17	In accordance with Requirement 20 of SSR-2/1 (Rev. 1) [1] the design extension condition (DEC) may be analysed using	Please make the statement of this para more precise.		x		In accordance with Requirement 20 of SSR-2/1 (Rev. 1) [1] the

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			best estimate assumptions and should be derived on the basis of engineering judgement, deterministic assessments and probabilistic assessments.	**Relevance 1**				design extension condition (DEC) may be analyzed using best estimate assumptions. ~~It should be demonstrated that the identified reasonably practicable provisions prevent severe fuel damage (DEC A) and mitigate severe accidents (DEC B).~~ Recommendations related to the safety analyses on DEC are provided in DS508 [20a], Assessment of the Application of General Requirements for Design of Nuclear Power Plants. The potential on-site and off-site radiological consequences resulting from the DEC ~~(given successful accident management measures)~~ should be evaluated to demonstrate the compliance with acceptance criteria reflecting reference levels established by the regulatory body. Further recommendations are provided in Section 6. ~~Completed issue. Javier will check the ref to DS508~~

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31.	Marocco-1	2.19	Title: Interfaces between safety and security, and safeguards	The content of the paragraph explain also interfaces between Safety, security and safeguards.			x	The topic doesn't relate to safeguards
32.	Germany-15	2.20	Provisions should be designed to ensure the protection and safety for all persons on the site in a nuclear or radiological emergency in line with the requirements stated in paras ~~5.41 and~~ 5.42 of GSR Part 7 [9] "5.42. Arrangements as ….. ~~stated in para. 5.41~~ shall also include ensuring the provision, for all persons present in the facility and on the site, of:…..	Clarification and simplification **Relevance 2**		x		Text was modified "…….in line with the requirements stated in paras ~~5.41 and~~ 5.42 of GSR Part 7 [9] "5.42. Arrangements as ….. ~~stated in para. 5.41~~ shall also include….."
33.	Russia/ROSATOM-4	2.20	Provisions should be designed to ensure the protection and safety for all persons on the site in a nuclear or radiological emergency in line with the requirements stated in paras. 5.41 and 5.42 of GSR Part 7 [9].**Such provisions should include measures in case of simultaneous design extension accidents at several NPP units or any other nuclear facilities located at the NPP site accompanied by disturbances of infrastructure outside the NPP site (for example, blockage of access roads, failures of the NPP power supply, communication failures).**	Add *include measures in case of simultaneous design extension accidents at several NPP units or any other nuclear facilities located at the NPP site accompanied by disturbances of infrastructure outside the NPP site (for example, blockage of access roads, failures of the NPP power supply, communication failures). That addition may be important for SMRs when several units may use the same safety infrastructure.		x		~~To check whether Section 6 contains that proposal and to make a~~ Ref to the para 6.12 in Section 6 was given at the end of 2.20.: The radiation protection provisions in the design, should also include measures in case of simultaneous design extension accidents at several NPP units, see para. 6.12. **Para 6.12** To the end the text was added .. Provisions, should be designed to ensure the protection and safety for all persons on the site in a nuclear or radiological emergency, and should include measures in case of simultaneous design

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								extension accidents at several NPP units or any other nuclear facilities located at the NPP site accompanied by disturbances of infrastructure outside the NPP site (for example, blockage of access roads, failures of the NPP power supply, communication failures).”
34.	Marocco-2	Section 2	Interface between nuclear safety and security It is proposed to add the following document of the IAEA: “Technical Report Series 1000: The Nuclear Safety and Nuclear Security Interface: Approaches and National Experiences”	This document is a reference to member states to learn from best practices, challenges and opportunities of the effective management of the interface between nuclear safety and nuclear security for facilities and activities.			x	Preferably not to refer to lower-level doc unless there are radiation protection issues
35.	Germany-16	2.22 Line 9	… Other recommendations about the information and communication systems are provided in Section 6 of this Safety Guide.	The facilities for emergency preparedness and response are required to include diverse communication systems, not only one: Req. 37 of SSR-2/1 (Rev. 1), Req. 26 of GSR Part 7 and para 4.9 of SSG-62. Can you please make this slight, but important change in paras 5.17, 7.19 and 8.9 as well? **Relevance 2**	x			Editorial
36.	Germany-17	2.24	… Recommendations to implement ~~meet this~~	Clarification	x			

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		Line 8	~~requirement~~ these arrangements are provided in sections 6 and 8 of this Safety Guide.	**Relevance 2**				Recommendations to implement ~~meet this requirement~~ these arrangements are provided in sections 6 and 8 of this Safety Guide. ~~*Thomas will bring paras from section 6 Tamas from Section 8*~~
37.	Germany-18	2.24	Regarding emergency planning zones and emergency planning distances, para. 5.40 of GSR Part 7 [9] requires the following: "~~5.40.~~ Within emergency planning zones and emergency planning distances, arrangements shall be made for the timely monitoring and assessment of contamination, radioactive releases and exposures for the purpose of deciding on or adjusting the protective actions and other response actions that have to be taken or that are being taken. These arrangements shall include the use of pre-established operational criteria in accordance with the protection strategy ..." Recommendations to implement these arrangements ~~meet this requirement~~ are provided in sections 6 and 8 of this Safety Guide	Clarification:1) Duplication of para's number is unnecessary;2) Arrangements are being discussed, not requirements **Relevance 2**	X			Editorial Check ~~Thomas will bring paras from section 6 Tamas from Section 8~~
38.	Expert meeting		Title above 2.25 To modify the higher-level title to include DOSE CONSTRAINTS		X			To modify the higher-level title to include DOSE CONSTRAINTS
39.	Belarus-4	2.25 p. 16	2.25. The design of the nuclear power plant should be such as to ensure that authorized dose limits and dose constraints for site personnel and the public shall not be in operational states (normal operation	Exceeding dose limits and dose constraints assessment cannot be done for the monthly and		X		(e. g. ~~monthly, quarterly, or~~ annually) in operational states …

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			and anticipated operational occurrences) and decommissioning.	quarterly periods time on the design stage. On the design study the annual dose assessment is enough for radiation safety assessment the design project. Due to the fact that there are no data about monthly and quarterly radionuclides discharges on this stage. This dose assessment can be applied only while the operation stage. Moreover, the exceeding dose limits assessment during normal operation of the NPP can be carried out on the basis of not exceeding the annual dose limits of emissions, according to the data on emissions for the month, quarter and year.				
40.	USNRC-4	2.25	In order to comply with the requirements of GSR Part 3 [2], the authorized dose limits and dose constraints should not exceed the values of the dose limits established in GSR Part 3 [2].	Recommend deleting this statement. U.S. dose limit for lens of eye does not follow Schedule III of GSR Part 3 (US limit is 150 mSv, IAEA limit is 50 mSv). Earlier in para 2.25 there is a reference to a footnote 3 at the bottom of page 16 of DS524 which acknowledges that dose limits are established by the government or regulatory body. Similar statements appear as references to GSR Part 3 later in paragraph 2.25, as well. The	X			To delete the second sentence ~~In order to comply with the requirements of GSR Part 3 [2], the authorized dose limits and dose constraints should not exceed the values of the dose limits established in GSR Part 3 [2].~~

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				statement to the left seems contrary to that perspective.				
41.	Germany-19	2.25	The design of the nuclear power plant should be such as to ensure that authorized dose limits and dose constraints for site personnel and the public will not be exceeded over specified periods (e. g. monthly, quarterly, or annually) in operational states (normal operation and anticipated operational occurrences) and decommissioning. In order to comply with the requirements of GSR Part 3 [2], the authorized dose limits and dose constraints should not exceed the values of the dose limits established in GSR Part 3 [2]. For workers who do not enter the designated areas (supervised areas and controlled areas), the authorized dose constraints should be set at the same level as the individual dose limit for members of the public (GSG-7 [10]). ~~Requirement 12 of GSR Part 3 [2] states that: "The government or the regulatory body shall establish dose limits for … public exposure, and registrants and licensees shall apply these limits." Paragraph 3.120 of GSR Part 3 [2], which relates to responsibilities specific to public exposure, states that: "3.120. The government or the regulatory body shall establish or approve constraints on dose and constraints on risk to be used in the optimization of protection and safety for members of the public. …" Paragraph 3.123 (e) of GSR Part 3 [2] states that: "3.123. The regulatory body shall establish or approve operational~~	Please check if it is necessary to repeat text from GRS Part 3 in this Safety Guide.We think this is redundant and suggest to delete. **Relevance 1**	X			To add one sentence to ref [2] *(From David)* For para 2.25 Instead of the second sentence "GSR Part 3[2] provides requirements for regulatory bodies to use in establishing dose limits and dose constraints (See GSR Part 3[2] Requirement 12, Para 3.120 and 3.123). ~~Requirement 12 of GSR Part 3 [2] states that: "The government or the regulatory body shall establish dose limits for … public exposure, and registrants and licensees shall apply these limits." Paragraph 3.120 of GSR Part 3 [2], which relates to responsibilities specific to public exposure, states that: "3.120. The government or the regulatory body shall establish or approve constraints on dose and constraints on risk to be used in the optimization of protection and safety for members of the public.~~

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			~~limits and conditions relating to public exposure, including authorized limits for discharges. These operational limits and conditions: … (e) Shall take into account the results of the prospective assessment for radiological environmental impacts that is undertaken in accordance with requirements of the regulatory body …".~~					~~…" Paragraph 3.123 (e) of GSR Part 3 [2] states that: "3.123. The regulatory body shall establish or approve operational limits and conditions relating to public exposure, including authorized limits for discharges. These operational limits and conditions: … (e) Shall take into account the results of the prospective assessment for radiological environmental impacts that is undertaken in accordance with requirements of the regulatory body …".~~
42.	Marocco-3	Section 2 2.25	APPLICATION DOSE LIMITS INTO DESIGN It is proposed to add requirements related to "DOSE LIMITATION" requirements 3.34-3.48 of the General Safety Guide No. GSG-7 Occupational Radiation Protection.	It Is proposed to add this reference, which gives more details on the requirements related to dose limits.	X			See Resolution of Germany-19 para. 2.25. Last two sentences: ...For workers who do not enter the designated areas (supervised areas and controlled areas), the authorized dose constraints should be set at the same level as the individual dose limit for members of the public ~~(GSG-7 [10]).~~ See for further recommendations on the application of dose constraints (para.3.28-3.33) and dose limits

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								(para. 3.34-3.48) of GSG-7 [10]. ~~To check (Tobias)~~ ~~To check (Tobias)~~
43.	Marocco-4	Section 2 2.25	Dose constraints It is proposed to add requirements related to "Dose constraints", 3.28-3.33, of the General Safety Guide No. GSG-7 Occupational Radiation Protection.	It is proposed to add this reference, which gives more details on the requirements related to Dose constraints (The objective; Dose constraints for occupational exposure and public exposure…) It is suggested also to give examples of dose constraint.	X			Marooco-4 resolution is already implemented in resolution of comment Marocco-3. "See for further recommendations on the application of dose constraints (para.3.28-3.33) and dose limits (para. 3.34-3.48) of GSG-7 [10]."
44.	UK-4	2.26	Discharge limits for specific radionuclides in liquid and gaseous effluents (e. g. annual, quarterly, monthly, daily — the shorter periods permit increased release rates over short time periods and thus increased operational flexibility) ~~should be derived from the application of the authorized dose constraints for representative persons.~~ Suggest change the highlighted text to: …should be as low as reasonably achievable, allowing only minimal headroom above expected discharges without unduly restricting normal operation and planned decommissioning tasks.	Highlighted text does not align with UK limit setting guidance. We do not set limits based on the dose constraints; we expect limits to be reduced further where possible, in line with the need to reduce discharges "as low as reasonably achievable". We set limits based on the use of best available techniques (BAT) by operators to minimise disposals and their impact, with the minimum headroom necessary to permit "normal" operation or decommissioning of a facility. Alternative text provided as shown.			x	The original text aligns with GSR part 3, but the proposed text does not.
45.	Germany-20	2.28 first bullet	- The radiation exposure should be reduced by means of radiation protection measures to values such that further expenditure for design, construction, ~~and~~ operation and	This point should also apply to the decommissioning of NPP.	X			

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			decommissioning would not be warranted by the associated reduction in radiation exposure (economic factors).	**Relevance 1**				
46.	USNRC-5	2.28	Issues such as reducing major disparities in the occupational doses received by workers of different types who work within the controlled area and avoiding arduous working conditions in radiation areas (social factors) should be taken into account in the design. The types of workers who could potentially receive the highest doses include maintenance and inspection personnel and health physics staff.	Recommend deleting. The intended effect is obtained by following para 2.2. Also, this seems to be a misapplication of the societal factors associated with the concept of optimization. The idea is to ensure there exists an equitable distribution of dose for a particular planned exposure (i.e., the exposure associated with completing a certain type of work), not that disparities between workers of different types (e.g., electricians, pipe fitters inspection staff etc) are reduced. Lastly, this seems to be more of an operational radiation protection concern and not something that can be addressed during the design phase.See ICRP 101 para 16 for further background on societal considerations regarding exposure: the idea is focused on protecting from uneven distribution of benefits and detriments.	x			Issues such as reducing major disparities in the occupational doses received by workers of different types who work within the controlled area and avoiding arduous working conditions in radiation areas ~~(social factors)~~ should be taken into account in the design. The types of workers who could potentially receive the highest doses include maintenance and inspection personnel and health physics staff.
47.	UK-5	2.29	After the first sentence, add a sentence to emphasise the importance of the hierarchy of preventative measures, e.g. 'The measures should be considered in the hierarchy of preventative measures, such that passive and engineered solutions are	The hierarchy of preventative measures is vital to prevent undue pressure and emphasis on workers protecting themselves. "hierarchy of preventative	X			e.g. The measures should be considered in the hierarchy of preventative measures, such that passive and engineered solutions are

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			looked at before active and procedural controls.'	measures" is the term used in GSR part 3.				looked at before active and procedural controls.
48.	USNRC-6	2.29A	The design of the NPP should be such as to ensure that during operational states the corresponding dose limits and dose constraint for site personnel and for public will not be exceeded. It should be demonstrated that the radiological acceptance criteria for operational states, identified in accordance with the dose limits and dose constraints and reflected in the design limits, are met in the design. Further recommendations on radiological acceptance criteria are provided in SSG-2 (Rev. 1)	Recommend deleting. The statement does not belong in the section on optimization. Additionally, the intent is covered by para 2.3	X			To delete 2.29A
49.	Germany-21	2.29A	*The design of the NPP should be such as to ensure that during operational states the corresponding dose limits and dose constraint for site personnel and for public will not be exceeded. It should be demonstrated that the radiological acceptance criteria for operational states, identified in accordance with the dose limits and dose constraints and reflected in the design limits, are met in the design. Further recommendations on radiological acceptance criteria are provided in SSG-2 (Rev. 1) [24] (see para 4.8 about normal operation and paras 4.9 and 7.23 about anticipated operational occurrences).*	Connection to "Optimization of radiation protection and safety" (as title of the section) is not recognisable. Duplication with 2.25 and 2.26.Can you please reformulate this para so that the intended statement is clear? Otherwise delete. **Relevance 1**	x			To delete 2.29A To add to para 2.29 …..and 7.23 about anticipated operational occurrences.
50.	USNRC-7	2.30A	The design of the NPP should be such as to ensure that the dose limits for site personnel and thereference levels for public will not be exceeded during accident conditions. It should be	Recommend deleting. The statement does not belong in the section on optimization.	x			To delete 2.30A *To add to para 2.29 .....and 7.23 about*

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			demonstrated that the corresponding radiological acceptance criteria, identified in accordance with the dose limits andreference levels and reflected in the design limits, are met in the design. Further recommendations onradiological acceptance criteria for accident conditions are provided in SSG-2 (Rev. 1) [24] (e. g. inparas 4.10, 4.11, 7.31, 7.46, 7.58 and 7.60).	Additionally, the intent is covered by the first part of para 2.16				*anticipated operational occurrences.*
51.	Germany-22	2.30A	*The design of the NPP should be such as to ensure that the dose limits for site personnel and the reference levels for public will not be exceeded during accident conditions. It should be demonstrated that the corresponding radiological acceptance criteria, identified in accordance with the dose limits and reference levels and reflected in the design limits, are met in the design. Further recommendations on radiological acceptance criteria for accident conditions are provided in SSG-2 (Rev. 1) [24] (e. g. in paras 4.10, 4.11, 7.31, 7.46, 7.58 and 7.60).*	Connection to "Optimization of radiation protection and safety" (as title of the section) is not recognisable (simar to para 2.29A). Can you please reformulate this para so that the intended statement is clear? Otherwise delete. **Relevance 1**	x			To delete 2.30A *To add to the end of para 2.30.:* Further recommendations on radiological acceptance criteria for accident conditions are also provided in paras 4.10, 4.11, 7.31, 7.46, 7.58 and 7.60 of SSG-2 (Rev. 1) [24].
52.	Germany-23	2.31 Second and third bullet	…— IAEA Safety Standards Series No. GSG-9 [23], ~~Regulatory Control of Radioactive Discharges to the Environment~~, which provides guidance on application of the principles of radiation protection and the safety objectives associated with the control of discharges and on the process for authorization of discharges; — IAEA Safety Standards Series No. GSG-10 [20], ~~Prospective Radiological Environmental Impact~~	GSG-9 has been mentioned for the first time in para. 2.26, so the title should not be mentioned there. The first time GSG-10 is mentioned is para 2.10, please integrate the Guide's title there. **Relevance 2**	X			

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			~~Assessment for Facilities and Activities~~, which describes a framework and methodologies for prospective radiological environmental impact assessment.					
53.	Germany-24	2.32 Line 8	… The wider aspects of optimization of protection and safety are covered in GSG-3 [26], Safety Case and Safety Assessment for the Predisposal Management of Radioactive Waste, on the predisposal management of radioactive waste.	GSG-3 is mentioned here for the first time, please insert its title, to be consistent with quotation of other documents **Relevance 2**	A			
54.	Germany-25	2.34 Line 3	…. in accordance with para 2.6. of GSR Part 5 [7] which states:"~~2.6.~~ Requirements for radiation protection have to be established at the national level, with due regard to the BSS ~~[2]~~. In particular, the BSS require radiation protection to be optimized for any persons who are exposed as a result of activities in the predisposal management of radioactive waste, with due regard to dose constraints, and require the exposures of individuals to be kept within specified dose limits."	The abbreviation "BSS" in the quotation must be explained, GSR Part 5 did it in para 2.5. In current Guide we suggest to introduce this abbreviation in para. 1.2, by the first mentioning of BSS via GSR Part 3, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards (BSS). Reference to [2] in the quotation is misleading, as in the original (GSR Part 5) this reference is not only numbered as [6], but is also leading to a document, different from [2]; we suggest to omit it. Additionally, duplication of para's number in the quotation is irritating, we guess this is not an IAEA standard. **Relevance 2**		X		~~Vaughan suggested the following wording for this paragraph and deleting the quote.~~ ~~Footnote on BSS~~ GSR Part 3 does not have the same specific requirement as the BSS regarding predisposal. Therefore the following wording is suggested for this paragraph and deleting the quote. Design features for the predisposal management of radioactive waste should be optimized to ensure that doses to workers are 'as low as reasonably achievable' (ALARA.

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55.	Germany-26	2.37 Line 4	… These technological systems are described in detail in other relevant IAEA safety guides on design of nuclear power plants, including SSG-52 [27], Design of the Reactor Core for Nuclear Power Plants, SSG-53 [28], Design of the Reactor Containment and Associated Systems for Nuclear Power Plants, SSG-56 [29], Design of the Reactor Coolant System and Associated Systems for Nuclear Power Plants, SSG-62 [30], Design of Auxiliary Systems and Supporting Systems for Nuclear Power Plants, SSG-63 [31], Design of Fuel Handling and Storage Systems for Nuclear Power Plants, and SSG-39 [32], Design of Instrumentation and Control Systems for Nuclear Power Plants.	Please introduce titles of these Safety Guides. **Relevance 2**	x			~~(Csilla, Javier)~~ Modified sentence: …Recommendations for these related ~~These~~ technological systems are provided ~~described~~ in detail in other relevant IAEA safety guides on design of nuclear power plants, including SSG-52 [27], SSG-52 [27], Design of the Reactor Core for Nuclear Power Plants, SSG-53 [28], Design of the Reactor Containment and Associated Systems for Nuclear Power Plants, SSG-56 [29], Design of the Reactor Coolant System and Associated Systems for Nuclear Power Plants, SSG-62 [30], Design of Auxiliary Systems and Supporting Systems for Nuclear Power Plants, SSG-63 [31], Design of Fuel Handling and Storage Systems for Nuclear Power Plants, and SSG-39 [32], Design of Instrumentation and Control Systems for Nuclear Power Plants.
56.	Israel-2	2.38 and 3.26	In paragraph 2.38 we suggest to correct as follows: ….design targets should be set for the	Clarity and Completeness			x	The text is in line with GSR Part 3 terminology

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			individual dose ~~and collective dose~~ to workers and for the individual dose to the representative person of the public and collective dose to the public. In paragraph 3.26, we suggest to add explicitly at the end of the paragraph: …as necessary for the design targets of the public collective dose.					
57.	Germany-27	2.38	To ensure that a design both reduces doses to levels that are as low as reasonably achievable (ALARA) and represents best practice, design targets should be set for the individual dose and collective dose to workers and for the individual dose to the representative person of the public.	This is the first time the formulation "as low as reasonably achievable" is used in text and is used out of any quotation. Abbreviation ALARA should be used here, and not first in Para. 5.35.Please use abbreviation ALARA as well in para 3.19. Additionally, please check if **ALARP** is here more suitable. **Relevance 1**	x			Editorial check To ensure that a design both reduces doses to levels that are ~~as low as reasonably achievable~~ ALARA To change as well in para 3.19. ~~as low as reasonably achievable~~ ALARA
58.	Germany-28	2.43	~~**Paragraph 1.20. of GSR Part 6 [8] states that: "1.20. The management of fresh nuclear fuel and the management of spent nuclear fuel and of radioactive waste generated during the operational phase of a facility are not usually considered part of decommissioning. …"**~~ Requirement 14 of GSR Part 6 [8] states that "Radioactive waste shall be managed for all waste streams in decommissioning". The management of the radioactive waste generated during the decommissioning should be considered in the	Please change this para to make it clear that "management of the radioactive waste generated during the decommissioning" is the second target for decommissioning. **Relevance 1**	x			Requirement 10 of GSR Part 6 [8] Requirement 14 of GSR Part 6 [8] states that "Radioactive waste shall be managed for all waste streams in decommissioning". ~~Paragraph 1.20. of GSR Part 6 [8] states that: "1.20. The management of fresh nuclear fuel and the management of spent nuclear fuel and of radioactive waste generated during the~~

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			decommissioning plan and should be supported by the design of the facility.					~~operational phase of a facility are not usually considered part of decommissioning. …“~~ The management of the radioactive waste generated during the decommissioning should be considered in the decommissioning plan and should be supported by the design of the facility. Recommendations on meeting these requirements are provided in Section 7.
59.	Germany-29	2.43A new para	Appropriate design targets for decommissioning facilities and for processes based on dose constraints should be derived, taking into account requirements, stated in paras 2.44 - 2.47.	Please add a new para to make it clear that design targets should be derived from dose constrain and that they should be based on corresponding requirements. **Relevance 1**	x			2.43A new para Appropriate design targets for decommissioning facilities and for processes based on dose constraints should be derived, taking into account requirements, stated in the following paras 2.44 - 2.47.
60.	Germany-30	2.45	The relevant dose limits for the exposure of workers and for the exposure of members of the public should be applied during decommissioning in accordance with GSR Part 3 [2]. In addition, it is stated in para 2.1. of GSR Part 6 [8]: “… Radiation protection of persons who are exposed as a result of decommissioning actions shall be optimized with due regard	We suggest to delete this sentence here and create para 2.43A (see comment above) to make order of statements more logical and comprehensive. **Relevance 1**	x			~~Appropriate design targets for decommissioning facilities and processes based on dose constraints should be derived. Will be a~~ New para 2.43A

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			to the relevant dose constraints." ~~Appropriate design targets for decommissioning facilities and processes based on dose constraints should be derived.~~					
61.	Germany-31	2.46	Paragraph 2.2. of GSR Part 6 [8] states that: "~~2.2.~~ In addition to provisions to protect against exposure during planned activities, provision shall be made during decommissioning for protection against, and for reduction of, exposure due to an incident. However, if the incident or the particular situation is of such a nature as to warrant remediation or to require confinement of releases of radioactive material under emergency conditions, other IAEA safety standards apply [*])" [*] GSR Part 3 [2] and GSR Part 7 [9].Corresponding design considerations are given in Paras *5.68 – 5.78* of the current Safety Guide.	Please state clearly the relation of this para to design. We made a suggestion, but please consider that our references to paras might be incomplete, please verify them. **Relevance 1**		x		…Recommendations for corresponding design considerations are given in Paras in Section 7 of the current Safety Guide. ~~Tobias:~~ ~~To check paras in Section 7~~
62.	Germany-32	2.47	Para 2.3. of GSR Part 6 [8] requests that: "~~2.3.~~ National regulations on the protection of the environment and the requirements of Ref. [*] addressing protection of the environment shall be complied with during decommissioning, and beyond if a facility is released from regulatory control with restrictions on its future use." [*] GSR Part 3 [2]. Recommendations on the design to meet ~~this requirement~~ these requirements are provided in Section 7 of this Safety Guide.	Please state clearly the relation of this para to the main topic of the current Guide, i.e. design. Additionally, this text is referring to a number of requirements, and not to a single one. **Relevance 1**	x			Same as Germant-31: …Recommendations on the design to meet ~~this requirement~~ these requirements are provided in Section 7 of this Safety Guide.

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63.	Germany-33	Chapter 3Title	3. GENERAL ASPECTS OF RADIATION PROTECTION IN the DESIGN SOURCES OF RADIATION	Please separate both titles, visually as well, to avoid reading as "GENERAL ASPECTS OF RADIATION PROTECTION IN DESIGN SOURCES OF RADIATION" **Relevance 2**		X		Formatting - Editorial
64.	Israel-3	3.1	We suggest to consider adding spent resins explicitly (separately or combined with the waste treatment systems) as one of the ten listed main sources causing radiation exposures in operational states and during decommissioning. This also in view of mentioning spent resin sources (later in the same paragraph) as an example of the largest radiation sources (together with the reactor core and irradiated fuel) – with the last two appearing also in the "list of ten".	Completeness	x			- the waste treatment systems, spent resins and storage systems;
65.	Finland-6	3.1	Proposed modification: *the reactor core, reactor internals and vessel* ***and the surrounding materials that are activated***;	For example concrete and its impurities.	x			See UK-7 the reactor core (including fuel and non-fuel components), reactor internals and vessel and the surrounding materials that are activated
66.	UK-6	3.1/8	Can the 'the waste treatment systems' wording include 'storage'	Additional wording.	x			
67.	UK-7	3.1/9	Add " and non-fuel core components"	Additional wording.		x		~~Vaughan suggested~~ It is suggested the first bullet point in 3.1 be changed from ~~the reactor core, reactor internals and vessel;~~

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								to the reactor core (including fuel and non-fuel components), reactor internals and vessel; See also Finland-6
68.	Germany-34	3.1	- The magnitudes and locations of the sources of radiation in operational states and during decommissioning should be determined in the design phase. The main sources that cause radiation exposure in operational states and during decommissioning should be taken into account, including the following: the reactor core, reactor internals and reactor vessel;the reactor coolant and moderator system;volume control and reactor water cleanup systems,the steam supply system, feedwater system and turbine generators (depending on the design);the waste treatment systems;irradiated fuel;spent fuel pool including connected cooling and cleaning systems;the fuel handling and storage system;decontamination facilities;ventilation systems and miscellaneous sources such as sealed sources that are used for non-destructive testing.	Please complete /modify the list of systems **Relevance 1**	x			the reactor core (including fuel and non-fuel components), reactor internals and vessel and the surrounding materials that are activated ; the reactor coolant and moderator system; volume control and reactor water cleanup systems,the steam supply system, feedwater system and turbine generators (depending on the design);the waste treatment systems, spent resins and storage systems;irradiated fuel;spent fuel pool including connected cooling and cleaning systems;
69.	USNRC-8	3.7	More relatedrecommendations are provided in GSG-7 [10] and SSG-40 [11], and ICRP 55.	Add red text. Section 3 of ICRP 55 “Optimization and Decision Making in Radiological Protection,” provides an approach to optimization as applied to design and decision-making techniques.	x			and ICRP 55 “Optimization and Decision Making in Radiological Protection,” [33A],.

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70.	Germany-35	3.8	In order to implement this structured approach, the design organization should have an optimization culture in which the importance of radiation protection is recognized at each stage of the design. An optimization culture is established by ensuring that all participants in a project are aware of the general requirements for ensuring radiation protection and of the direct and indirect impact of their individual activities or functions on the provision of radiation protection for site personnel, ~~and~~ members of the public and the environment.	Please put in line with SF-1 and with other paras of current document, for consistency. **Relevance 2**	x			
71.	Pakistan-1	3.12/9	Personal protective equipment may be added instead of Respiratory protection. The bullet may be rephrased as; Design measures to minimize the use of **personal protective equipment**	**'personal protective equipment'** is broad term that also includes Respiratory protection along with others (e.g. lead aprons, lead goggles, lead gloves etc.) Further, GSR Part-3, Section 3.93 requires that "Employers, registrants and licensees shall minimize the need to rely on administrative controls and personal protective equipment for protection and safety by providing well engineered controls.	x			Design measures to minimize the use of ~~respiratory protection~~ personal protective equipment;
72.	Russia/ROSATOM-5	3.12/10	- Checklists for use by engineers that can be reviewed by radiation protection specialists (an example checklist for radiation protection optimization in NPP designing is given in ref. [Occupational Radiological Protection Principles and Criteria for Designing New Nuclear Power Plants. OECD NEA report No. 6975, 2010; Appendix 1])	Inclusion of reference to a well-developed and detailed example of checklist for radiation protection optimization in NPP designing would increase usefulness of the DS524.		x		Footnote An example checklist for radiation protection optimization in NPP designing is given in ref. [Occupational Radiological Protection Principles and Criteria for Designing New Nuclear Power Plants.

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								OECD NEA report No. 6975, 2010; Appendix 1])
73.	Germany-36	3.12	The requirement to achieve an adequate level of radiation protection affects a wide range of issues associated with the design. It is necessary therefore to ensure that for all design related decisions that may affect exposures the recommendations of radiation protection specialists have been recorded. However, the design process should be planned so that the implementation of these recommendations is feasible ~~not on the critical path.~~	Wording for clarification **Relevance 2**	A			
74.	Israel-4	3.13	The last two bullets in that paragraph, regarding decisions that have to be reviewed by radiation protection specialists and the disputes resolving forum: In order to prevent ambiguous situations (as to whether a specific decision may have a major influence on exposures and therefore necessitates review or involvement of the radiation specialists) we suggest to add to the last bullet a few words about the necessity of an appropriate continuous information sharing mechanism between the design engineers and the radiation protection specialists.	Clarity	x			"There should be an appropriate continuous forum for proposing improvements and resolving disputes that may occur between design engineers and radiation protection specialists."
75.	Germany-37	3.14	A systematic and structured management system programme should be applied in the entire design process as recommended by ~~DS513 revision of~~ GS-G-3.1 [34].	A Reference to a draft Safety Guide might be not appropriate. If DS513 is not published before DS524, it might be better to refer to GS-G-3.1, where the statement is also mentioned.			x	To keep DS513 until the Step 12

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				Relevance 2				
76.	Germany-38	3.15	A strong management commitment should be made to ensure that an optimization procedure in the organization is effective. In some organizations, this commitment includes the appointment of a manager for optimization who is directly responsible to the senior manager of the design project and thereby is involved in the decision making process.	Please specify, optimisation procedure of what is meant in this statement. **Relevance 2**		x		to ensure that ~~an~~ the optimization process ~~procedure~~ in the operating organization is effective. See also Appendix and GSG-7 (2.9,-10, 3.8-3.33)
77.	Belarus-1	3.16 p. 28 and throughout the whole document	3.16. Design targets should be set at the start of the design process, and should include dose constrains of population and workers: - annual effective and equivalent doses for site personnel; - annual effective doses of public that assessed for representative person. Throughout the whole the draft the collective dose assessment shall be	In accordance with GSR Part 3 and ICRP publication 103 collective dose should not been use in the radiation safety. Dose constrains of public and workers shall be applied for the radiation safety issues. Dose assessment for the purposes of radiation safety have to be performed for a representative person and these requirements are established by the relevant IAEA requirements. References and abstracts on the IAEA requirements are given in the General section at the beginning of this Draft. For example: p. 10 the para 2.3. Requirements 5 of SSR-2/1 (Rev. 1) and para 2.4 Requirement 81 “Design for radiation protection” of SSR-2/1 (Rev. 1). In accordance with para IAEA Safety Glossary, GSR Part 3 and		x		“Design targets should be set at the start of the design process, and should include dose constrains of population and workers: “ The para is in line with GSR Part 3.

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				GSG-9 the authorized annual dose constraints for members of the public is applicable to the representative person of the public that is an individual receiving a dose that is representative of the doses to the more highly exposed individuals in the public. (see para 2.26 at the draft). There are contradictions between the requirements of this draft and the GSR-3 and IAEA requirements, links to which are indicated at the beginning of the draft. Throughout the document it is necessary to check the feasibility of introducing the requirement to assess the collective dose for the purposes of assessing the radiation protection of the public and workers. If in some cases the collective dose assessment is justified, then it is necessary to add some paras to explain these cases and the purpose of the collective dose assessment on the design stage, for example, to assess the financial costs of radiation protection, etc.				
78.	Belarus-2	3.16	It is important to clarify some terminology used in the Draft: workers and personnel.	As a general the IAEA requirements the term worker	x			Editorial Consistency of terminologies used in

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		p. 28 and Fig.1 and throughout the whole paragraphs on workers protection		have been used. But in the text both terms are used (worker and personnel). It is necessary to clarify, what differences are between workers and personnel in accordance with the IAEA requirements and the Glossary.				the draft will be checked again during the editorial review.
79.	Russia/ROSATOM-6	3.16	It is reasonable to establish specific dose targets	To change the wording: «**may be established**» to «**it is reasonable to**…»	x			It is reasonable to establish specific dose targets ~~Specific dose targets may be established~~ for operations carried out when the reactor is in operation and for operations carried out during outages.
80.	Belarus-3	p. 28 FIG. 1. Strategy for the optimization of radiation protection in the design of a nuclear facility	To change bullet «assessment collective and individual doses» on the «dose assessment of public and workers»	The collective doses shall not be applied for radiation safety accordance with GSR-3 and ICRP publication 103. Collective doses can be used only for benefit assessment and epidemiological studies.	x			The figure will be modified GSR-Part 3
81.	Indonesia-1	Fig.2	As attached below	Fig. 2 need to be revised to show the flow of the necessary steps to be taken		x		The proposed figure will be modified

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82.	Marocco-5	3.17	In providing the best practicable means for reducing releases, the implications for the exposures of site personnel should be taken into account to ensure that there is no undue increase. Other measures should be considered to optimize site personnel exposure.	If the increase of site personnel's exposure is unavoidable, measures ensuring the optimization of their exposure are mandatory, and measures should be considered.		x		no ~~undue~~ increase No unjustified increase
83.	UK-8	3.20	Add new item (8): 'Proper consideration of the hierarchy of preventative measures should be made. Elimination of the hazard is the best solution, followed by reducing the hazard if elimination is not possible. The next step is to isolate the hazard and to use engineered controls to reduce the risk to workers, with administrative controls and personal protective equipment at the bottom of the hierarchy.'	Even where NPP are a well-established technology, the hierarchy of preventative measures can be forgotten or missed, so it is vital to explicitly describe them to remind designers and others of their importance. "hierarchy of preventative measures" is the term used in GSR part 3.	x			After Fig. 3
84.	Finland-7	3.20	Proposed modification:(4)*Types of workers included maintenance personnel, in-service inspection personnel, support staff (e.g. scaffolders, **insulation worker**), decontamination staff and health physics staff.*	In annual maintenance of Loviisa Power Plant, one of the employee groups to receive the highest doses is insulation workers.	x			(e. g. scaffolders, insulation worker)
85.	Germany-39	3.20	The following procedure should be adopted for developing the design to ensure the radiation protection of site personnel: (1) The ~~general requirements~~ basic principles for the plant design should be developed and documented. These should include the principles on which the layout of the plant will be based and restrictions on the use of specific materials in the design of the plant. These documents form part of the	Clarification **Relevance 2**		X		The general requirements for the plant design should be developed and documented.

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			management system for the design (see GS-G-3.5 [35]).					
86.	Germany-40	3.20 (2)Line 2	… For example, in many reactor designs, two areas in which there is a major potential for reducing exposures are ~~scheduled and unscheduled~~ preventive and corrective maintenance.	"Scheduled and unscheduled maintenance" seem to be outdated terms. Suggested designations are more common and should cover all relevant forms of maintenance as well. **Relevance 2**		x		Maintenance activities
87.	UK-9	3.22	Change the opening of the sentence to 'For plant designs, such as pressurized heavy water reactors, where an important contributor to exposures is the inhalation of airborne radionuclides…	Airborne contamination is not restricted to heavy water plants, nor to tritium.		X		~~In pressurized heavy water reactors, for which a~~ An important contributor to exposures is the inhalation of airborne contamination such as tritium in pressurized heavy water reactors, for plant designs a logical layout of the plant should be developed that is divided into zones on the basis of levels of airborne radionuclides.
88.	Russia/ROSATOM-7	3.24	A preliminary decommissioning plan should be developed to ensure that the design includes the necessary features to reduce and control exposures during decommissioning. In many cases, these features are the same as those necessary for operational states, but some additional special features maybe necessary for decommissioning. If these are major, the necessary features for operational states and those for decommissioning should be optimized. **Comprehensive engineering**	It is proposed to add an additional sentence.		x		More recommendations for radiation protection design aspects provided in Section 7.

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			and radiological examination of the NPP (the NPP power unit or any other nuclear facility located at the NPP site) shall be performed prior to decommissioning. The decommissioning program for the NPP (the NPP power unit or any other nuclear facilities located at the NPP site) shall be updated subsequent to this comprehensive NPP examination					
89.	UK-10	3.25	Add at the end of the sentence '… all of the following measures *utilising the hierarchy of preventative measures*:'	Further reminder of hierarchy of preventative measures.	x			… by adopting some or all of the following measures utilising the hierarchy of preventative measures in accordance with para 3.93 of Ref. GSR Part 3 [3]:
90.	Germany-41	3.25New issue	The design should be such as to facilitate achievement of the targets for occupational doses — both individual doses and collective doses — by adopting some or all of the following measures:(1) Reduction of dose rates in working areas by: …(2) Reduction of occupancy times in radiation fields by: — Specifying high standards of equipment to ensure very low failure rates; — Ensuring ease of maintenance and removal of equipment; — Removing the necessity for some operational tasks by, for example, providing built-in auxiliary equipment and making provision in the design for permanent access; — Ensuring ease of access and good lighting; — Optimizing the number of workers and their time in the radiation field by design	Please add an issue on application of remote or automated inspection devices for the purposes of reduction of occupancy times in radiation fields. **Relevance 1**	x			

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			means.— Making provisions for remote or automated inspection devices					
91.	Marocco-6	3.25	The following bullets should be placed in the first measures: (1) Reduction of dose rates in working areas by: • Specifying high standards of equipment to ensure very low failure rates. • Ensuring ease of maintenance and removal of equipment;	These elements are technical, not occupation lime related. It is suggested to place them in the section before.			x	These elements are technical, but more occupation lime related, not source related. Occupancy – exposure
92.	UK-11	3.27	This paragraph should include reference to direct radiation exposures as well as exposures resulting from discharges.	NPP may have facilities, such as waste and spent fuel, located near the site boundary.	x			Last sentence of the first bullet, skyshine
93.	Japan-2	3.28	Provision should be taken ~~Activity monitors should be installed at the gates~~ to ensure that no radionuclides leave or unintentionally enter the plant, such as activity monitors at the gates.	Activity monitoring at gate is one of means to ensure that no radionuclides leave or unintentionally enter the plant can be properly monitored, and then discerption is modified as one example.		X		Provision should be taken ~~Activity monitors should be installed at the gates~~ to ensure that no radionuclides leave or unintentionally enter the plant, such as activity monitors at the gates.
94.	Finland-8	3.28	All potential effluent pathways should be monitored. Activity monitors should also be installed at the gates to ensure that no radionuclides leave or unintentionally enter the plant.	An additional statement to stress the importance that already in design stage all potential effluent pathways are taken in consideration.Also taking into account radiation monitoring of transport vehicles.	x			
95.	Finland-9	3.28	Proposed modification: *Activity monitors should be installed at the gates to ensure no **unintentional** radionuclides leave or enter the plant.*	The requirement *Activity monitors should be installed at the gates to ensure that no radionuclides leave or unintentionally enter the plant* is impossible to fulfill as it is currently stated in the standard		X		Japon-2

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				draft. The acceptance limit/value can not be zero. There should be addition description that acceptance limits are established by the government or the regulatory body. Also the requirement should specify whether it is a gate of a controlled area or a gate of a power plant area. In addition, it should be considered whether the requirements fall within the scope of security arrangements than the design for radiation protection for members of the public.				
96.	UK-12	3.28/A	The maximum radionuclide concentrations that may be present in relevant local flora and local and migratory fauna, as well as the internal dose that may result from those concentrations, should be assessed through considerations of the exposure pathways for non-human biota. ~~The radiological acceptance criteria established for humans are generally conservative with regard to the protection of other species and, from the radiological point of view, the protection of non-human biota is generally achieved by protecting the human population (see para. 1.33. of GSR Part 3 [2]).~~ Further recommendations on the protection of non-human biota are provided in GSG-8 [25], GSG-9 [23] and GSG-10 [20]. Suggested replacement for the highlighted text is as follows based on GSR Part 3:	The highlighted text inaccurately paraphrases the GSR Part 3 guidance, the key point of which is that assessment of impact on humans is no longer considered to be adequate to protect wildlife. Also, the statement is not in line with that of the ICRP which around the year 2000 changed its stance to note that protection of humans was no longer considered to be a demonstration that the environment was protected. Alternative text provided as shown.		x		The radiological acceptance criteria established for humans are generally conservative with regard to the protection of other species and, from the radiological point of view, the protection of non-human biota and the environment is generally achieved by protecting the human population (see para. 1.33. of GSR Part 3 [2]). If there is a need to be able to demonstrate that the environment is being protected against effects of radionuclides, the environmental assessment should cover that. (See para 3.29.)

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			There is a need to be able to demonstrate (rather than to assume) that the environment is being protected against effects of industrial pollutants, including radionuclides, in a wider range of environmental situations, irrespective of any human connection.					
97.	Germany-42	3.29	A radiological environmental impact assessment should be carried out in accordance with ~~NS-G-3.2 [19] and~~ GSG-10 [20] and Sections 4, 5 and 6 of NS-G-3.2 [19] to inform the optimization process being applied to doses to members of the public and to ensure that the design complies with national regulatory requirements and appropriate dose targets.	GSG-10 superseded a number of sections of NSG-3.2, so only Sections 4, 5 and 6 of NS-G-3.2 are therefore relevant. **Relevance 1**	x			
98.	Germany-43	3.33	Measures provided in the design for emergency arrangements and for radiation protection should be appropriate for maintaining safety in the event of an accident; mitigating the consequences of accidents if they do occur; protecting site personnel and the public; protecting the environment in accordance with para 5.2 of SSR-2/2 (Rev. 1) [3]. ~~Appropriate arrangements should be established before the nuclear fuel is first brought into the site and crosses the plant fences. The emergency plan and all emergency arrangements should be completed before the commencement of fuel loading~~	We suggest to delete part of the statement, which is not related to design. **Relevance 1**		x		~~Appropriate arrangements should be established before the nuclear fuel is first brought into the site and crosses the plant fences.~~ The emergency plan and all emergency arrangements should be completed before the commencement of fuel loading. This sentence is highlights the importance of the EP
99.	Finland-10	3.34	The feedback and experience from emergency situations should be used to identify the good practises as well.	Radiation protection during emergencies is dependent on the chosen design.	x			Add to the end: The feedback and experience from emergency situations

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								should be used to identify the good practises as well.
100.	UK-13	3.35	Add at the end of the paragraph "… noting the different risk profile during commissioning."	Whilst the inventory and power levels will be lower, this is the first time the reactor has been taken critical.	x			Changed para number from 3.35. to new number 3.36{Germany-44}
101.	Germany-44	3.35-3.50	~~Design Considerations for Commissioning and OperationCommissioningOutagesDesign considerations for initial start-upDesign considerations for start-up and shut down~~ Design Considerations for Commissioning • Early Commissioning • Initial start-up Design Considerations for Operation • Start-up and shutdown • Outages, or • Design Considerations for Commissioning and Operation • Early Commissioning • Initial start-upStart-up and shutdown Outages	The subdivision of the section "Design considerations for commissioning and operation" seems to be somewhat confused. We suggest splitting it into two parts or at least changing the order and adapting the naming. **Relevance 1**		X		Design Considerations for Commissioning • Early Commissioning • Initial start-up Design Considerations for Operation One sentence was added after the title **"Design consideration for Operation"** to refer to Section 5 "Section 5 in this Safety Guide provides recommendations for radiation protection design aspects for plant operation in details." • Start-up and shutdown • Outages (3.45-3.47 was moved before 3.38) ~~(David)~~ Add to the beginning of 3.38: " In the context of this guide, "outage" means the periods of normal

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								operation during conditions when the reactor is shutdown for maintenance, testing or refueling.”
102.	Germany-45	3.35	The measures included in the design to provide an optimized level of radiation protection for operational states should be adequate for addressing the requirements for the commissioning phase, see Requirement 6 of SSR-2/1 (Rev. 1) [1] and SSG-28 [44], Commissioning for Nuclear Power Plants, even if in the commissioning phase the radiation levels are generally lower because of the lower power levels and the low buildup of radioactive material in the plant’s components).	Clarification **Relevance 2**	x			see Requirement 6 of SSR-2/1 (Rev. 1) [1] and recommendations () (Tobias) SSG-28 [44], Commissioning for Nuclear Power Plants, even if in the commissioning phase the Changed para number from 3.35. to new number 3.36{Germany-44}
103.	Germany-46	3.36	Measures should be taken during the early commissioning phase to identify any design deficiencies, such as the shielding being inadequate to prevent radiation streaming, so that these can be rectified before the reactor reaches full power operation.	Clarification. Please check the possibility to include “radiation streaming” into the Safety Glossary, as this term is not defined there. **Relevance 1**	x			“to prevent radiation streaming” Moved para 3.36. new number is 3.35. {See Germany-44}
104.	Russia/ROSATOM-8	3.37	Test programs to verify the adequacy of shielding should be developed during the design phase. Further recommendations about the commissioning program are provided in SSG-28 [44].A program and system to monitor integrity of the physical barriers on the paths of ionizing radiation and radioactive substance releases into the environment shall be provided for control of compliance with the specified safe NPP operation limits**.**	It is proposed to add an additional sentence.		X		3.37. Test programs to verify the adequacy of shielding and engineered features designed to protect workers from radiological exposure (e.g., monitoring and verifying the integrity of the physical barriers on the paths of ionizing radiation and radioactive substance

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
								releases into the environment) should be developed during the design phase and performed during commissioning should be provided for control of compliance with the specified safe NPP operation limits. Further recommendations about the commissioning programme are provided in SSG-28 [44].
105.	USNRC-9	3.37	Test programs to verify the adequacy of shielding should be developed during the design phase. Further recommendations about the commissioning programme are provided in SSG-28 [44]	This point should be made in section 3.20 or 3.25(1) where the design phase is discussed.		x		~~David:~~ Testing for shielding is more clearly covered in the Sections 5 and 7 dealing with design for commissioning See resolution of Russia/ROSATOM-8 comment
106.	UK-14	3.37	Add, after shielding "… and engineered features designed to protect workers from radiological exposure".	Shielding is not the only thing to protect workers.	x			See resolution of Russia/ROSATOM-8 comment
107.	Germany-47	3.37	Test programs to verify the adequacy of shielding should be developed during the design phase. ~~Further recommendations about the commissioning programme are provided in SSG-28 [44].~~	Statement about further recommendations is related not only to test programs, but to current subject in general. We suggest to move the issue to para. 3.35. **Relevance 2**		x		See resolution of Russia/ROSATOM-8 comment 3.35 refers to SSG 28

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108.	Marocco-7	3.37	Test programs to verify the adequacy of shielding should he developed during the design phase and performed during commissioning. Further recommendations about the commissioning programme are provided m SSG-28 (44).	The tests must be carried out in the design phase and maintained during commissioning in accordance with the SSG-28 mentioned in the following paragraph.			x	See resolution of Russia/ROSATOM-8comment
109.	Finland-11	3.39	*Provisions for platforms required for safe work should be included in the design as well as storage of scaffolding and temporary shielding materials inside ~~the containment~~ the controlled area (RCA).*	Extra material inside the containment should be avoided.	x			
110.	Germany-48	3.40	Temporary shielding provisions ~~such as structural support or supporting system design features~~ should be considered for outage and maintenance work on primary system components which cannot be shielded permanently.	Please simplify **Relevance 1**		x		Temporary shielding provisions ~~such as structural support~~ or supporting system design features should be considered for outage and maintenance work on primary system components which cannot be shielded permanently.
111.	Japan-3	3.41	Fuel pools and fuel transfer canals design should assure shielding and easy decontamination of the pools and fuel transfer canals, particularly if this is required for inspection or maintenance of fuel transfer equipment. Design of filtering and cleaning systems should take into account the need to achieve doses that are optimized during maintenance. ~~Specific shielding should be considered in the design for the optimization of the dose rate in the peripheral area of the reactor building during fuel transfer from the reactor building to the spent fuel pool.~~	In the design of spent fuel pools and fuel transfer canals, "shielding" should be the first priority. Therefore, it should be explained at the beginning of this para. Then, the third sentence is duplication.	x			

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112.	Finland-12	3.41	*Specific shielding should be considered in the design for the optimization of the dose rate in the peripheral area of the reactor building during fuel transfer from the reactor building tothe spent fuel pool.*	This do not apply for all reactor types. Please indicate the type of the reactor as an example.		X		Deleted See Japan-3 comment
113.	Germany-49	3.41 Line 4	… Specific shielding should be considered in the design for the optimization of the dose rate in the peripheral area of the reactor building during fuel transfer from the reactor building to the spent fuel pool, as far as applicable.	This requirement depends on design: if the spent fuel pool is in the same building as reactor or not. **Relevance 2**		X		Deleted See Japan-3 comment
114.	Finland-13	3.43	Proposed modification: *Contamination monitors should be considered in exit control logistic ~~during outages, periods having increased staffing~~.*	Please clarify. Is the purpose to indicate that outages should be considered when planning the capacity of the monitoring? Contamination shall be continually monitored at exit points, not only during outages.		x		See Finland-14
115.	Finland-14	3.43	Could you clarify what is monitored and registered during accessing the controlled area?	Please clarify. It is unclear whether contamination measurement or something else are meant here.		x		Additional ~~C~~contamination monitors should also be considered in exit control logistics during outages, periods ~~having increased staffing~~.
116.	UK-15	3.43/3	Change '~~equipment's~~' to 'equipment'	Typo.	x			
117.	Germany-50	3.43	Provisions should be considered in the design ~~for~~ of efficient access and exit control points and related facilities, such as monitoring and registration of personnel accessing the plant-controlled area with personnel protective equipment~~'s~~. Contamination monitors should also be	Clarification **Relevance 2**	x			

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			considered in exit control logistics during outages, periods, having increased staffing.					
118.	Japan-4	3.44	Where possible, flanged connections should be provided on liquid systems for quick disconnections and access for ~~hydrolysing~~ clean-up.	"Hydrolysing" should be changed to the more general term "clean-up".	x			Where possible, flanged connections should be provided on liquid systems for quick disconnections and access for ~~hydrolysing~~ clean-up, noting flanges may increase the risk of leakages of active fluid.
119.	Finland-15	3,44	*Where possible, flanged connections should be provided on liquid systems for quick disconnections and access for hydrolysing.*	Please check the use of the word "hydrolysing".	x			
120.	UK-16	3,44	Add, at the end of the first sentence "… , noting flanges may increase the risk of leakages of active fluid."	Flanges are a weak point in a pressurised system.	x			See Japan-4
121.	Marocco-8	3.44	Ensure valves located inside high radiation areas have sufficient space for maintenance, e.g.. to receive temporary shielding, etc.	It is suggested to develop further and give some examples.	x			
122.	Germany-51	3.45	Radiation protection infrastructure should be designed and be available sufficiently before the planned introduction of radioactive sources or fuel in order to fully establish the radiation protection programme and to ensure that all radiation monitoring equipment is tested and functioning correctly, as recommended in paras 3.33, 3.48, 3.61, 4.28, A-2, A-3 and A-14 of SSG-28 [44].	Please make a clear relation of statement in this para to the subject of current subsection "Design considerations for initial start-up" **Relevance 1**	x			Para number 3.45 was changed to new para number: 3.38. See Germany-44

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123.	Germany-52	3.46	Chemistry parameters for initial start-up should be specified in the design, with radiation protection considerations included in the optimisation process, as this can have a significant effect on reactor source term later in operation. ~~(See para. 5.19. of SSG-13 [46]).~~	Please make a clear relation of statement in this para to the subject of design. Please delete here reference to para. 5.19 of SSG-13 [46], as this para is about preconditioning of the surfaces. **Relevance 1**	x			Para number 3.46 was changed to new para number: 3.39. See Germany-44 Chemistry parameters for initial start-up and continued operation See notes in the resolution of Germany-44
124.	USNRC-10	3.47	During the commissioning phase, surfaces should be preconditioned before and during initial start-up in order to produce a protective layer and to ensure appropriate, passivated surfaces in all systems. To minimize operational source term, controls should be put in place to ensure that appropriate water chemistry is always maintained during operation. The protective layer will reduce the subsequent release of corrosion products into the coolant when the plant is at power and hence will reduce the deposition of radioactive material.	Recommend adding this point to emphasize the importance of maintaining water chemistry to minimize source term		x		Para number 3.47 was changed to new para number: 3.40. See Germany-44 Instead of changing para 3.47 (now 3.40), change the beginning of 3.46 (now 3.39) to read "Chemistry parameters for initial start-up and continued operation See notes in the resolution of Germany-44
125.	Germany-53	3.47	~~During the commissioning phase, s~~Surfaces, which should be preconditioned before and during initial start-up in order to produce a protective layer and to ensure appropriate, passivated surfaces in all systems~~.~~, should be specified in the design. The protective layer will reduce the subsequent release of corrosion products into the coolant when the plant is at power and hence will reduce the deposition of radioactive material (see para. 5.19. of SSG-13 [46]).	Please make a clear relation of statement in this para to the subject of design, as this is not obvious. Please include here reference to para. 5.19 of SSG-13 [46], as relevant one. **Relevance 1**		x		

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126.	Finland-16	3.49	*Consideration should be given to increasing the capacity of the reactor water cleanup system specifically for shutdown, to minimize activated corrosion products in the reactor coolant.*	Please add terms reactor water for clarity.	x			*Consideration should be given to increasing the capacity of the reactor coolant cleanup system specifically for shutdown, to minimize activated corrosion products in the reactor coolant.*
127.	Germany-54	3.55	To achieve the proper design of plant systems and components for radiation protection under accident conditions experts in radiation protection, plant operations, plant design and accident analysis, and experts in regulatory matters should be involved in all stages of design process.	Clarification, otherwise text is misleading **Relevance 2**	x			
128.	UK-17	3.63	Not clear which section should be referenced as section 7 is about decommissioning.	Error in section reference.	A			Section 8
129.	India-2	Title Page 39	ESTIMATING RADIATION DOSE RATES DURING NORMAL ~~PLANT~~ OPERATION AND DECOMMISSIONING	As per the IAEA Glossary there is no term such as "plant operation". However, the term used in IAEA glossary are "Plant States and Normal Operation". Hence, the suggestion. Further, the term "Plant Operation" has also been used at several other places such as title on page 59 and para 8.6 on page 86 in this document, which may be suitably reviewed and changed accordingly in line with IAEA Glossary.		x		Editorial In Section 4 (page 43 To check all terms though the document ROSATOM-1 comment

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
130.	Germany-55	4.2	During the design phase, the requirement to provide equipment to assess internal exposures should be considered. The basis for this are estimations of radiation doses during operation and decommissioning, recommendations for which are provided in this section. ~~Recommendations on estimating radiation doses during operation and decommissioning are provided in this section~~ Such recommendations are given in accordance with the scope of this Safety Guide which is to outline the methods ~~that are~~ used to calculate on-site and off-site radiation levels and to verify that the design provides an adequate level of radiation protection. No recommendations are provided on calculational methods or values of the parameters to be used to evaluate the radiation dose rates expected to occur during operation and decommissioning. Other recommendations about occupational radiation protection considering external exposure and internal exposure as well as skin and lens contamination are provided in GSG-7 [10].	Please state clearly the relation between design, equipment and calculation at the beginning of this section (see also comment to para. 4.4). Please make relevance to the Scope more precise and understandable. **Relevance 1**	x			GSR-3 Requirement 14 During the design phase, need of an equipment to assess ~~internal~~ exposures should be considered. The bases for this are estimations of radiation doses during operation and decommissioning, recommendations for which are provided in this section. ~~Recommendations on estimating radiation doses during operation and decommissioning are provided in this section~~ Such recommendations are given in accordance with the scope of this Safety Guide which is to outline the methods ~~that are~~ used to calculate on-site and off-site radiation levels and to verify that the design provides an adequate level of radiation protection. No recommendations are provided on calculation~~al~~ methods or values of the parameters to be used to evaluate the radiation dose rates expected to occur during operation and decommissioning. Other

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
								recommendations about occupational radiation protection considering external exposure and internal exposure as well as skin and lens contamination are provided in GSG-7 [10].
131.	Germany-56	4.4	~~During the design phase, the requirement to provide equipment to assess internal exposures should be considered.~~ The calculation of internal exposure of workers is based on the duration of exposure at the workplace, the atmospheric activity, including activity coming from surface activity of the deposit (use of resuspension factor), the radionuclides involved, the particle size distribution, the breathing rate and dose coefficients factors. Recommendations on the assessment of internal exposure are provided in paras 7.133–7.227 of GSG-7 [10].	Please put this sentence on the beginning of the section to state clear the relation between design, equipment and calculation. **Relevance 2**		x		See Germany-55 Better to keep here as well During the design phase, the requirement to provide equipment to assess internal exposures should be considered as well.
132.	Germany-57	4.6	The sources may be grouped into five categories that affect potential exposure in different ways, and these different ways should be considered in design. ~~which should thus be taken into account in different ways in the design.~~	Clarification **Relevance 2**	x			See Russia/SECNRS-1
133.	Russia/ SECNRS-1	4.6	Add new item The sources may be grouped into five categories that affect potential exposure in different ways, and which should thus be taken into account in different ways in the design. In general terms, these are:…f) Those sources that are important contributors to doses to	Para 4.6 contains a list of sources categories, which affect potential exposure in different ways and which should be taken into account in the design. One more category could be included in this list.	x			The sources may be grouped into ~~five~~ categories that affect potential exposure in different ways, and these different ways should be considered. ~~which should thus be taken into account in~~

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			members of the public during plant decommissioning.					~~different ways~~ in the design. In general terms, these are:… f) Those sources that are important contributors to doses to members of the public during plant decommissioning.
134.	Germany-58	4.8	… The neutron and gamma emission rate and neutron and gamma flux distributions that are calculated for the core are used as input data for computer calculations to determine the neutron and gamma flux energy and spatial distributions through the coolant and through the structural and shielding materials surrounding the core to determine corresponding design criteria.	Clarification **Relevance 2**	x			
135.	Germany-59	4.10	Depending upon the design, many of the components within the reactor vessel are regularly removed and become sources in locations outside the vessel. These include the ~~spent~~ fuel elements, control rods, neutron sources, in-core ~~instruments~~ instrumentation and the internals of the reactor	Spent fuel does not belong to components, “fuel elements” is a better term here. **Relevance 1**	x			
136.	Germany-60	4.11	The source terms for all these components that are used in ~~for~~ the design of the shielding should be based on the maximum ~~activities~~ radioactive releases that could occur over the lifetime of the plant. This is likely to be for the maximum rated fuel assembly and at the end of life ~~activity~~ for the other components.	Clarification. **Relevance 2**			x	“Radioactive releases” is not an appropriate term as this paragraph mainly concerns intact fuel and systems and components contaminated with corrosion products.
137.	Germany-61	4.18	… Where appropriate, concrete inside of radiologically controlled areas should be	Clarification.		x		… Where appropriate, concrete inside of radiologically controlled

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		Line 2	coated before ~~sealed during~~ plant operation to facilitate cleaning and decontamination.	**Relevance 2**				areas should be coated before ~~sealed during~~ plant operation to facilitate cleaning and decontamination providing that the concrete parts are accessible for cleaning or for decontamination .
138.	Finland-17	4.19	*Considering possible defects in the fuel cladding, the primary and auxiliary circuits may becontaminated by alpha emitters.*	Please add the term fuel for clarity.	x			
139.	Finland-18	4.20, 4.21	The requirement should be specified whether it is a hot spot or discrete radioactive particle / hot particle.	Please clarify:A hot spot and a discrete radioactive particle / hot particle are two different things.The definitions should be added in this context.	x			See Germany-62
140.	Russia/ROSATOM-9	4.20	Foreign objects left in the primary circuit or other circuits connected to it;	It is proposed to change «debrits» to «foreign object» as different items can be discovered.		x		See Germany-62 Foreign material rather than foreign objects.
141.	Germany-62	4.20	A special hazard during operational states and decommissioning can be what are generally designated as 'hot spots' in terms of temperature and dose rate. Hot spots result from the activation of small objects present in the coolant. These objects may be: — Particles of metal resulting from ~~unusual~~ excessive wear of components and/or fuel assemblies; — Debris left in the primary circuit or other circuits connected to it; — Pieces of thick deposits on the fuel.	Term "hot spot" is not an official term in the Safety Glossary and is not that widely used by NUSSC. But, as this term is a common one for RASSC and WASSC, we would like to suggest the following:Please make an additional explanation to "hot spots", similar to SSG-10, para. 4.14;Please check the possibility to include the term "hot spots" into the Safety Glossary.Additionally, we suggest		x		A special hazard during operational states and decommissioning can be what are generally designated as 'hot spots' in terms of dose rate. In this context "hot spots" result from the activation of small objects present in the coolant. These objects may be: — Particles of metal resulting from ~~unusual~~ excessive wear of components and/or fuel assemblies; —

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				to change “unusual wear” into “excessive wear”. **Relevance 1**				Debris left in the primary circuit or other circuits connected to it; — Pieces of ~~thick~~ crud deposits on the fuel.
142.	Finland-19	4,23	Could you specify the radionuclides which are important contributors to doses to members of the public during decommissioning period?	E.g. corrosion products and activation products from surrounding materials around the reactor core. During decommissioning the radionuclide distribution in the expected environmental releases is different from normal operation releases and potential accident releases. This also affects the preparation to mitigate the environmental releases during decommission.		x		“~~as well during decommissioning~~” to delete. To include at the end of the para 4.23. During decommissioning the radionuclide distribution in the expected environmental releases is different from normal operation releases and potential accident releases. . (E.g. activation products in materials surrounding the core) This also affects the preparation to mitigate the environmental releases during decommission. See Ref. SSG-47 [54].
143.	Finland-20	4.23	Could you add the activation products in materials surrounding the core (especially during decommissioning)?		x			See Finland 19
144.	Israel-5	4.25	Protection from radiation of ***site personnel*** is mentioned in this paragraph. However, this paragraph (together with paragraphs 4.22-4.24) are under the heading: *Sources that are important contributors to doses to members of* ***the public***, so probably the **site**	Clarity and Completeness	x			See USNRC-11

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			personnel mentioning should be rephrased or moved to a different pard of section 4.					
145.	USNRC-11	4.25	Consideration should be given to the design features for protecting site personnel from the radiation that results in operational states and during the decommissioning of a nuclear power plant, and the means of implementing the system of dose limitation as described in the SCHEDULE III of GSR Part 3 [2] and in GSG-7 [10]. Recommendations given in SSG-47 [54] about the implementation of the system of dose limitation should also be taken into account during design	Recommend moving this paragraph to the section entitled "Special hazards during operational states and decommissioning." The paragraph is currently in a section that deals with important contributors to doses to members of the public; however this paragraph is about protecting site personnel.	x			To move after 4.21.
146.	Israel-6	5.1	This paragraph quotes paragraph 6.75 SSR-2/1 (Requirement 81): **Plant equipment subject to frequent maintenance or manual operation shall be located in areas of low dose rate**. We suggest to consider to add in the present guide (maybe as a footnote): as far as practicable.	Completeness		x		This para provides quotation frm SSR 2/1 (Rev.1) Section 5 contains in several recommendations in appropriate places explanation "as far as practicable".
147.	UK-18	5.3	Add at the end of the paragraph "Training facilities which include realistic mock-ups of important plant features should be considered during the design phase."	Training in non-active areas reduces time in active areas and thus reduces exposures.	x			
148.	Israel-7	5.4	Regarding the minimum practicable access and exit points for controlled areas in paragraph 5.4, we suggest to consider to add (maybe as a footnote): **Assuring existence of sufficient exit points for the personnel in case of emergency**	Clarity and Completeness	x			

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149.	Marocco-9	5.4	5.4. The requirements for the classification of areas as controlled areas and supervised areas are established in Requirement 24 of GSR Part 3 [2]. Each controlled area should have the minimum practicable number of entrance and exit points for personnel, and for materials and equipment.	It is recommended to use .same terminology as in GSR part 3 (5.90.(g))	x			
150.	Marocco-10	5.5	Provision should be made for controlling accesses to and exit(s) from the controlled areas and for monitoring persons and equipment leaving the controlled areas. Exit doors should have an interlock with the contamination monitors to avoid uncontrolled exit of contaminated persons or equipment. In addition, means for disabling the interlock during the evacuation should also be provided.	It is recommended to add requirement 3.90.(g). (iii) of GSR part 3 regarding Washing or showering facilities and other personal decontamination Facilities at the exit of controlled areas:		X		To put in section 5.9 Washing or showering facilities and other personal decontamination Facilities at the exit of controlled areas:
151.	Finland-21	5.5		Please consider adding text about minimizing the background radiation levels in those rooms or areas where contamination monitoring is meant to be done.		x		Recommendation based on the Finland-21 comment on para 5.5: New sentence to the end of Para 8.27: "Background radiation levels in the rooms and areas where contamination monitoring is planned should be minimized or at least considered for decrease the uncertainty of the measurements. (See Ref. para 9.30 of GSG-7[10])"

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
152.	Russia/ROSATOM-10	5.9	Within the controlled access area, **sanitary locks** should be provided at selected places	It is proposed to change «changing rooms» to « sanitary locks» in the text everywhere.			x	The term "changing rooms" is more generally understood and used in the NS-G-1.13
153.	Germany-63	5.9	Within the controlled area, changing areas should be provided at selected places to prevent the spread of contamination during normal operation, including maintenance. ~~The facilities~~ Changing areas ~~included in these areas~~ should correspond to the requirements for access to the potentially more contaminated ~~of the two~~ area~~s~~ and its anticipated contamination levels.	It is difficult to understand clearly which "two areas" are meant; we made a suggestion for clarification. **Relevance 2**		X		The text has been clarified whilst retaining the originally intended meaning. Within the controlled area, changing areas should be provided where access to areas of higher contamination is required ~~at selected places~~ to prevent the spread of contamination during normal operation, including maintenance. The facilities in the changing area ~~included in these areas~~ should correspond to the requirements for access to the ~~potentially more contaminated of the two~~ area~~s~~ of higher ~~and its anticipated~~ contamination ~~levels~~.
154.	Russia/ROSATOM-11	5.10	Where justified by the possible contamination levels of air, the surfaces of equipment and rooms, consideration should be given…	It is not that air only that can be contaminated	x			Where justified by the possible contamination levels ~~of air contamination~~, the surfaces of equipment and rooms, consideration should be given…

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155.	Marocco-11	5.10	Where justified by the possible levels of ~~air~~ contamination, consideration should be given to the provision of permanent changing areas with decontamination facilities for personnel, monitoring instruments and storage areas for protective clothing.	All pathways of contamination should be taken into consideration.	x			See resolution of comment Russia/ROSATOM-11
156.	Russia/ROSATOM-12	5.11	Within the changing rooms, a physical barrier should be provided to separate clearly the clean area from the potentially contaminated area. The **sanitary locks** should be large enough to meet the needs during periods of maintenance work, including adequate space for storage of personal protective equipment and sufficient exit monitors. Sufficient space should be provided so that cross contamination between personnel is avoided. **The layout shall exclude a possibility of intersection of the personnel flows in their personal and protective clothing**. Allowance should be made for temporary personnel employed as contractors, for example during outage periods.	Add*The layout shall exclude a possibility of intersection of the personnel flows in their personal and protective clothing.			x	The paragraph already states that "Sufficient space should be provided so that cross contamination between personnel is avoided." Adding a requirement to exclude the possibility of interaction between personnel in different levels of protective clothing in all changing rooms would be overly prescriptive.
157.	Germany-64	5.12	Safety, security and monitoring requirements for access to and exit from controlled areas should be considered together in order to deliver optimised technical solutions, for example by the use of electronic personal dosimeters in accordance with Requirement 24: Arrangements under the radiation protection programme and especially Paras 3.88 - 3.90, 3.97 of GSR Part 3 [2].	Clarification, as mentioned paras belong to Req.24 of GSR Part 3. **Relevance 2**	x			

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158.	Indonesia-2	5.14/1	The routes for personnel through radiation zones **and contamination zone** should be minimized to reduce the time spent in transit through these zones.	To be consistent with para 7.15	x			and contamination zones
159.	Finland-22	5.15	Proposed modification: *To ~~minimize~~ **limit** the radiation doses to personnel working in the controlled area and the spread of contamination, the layout of the controlled area should be so designed that personnel do not have to pass through areas of higher radiation zones to gain access to areas of lower radiation zones.*	Please check the wording. optimize or limit?	x			To ~~minimize~~ **limit** the radiation doses to personnel working in the controlled area and the spread of contamination, the layout of the controlled area should be so designed that personnel do not have to pass through areas of higher radiation zones to gain access to areas of lower radiation zones.
160.	Germany-65	5.16	As far as reasonably practicable, the design should be such as to limit the possible spread of contamination and to facilitate the ~~erection of temporary containments~~ implementation of temporary confinements.	Clarification **Relevance 2**	x			As far as reasonably practicable, the design should be such as to limit the possible spread of contamination and to facilitate the ~~erection of temporary containments~~ implementation of temporary confinements.
161.	UK-19	5.17	Alter sub-item (6) as follows: "Components which will be operated frequently should be considered for remote or motorised operation. If this is not possible, they should be at a convenient height for working."	Remove the worker from the active area as the first step.	x			To add: (after 6)Components which will be operated frequently should be considered for remote or motorised operation. If this is not possible, they should be at a convenient height for working.

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162.	Finland-23	5.17	*(4) Provision of **easy** access to high radiation areas such as pressurized water reactors steamgenerator internals and the valves in the systems that contain primary coolant.*	"Easy access to high radiation areas" sounds incorrect, even though the idea behind this paragraph is reasonable. Please change the word easy to more suitable.	x			(4) Provision of ~~easy~~ access to high radiation areas such as pressurized water reactors steamgenerator ~~internals~~ and the valves in the systems that contain primary coolant. ~~Javier~~
163.	UK-20	5.18 - 5.26		Would this section benefit from a statement noting that embedded pipework is to be avoided?	x			5.20. …. noting that embedded pipework is to be avoided
164.	Japan-5	5.18, 5.19	*Combine as follows.*5.18. The design of nuclear power plant systems should include ~~be based on the feedback of experience gained in reducing radiation exposure at operating reactors.5.19. The~~ the following measures for reducing radiation exposure, ~~should be adopted in the system design~~ be with taking account of lessons learned from experience gained in reducing radiation exposure at operating reactors:	Duplication.			x	The point made in Para 5.18 is distinct from practical measures specified in para 5.19.
165.	Germany-66	Title before 5.18	OTHER DESIGN CONSIDERATIONS FOR AN EFFECTIVE ~~OPERATIONAL~~ RADIATION PROTECTION PROGRAMME	Term "operational programme" has been superseded (compare NS-G-2.7 with SSG-40 and GSG-7 and IAEA Safety Glossary 2016 with its version from 2018). **Relevance 2**	x			To delete in Section 7 as well
166.	Japan-6	5.19/(5)	The following measures for reducing radiation exposure should be adopted in the system design:……(5) For mutual standby systems, if it is necessary to repair or maintain one system while the other system	Clarification.Not only repairing works but also maintenance works would be included in this context.The same comments are in paras 5.17(3), 5.20、5.74 and 5.76.	x	Replace "repair" with "maintain".		It is agreed that "repair" is a too limited term. If it is replaced with "maintain" then this will include preventative maintenance as well as repairs.

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			is in operation, sufficient shielding should be set between the two systems.					
167.	UK-21	5.19 (1)	Add to sub-item 1 - "Where possible, components requiring regular maintenance should not be placed in high radiation fields."	Additional text suggested. If components require regular maintenance, they should not be in high radiation fields where possible.	x			
168.	UK-22	5.19 (4)	Methods for ~~countermeasures~~ (e. g. flushing) to avoid the sedimentation of radioactive sludge in piping and containers should be provided. Methods for dose reduction (e. g. flushing) to avoid the sedimentation of radioactive sludge in piping and containers should be provided.	'Countermeasures' is not a good term to use here. Alternative text suggested.	x			e.g. flush Methods for ~~countermeasures~~ dose reduction (e. g. flushing) to avoid the sedimentation of radioactive sludge in piping and containers should be provided.
169.	Finland-24	5.22	*Pipelines should be so designed that few venting and drainage lines are needed. Drainage shouldlead to a sump or a closed system. Pipelines should be designed to avoid causing fluid to collect inplaces.*	Please check the last sentence for clarity.	x			Change last sentence of para 5.22 to: Pipelines should be designed so as to avoid fluid collecting at low points.
170.	Germany-67	5.26	In direct cycle reactors (i.e. BWRs), the design of the steam drying system should be such as to ensure that the levels of radiation and surface contamination in the turbine building are low when the reactor is shut down (radiation levels are very high in direct cycle reactor turbine buildings during operation due to 16N in the steam phase of the primary coolant).	Clarification, to make text more reader-friendly **Relevance 2**		X "e.g. BWRs" rather than "i.e. BWRS". Replace "direct cycle reactor" with "BWR" in the example.		Other direct cycle reactor designs have been designed previously (e.g. SGHWR) and may be designed in the future so the point is not just applicable to BWRs.

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171.	Japan-7	5.34A	**Remote techniques**~~Consideration should be given to incorporating filters and demineralizers within concrete cells, and thus not accessible, together with shielded transport containers to enable relatively high dose rates to accrue on the filters, and thus to minimize radwaste and worker dose. Consideration should also be given to two trains of the coolant clean up filters, to allow continued clean up during oxygenation, while the other filter is removed.~~	The messages of this paragraph are far from remote techniques. Delete whole sentences or move this paragraph under appropriate subtitle.	x	Delete para 5.34A. Insert new para 5.52A: Consideration should be given to incorporating filters and demineralizers within concrete cells, and thus not accessible, together with shielded transport containers to enable relatively high dose rates to accrue on the filters, and thus to minimize radioactive waste and worker dose. Also insert new para 5.24A: Consideration should be given to two trains of coolant clean up filters or a single train system with multiple filters in parallel, to allow continued clean up during oxygenation, while the other filter is removed		
172.	UK-23	5.34A	Add at the end of the last sentence "…. or a single train system with multiple filters in parallel."	May be easier, and less waste for decommissioning, to have a single train with multiple filters.	x	See also resolution of comment Japan-7		
173.	Germany-68	5.34A	Consideration should be given to incorporating filters and demineralizers within concrete cells, and thus not accessible, together with shielded transport containers to enable relatively high dose	It is not apparent why this should be a subpoint to 5.34. Radwaste is not an official term in the Safety Glossary.	x	See also resolution of comment Japan-7		

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			rates to accrue on the filters, and thus ~~to~~ minimize ~~radwaste~~ radioactive waste and worker dose. Consideration should also be given to the incorporation of two trains of the coolant clean up filters, to allow continued clean up during oxygenation, while the other filter is removed.	**Relevance 2**				
174.	Germany-69	5.35	Criteria for the selection of remotely rather than manually operated equipment such as valves should be established in order to make the ~~'as low as reasonably achievable' (~~ALARA~~)~~ selection process more efficient. This should include consideration of ambient dose rate as well as frequency of use for normal operation.	The first time the formulation "as low as reasonably achievable" is used in para 2.38. Abbreviation ALARA should be used there, and not first in Para. 5.35. **Relevance 2**	x			~~as low as reasonably achievable' (~~ALARA~~)~~
175.	Germany-72	5.36	Access to high dose rate areas during operation ~~at power~~ for surveillance and maintenance should be avoided wherever practicable	"Operation at power" is not an official term in the Safety Glossary. **Relevance 2**			x	Although the term is not in the Safety Glossary, the meaning is unambiguous.
176.	Finland-25	5.38	Proposed modification: *For those few locations where permanent shielding cannot be installed, permanent storage locations should be provided for temporary shielding at locations that will minimise handling of shielding.* ***Also permanent framework for shielding purpose should be planned which will reduce the time used for preparation of the shielding.***			X Also, permanent frameworks for shielding ~~purpose~~ should be ~~planned~~ provided which will reduce the installation time ~~used~~ for temporary ~~preparation of the~~ shielding.		
177.	Germany-73	5.39	In designing a shield for a specific radiation source, the target dose rate should be set, for which account should be taken of the	Clarification.	x			Account should also be taken ~~in setting this target dose rate~~ of the

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			expected frequency and duration of occupancy of the area. Account should also be taken ~~in setting this target dose rate~~ of the uncertainties associated with the source term and with the analysis made to determine the expected dose rate.	**Relevance 2**				uncertainties associated with the source term and with the analysis made to determine the expected dose rate.
178.	Germany-70	5.42	The choice of materials for a shield should be made on the basis of the nature of the radiation (whether beta and bremsstrahlung, neutrons and gamma rays, or gamma rays only are produced), the shielding properties of materials (e. g. their degree of scattering, absorption, production of secondary radiation, activation), their mechanical and other properties (e.g. chemical, thermal and mechanical stability, compatibility with other materials, structural characteristics, toxicity, disposability, decontaminability), and space and weight limitations.	The term "stability" can be interpreted here as the mechanical stability of the shielding, but other aspects must also be considered. **Relevance 1**	x			
179.	Finland-26	5.44A	Proposed modification: *Neutron transport calculations around containment should be undertaken to eliminate* ***leak of neutron radiation***.			X		Neutron transport calculations around containment should be undertaken to eliminate leakage of neutron radiation (e.g. sky and ground shine paths.)
180.	Germany-71	5.44A	Neutron transport calculations around containment should be undertaken to eliminate sky and ground shine paths.	Clarification **Relevance 2**		X		See also resolution of comment Finland-26
181.	Germany-74	5.49	In the design of permanent shielding, account should be taken of relevant external hazards, in particular seismically induced forces, in accordance with the recommendations provided in SSG-67 [16]	Clarification, please use „seismically induced forces".	x			

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			and SSG-9 (Rev. 1) [17], and of relevant internal hazards, in accordance with SSG-64 [37].	**Relevance 2**				
182.	Germany-75	5.51	Where reactor coolant is used for shielding purposes (e. g. sufficient water coverage of spent fuel in spent fuel pools), or assumptions are made about the shielding effect of the reactor coolant on occupational exposure, automatic sensors and controls should exist for ensuring that levels of the liquid stay within permitted ranges.	Clarification. **Relevance 2**	x			
183.	Germany-76	5.52	The provision for shielding that is incorporated into the design to protect site personnel during plant operation from direct or scattered radiation should also be designed to ensure adequate protection of the public and the environment during plant operation as well.	Clarification. **Relevance 2**	x			
184.	Finland-27	5.55	***In some cases**, depending on the intensity and location of the source with respect to the penetration, no additional shielding features may be necessary. **In other cases**, plugs or labyrinths of complex design should be incorporated and computer based shielding calculations may be made to justify the design.*	This structure "In some cases ... In other cases…" makes it harder to understand what is really wanted to say in this paragraph. Please clarify.	x	Depending on the intensity and location of the source with respect to the penetration, no additional shielding features may be necessary. In some cases, plugs or labyrinths of complex design should be incorporated and computer based shielding calculations may be made to justify the design.		

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185.	Russia/ROSATOM-13	5.58	For the purposes of radiation protection, the primary objective of providing a ventilation system should be control and **reduce the contamination** of the working environment by airborne radionuclides and to reduce the need to wear respiratory protection.	Control of the contamination is not the only purpose of ventilation system as it also reduces it.		x ~~For the purposes of radiation protection~~ The primary radiation protection function ~~objective of providing~~ of a ventilation system should be to control and reduce the airborne radionuclides ~~of~~ in the working environment to reduce the need to wear respiratory protection.		~~Vaughan finalized the sentence~~ The primary radiation protection function of a ventilation system should be to control and reduce the airborne radionuclides in the working environment to reduce the need to wear respiratory protection.
186.	Russia/ROSATOM-14	5.59	-	It should be clarified what pressure differentials are meant - in the filters or between the rooms	x	Both the spread of contamination and the amount of releases to the environment should be limited by providing features such as air cleaning filters and by maintaining appropriate pressure differentials between rooms, across filters, and between plant systems and the environment.		5.60 efficiency of filter systems within the design specification
187.	India-1	Para: 5.63, Page: 54	Existing text: In addition to radiological hazards, nonradiological hazards posed by the leakage of primary coolant such as combustion in the case of liquid sodium' 1 or asphyxiation in the case of CO2	Comment: Examples quoted in the existing text are for FBR based NPPs. Since this guide is for 'water cooled reactors', examples of water cooled reactors may also be included.			x	The examples are intended to indicate chemical hazards that may be introduced by the leakage of primary coolant. ~~Vaughan~~ Could be worth including conventional

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								hazards with PWR systems ~~As this is just in the context of ventilation, Vaughan recommended to reject this suggestion.~~
188.	UK-24	5.65	Add an additional sub-item "The extract of potential contaminated air should not go near, or past, likely worker positions."	Aim to suck air away from worker locations.	x	Add sub-item: The need to avoid extracting potentially contaminated air near, or past, likely worker positions.		Ventilation systems should be designed to draw potentially contaminated air away from likely worker positions.
189.	Israel-8	5.68	The reference **[59]** mentioned in footnote number 12 of paragraph 5.68, is numbered as reference **[58]** in the list of the references**.**	Clarity/Editorial	x	Agreed, the reference in Footnote 12 should be [59] and the duplicate Reference [58] in the "References" section should be renumbered as [59]		
190.	Marocco-12	5.70	Special consideration should be given to rooms where leaks or spills of contaminated liquid might occur. These areas should be designed to allow easy decontamination (e. g. by means of a special coating on floors, easily decontaminated paint on the walls) and control of the spread of contamination. Adequate bunding and sloping of these rooms should be arranged to limit the contaminated areas and for the quick draining and collection of spilled liquids.	It is recommended to add also the example of an easily decontaminated paint on the walls as an element to take into consideration in the design phase.	x			
191.	Germany-77	5.71	The system of active floor drains should be extended to all rooms where there are systems that contain radioactive fluids. The rooms should be so designed that the floor	We suggest to simplify the text and make it easier for understanding.			x	It seems relevant and useful to state that the drains for design basis leaks should go to

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			channels and slopes are capable of draining design basis leaks in a controlled manner ~~to systems intended for active fluids~~.	**Relevance 2**				systems intended for active fluids.
192.	Germany-78	5.71 Line 6	… The sumps or the rooms should be provided with liquid level detectors that actuate a high ~~level~~ priority alarm. Recommendations on the design of alarms are provided in para. 5.66 of SSR-2/1 (Rev. 1) [1], in paras 4.143 - 4.176 of SSG-51 "Human Factors Engineering in the Design of Nuclear Power Plants" and partially in Section 8 of current Guide.	We suggest to make references to information about alarms more precise. **Relevance 1**	x			The sumps or the rooms should be provided with liquid level detectors that actuate a ~~high~~ level alarm as necessary.. Recommendations on the design of alarms are provided in paras 4.143 - 4.176 of SSG-51 [59A], in"Human Factors Engineering in the Design of Nuclear Power Plants" and ~~partially~~ in Section 8 of the current Guide.in Section 8. The para. 5.66 of SSR-2/1 (Rev. 1) [1]) should be also followed.
193.	Finland-32	5.71 and 5.72		Why floor drains and floor drain systems are under chapter "Decontamination". Floor drains and the management of spills and leaks could have their own chapter. Please consider this.	x			*New title* "**Floor drain systems**" *was added and paras 5.71., 5.72., 5.73. (now 5.76. 5.77., 5.78) was moved under this new title before para 5.79.*
194.	Russia/ROSATOM-15	5.73	The tank volume should also be sufficient to ensure that any releases of liquid radioactive effluent to the environment will ~~remain small~~ **not occur**.	Any releases of liquid radioactive effluents to the environment shall be prevented.			x	Updated per Comment Germany – 79
195.	Finland-28	5.73	*There should be an adequate tank volume so that any **temporary** transfers of radioactive water donot burden systems*	There should also be adequate tank volume for unexpected situations, for example in case of	x	See response to Comment Germany – 79		

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			that are intended for other purposes. The tank volume should also be sufficient to ensure that any releases of liquid radioactive effluent to the environment will remain small.	a primary circuit decontamination after fuel failures. The word "temporary" may not be the correct term here. Please clarify.				
196.	Germany-79	5.73	There should be an adequate/sufficient tank volume in floor drain system so that any temporary transfers of radioactive water do not burden systems that are intended for other purposes. ~~The tank volume should also be sufficient to~~ It should be ensured ~~ensure~~ that any releases of liquid radioactive effluent to the environment will remain ~~small~~ within authorized limits.	Please make wording in this para more precise. **Relevance 2**	x	There should be ~~an adequate/~~sufficient tank volume so that any temporary transfers of radioactive water through floor drain system (including transfers associated with infrequent events such as primary circuit decontamination) do not burden systems that are intended for other purposes. ~~The tank volume should also be sufficient to~~ ~~The tank volume should also be sufficient to ensure~~ It should be ensured that any releases of liquid radioactive effluent to the environment will remain ~~small~~ within authorized limits. See relevant recommendations in Ref SSG-62 [30]as well.		See Ref to SSG-62 as well
197.	Germany-80	5.74	The coatings and/or the lining of fuel storage pool and fuel handling pools, as well as the equipment used in these areas, will become contaminated. When the water	Clarification	x	The coatings and/or the lining of fuel storage pool and fuel handling pools, as well as the		

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			level in such pools is lowered, surfaces may dry out, and the dispersal of material on the surfaces into the air may cause a hazard due to airborne radioactive material. Systems should be provided for decontaminating such surfaces before they dry out. Systems should also be provided for decontaminating, before they dry out, of fuel transport flasks and components that may have to be removed from the pools for repair.	**Relevance 2**		equipment used in these areas, will become contaminated. When the water level in such pools is lowered, surfaces may dry out, and the dispersal of material on the surfaces into the air may cause a hazard due to airborne radioactive material. Systems should be provided for decontaminating such surfaces before they dry out. Systems should also be provided for decontamination, before they dry out, of fuel transport flasks and components that may have to be removed from the pools for repair.		
198.	Finland-29	5.79	From 5.79 *Waste treatment systems* Should there be a requirement related to radioactive sludges and how they should be considered in design?		x	Modification to Item 5.80: The design should be such as to minimize the sedimentation of radioactive sludge or the deposition of resins and evaporation concentrates in the piping and components of the waste treatment system, as well as their crystallization and deposition in tanks.		Sludge added to Item 5.80, using wording consistent with Items 5.19 and 7.21

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199.	Finland-30	5.80	*The design should be such as to minimize the deposition of resins and evaporation concentratesin the piping and components of the **waste treatment system**, as well as their crystallization anddeposition in tanks.*	Minimizing deposition should be a general design requirement in systems, where there is radioactivity. Now it only should be notified in waste treatment systems. In some cases it is desirable to use deposition to trap radioactivity. Please consider making this more general paragraph			x	This is covered in sections 5 paras 5.18-5.26
200.	Germany-81	5.83	Facilities should be provided for the safe storage of spent fuel and of the radioactive waste that arises at the plant. Design of spent fuel storage should take into account Requirement 80 of SSR-2/1 (Rev. 1) [1], "Fuel handling and storage systems". Paras. 6.64-6.68A as well as requirements from SSG-15 (Rev. 1) [45], *Storage of Spent Nuclear Fuel* and SSG-63 [31], *Design of Fuel Handling and Storage Systems for Nuclear Power Plants*. Safe storage of the radioactive waste should especially take into account~~, with account taken of~~ its form (solid, liquid, gas or a mixture), its radionuclide content and its nature in terms of the extent to which it has been processed. The safe storage of waste will depend in part on the design, construction, operation and maintenance of the facility concerned. The design features of facilities should be such that the radioactive waste can be received, handled, stored and retrieved without causing undue occupational or public exposure or environmental effects. Further recommendations on this subject	Although the title of this section is "Storage of spent fuel and radioactive waste at the plant", text itself is concentrated mostly on "radioactive waste".Please include statements concerning "spend fuel" with appropriate references. Please add reference to SSG-62, as SSG-62 provides recommendations on the design of systems for Treatment and Control of Radioactive Waste and Radioactive Effluents. **Relevance 1**	x			Only change on para 5.83 is adding para. Of the reference SSG-40 and SSG-62: Facilities should be provided for the safe storage of the radioactive waste that arises at the plant, with account taken of its form (solid, liquid, gas or a mixture), its radionuclide content and its nature in terms of the extent to which it has been processed. The safe storage of waste will depend in part on the design, construction, operation and maintenance of the facility concerned. The design features of facilities should be such that the radioactive waste can be received,

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			are provided in SSG-40 [11] and SSG-62 [30].					handled, stored and retrieved without causing undue occupational or public exposure or environmental effects. Further recommendations on this subject are provided in para. 6.73–6.83 of SSG-40 [11] and in para. 4.199–4.232 of SSG-62 [30]. Additionally add a new para 5.83A after para 5.83: 5.83A Facilities should also be provided for the safe storage of the spent fuel. Further recommendations on radiation protection aspects in the design of a spent fuel storage facility are given in para. 3.45-3.48 and para. 3.107–3.112 of SSG-63 [31], Design of Fuel Handling and Storage Systems for Nuclear Power Plants.
201.	UK-25	5.83 – 5.91		Would this section benefit from a requirement for being able to inspect the spent fuel / waste to monitor and confirm its condition?			x	SSG-63 and SSG-40 are providing recommendations on the topic

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								See also para 5.34 in Section 5 on inspection of the spent fuel See response to Comment Germany – 82
202.	Germany-82	5.84	The design of storage facilities for spent fuel and radioactive waste should incorporate the following functions: *(a) Maintaining the confinement of stored materials;(b) Maintaining subcriticality (in spent fuel storage facilities);(c) Providing for radiation protection (by means of shielding and contamination control); (d) Providing for the removal of heat (from spent fuel); (e) Providing for ventilation, as necessary; (f) Allowing the retrieval of the spent fuel (or 'irradiated fuel') and radioactive waste for transport off the site.*	Current list is a copy of para. 6.23 of WS-G-6.1. It looks like that not all issues from SSR-2/1 (Rev. 1), especially from Requirement 80, are considered in this list (e.g. concerning treatment and control, movement of waste etc), please check if this list needs actualisation. **Relevance 1**	x	Added subitems for consistency with WS-G-6.1 Para 6.23: (This doesn't totally cover SSR-2/1 Rev. 1 Requirement 80; 5.84. The design of storage facilities for spent fuel and radioactive waste should incorporate the following functions (see para SSG-40 ~~6.23 of WS-G-6.1~~): (a) Maintaining the confinement of stored materials; (b) Maintaining subcriticality (in spent fuel storage facilities); (c) Providing for radiation protection (by means of shielding and contamination control); (d) Providing for the removal of heat (from spent fuel); (e) Providing for ventilation, as necessary; (f) Providing for inspection and/or monitoring of the waste packages and storage facility, as necessary; (g) Allowing for		~~Tobias~~ ~~To check the list list~~ ~~This para should be deleted as its content is based on a Guide that has been superseded by multiple other Guides. In the newer Guides there is a clear distinction between the design of storage facilities for spent fuel and that ones for radioactive waste. The functions that need to be implemented are listed for spent fuel in SSG-63 (e.g. para 3.47) and for radioactive waste in SSG-62 (e.g. para. 4.200). Both are listed as references for further information in the para 5.83 and 5.83A, so there is no need for this one.~~

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						maintenance and repair of waste packages; (h) Allowing the retrieval of the spent fuel (or 'irradiated fuel') and radioactive waste for transport off the site; (i) Allowing for expansion of the storage capacity, as appropriate; (j) Allowing for movement of waste inside the storage facility (k) Consideration for eventual decommissioning.		
203.	Germany-83	5.85	The storage facility should provide protection for the waste to prevent degradation that could pose problems for operational safety during its storage or upon its retrieval…. with account taken of the following:(a) Chemical stability against corrosion caused by processes acting within the waste and/or caused by external conditions; ….	Clarification **Relevance 2**	x			
204.	Germany-84	5.89	Where appropriate, equipment should be provided with suitable interlocks or physical limitations to prevent dangerous or incompatible operations, such as the incorrect placement of waste, the accidental release of loads or the application of incorrect forces in lifting and handling operations, as such operations ~~. Such interlocks or limitations should prevent undesirable movement (for example, the movement of waste that~~ give rise to high dose rates ~~into an area occupied by site~~	Current para is a citation of WS-G-6.1, para. 6.34.Please make the citation in full, otherwise important design aspects are missing. Please make clear that there might be, at least, two reasons for provision of interlocks or physical limitations:1) in order to prevent dangerous or incompatible operations2) for		x		Ben checked: with SSG-40 WS-G-6.1 has been superseded by SSG-40, so WS-G-6.1 is not referenced. SSG-40 does not contain the interlock guidance. The comment is accepted, but without reference to WS-G-6.1.

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			~~personnel or vice versa).~~ (see para 6.34 of WS-G-6.1).Additionally, interlocks could be used for the purposes of control of access and occupancy, see para. 5.13.	purposes of control of access and occupancy **Relevance 1**				Proposed updated wording: "Where appropriate, equipment should be provided with suitable interlocks or physical limitations to prevent dangerous or incompatible operations, such as the incorrect placement of waste, the accidental release of loads or the application of incorrect forces in lifting and handling operations, as such operations ~~Such interlocks or limitations should prevent undesirable movement (for example, the movement of waste that~~ give rise to high dose rates ~~into an area occupied by site personnel or vice versa).~~ Additionally, interlocks could be used for the purposes of control of access and occupancy, see para. 5.13"
205.	Germany-85	5.90	The need for remote handling should be considered in cases where the waste container gives rise to high dose rates or where there is a risk that radioactive aerosols or gases could be released to the working environment. Recommendations	Please add as reference WS-G-6.1. **Relevance 1**			x	Ben checked: with SSG-40 WS-G-6.1 has been superseded by SSR-40, so WS-G-6.1 is not referenced. SSR-40 does

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			on provisions for waste handling are given in WS-G-6.1 "Storage of Radioactive Waste", paras 6.32 – 6.36)					not contain the remote handling guidance. The comment to add reference to WS-G-6.1 is rejected.
206.	Germany-86	5.91	Any remote handling devices should be designed to provide means for their maintenance and repair, for example, by the provision of a shielded service room, to keep occupational radiation exposures as low as reasonably achievable. Their design should incorporate means to recover and to return to a stable and safe state in the event of a malfunction or breakdown (see para. 6.36 of WS-G-6.1).	Current para is a citation of WS-G-6.1, para. 6.36. Please make the citation in full, otherwise important design aspects are missing. **Relevance 1**		x		Ben checked: with SSG-40 WS-G-6.1 has been superseded by SSR-40, so WS-G-6.1 is not referenced. SSR-40 does not contain the remote handling guidance. The comment is accepted, but without reference to WS-G-6.1. Proposed updated wording: Any remote handling devices should be designed to provide means for their maintenance and repair, for example, by the provision of a shielded service room, to keep occupational radiation exposures as low as reasonably achievable. Their design should incorporate means to recover and to return to a stable and safe state in the event of a malfunction or breakdown.

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207.	Israel-9	5.92	In the last sentence of this paragraph (discharge criteria), the reader is turned to paragraph **3.37** of this Safety Guide. However, paragraph 3.37 addresses different subjects (radiation shielding). We have also checked the document NS-G1.13 (which is superseded by the present safety guide – but there is no paragraph **3.37** in that Guide.	Clarity/Editorial	x	See response to the Comment Germany – 87		paragraph ~~**3.37**~~ **2.26**
208.	Russia/ROSATOM-16	5.92 /Lines 1-3	To protect the public from radiological consequences due to the operation of the plant, plant operators are required to ensure that doses to members of the public arising from radioactive substances in the discharged effluents and from direct radiation due to the plant do not exceed the prescribed limits	Since the text is related to protection of the public, it is advisable to specify that it is about effluents being discharged.	x	To protect the public from radiological consequences due to the operation of the plant, plant operators are required to ensure that doses to members of the public arising from radioactive substances in the effluents that have been discharged and from direct radiation due to the plant do not exceed the prescribed limits…		Vaughans: effluents that have been discharged
209.	UK-26	5.92	The design should be such that regulatory limits for discharges will not be exceeded and will be as low as reasonably achievable.	Additional words (highlighted) added to improve readability and correction to typo.	x			Editorial
210.	Germany-87	5.92 Line 7	….The design should be such that regulatory limits for discharges will not be exceed and are as low as reasonably achievable. This is commonly done by specifying discharge limits for the most	Please check reference, para 3.37 is about shielding. Perhaps para 2.26 is a correct one? **Relevance 2**	x	The design should be such that regulatory limits for discharges will not be exceeded and will be as low as reasonably achievable. This is commonly done by		

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			significant radionuclides, as described in para. ~~3.37~~ 2.26 of this Safety Guide.			specifying discharge limits for the most significant radionuclides, as described in para. ~~3.37~~ 2.26 of this Safety Guide.		
211.	Germany-88	5.95	*Minimisation of ~~the~~ frequency and impact of events~~,~~ that have the potential to increase public dose should be considered.*	Statement is very general. Therefore, it would be useful to add a sentence putting it into the context of the discharge criteria. The purpose of the required minimisation should also be mentioned **Relevance 1**	x	Minimisation of the frequency and impact of the events~~,~~ that have the potential to increase public dose from discharges should be considered.		Vaughan: Some events on the plant, not related to the discharge system have the potential to impact discharges.
212.	Germany-89	5.97 Line 4	… The isotopes of iodine, for which an operational ~~operating~~ limit should be specified, are an example.	Please put in line with terminology according to Safety Glossary **Relevance 2**	x			Editorial
213.	Russia/ROSATOM-17	5.98 Lines 1-4	5.98. The flows and the specific activity ~~activity concentrations~~ of liquid and gaseous effluents need to be monitored and controlled to ensure that the regulatory discharge limits are not exceeded (SSR-2/1 (Rev. 1) [1]). Liquid and gaseous waste treatment facilities that are based on the best practicable means should be provided, as discussed in the following subsections.	1. The term “activity concentration” is incorrect.2. It is advisable to add the word “waste” (noun) because the word “gaseous” is adjective and this may result in incorrect translation to other languages (Russian, in particular) of the whole phrase “liquid and gaseous treatment facilities”	x	The flows and the specific activity ~~activity concentrations~~ of liquid and gaseous effluents need to be monitored and controlled to ensure that the regulatory discharge limits are not exceeded (SSR-2/1 (Rev. 1) [1]). Liquid and gaseous waste treatment facilities that are based on the best practicable means should		

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						be provided, as discussed in the following subsections.		
214.	Russia/ROSATOM-18	5.99 Subsection title	Liquid waste treatment system	To add the word "waste", by the same reason as above (the comment 17).	x	Change to "Liquid waste treatment systems" Also, prior to 5.103 "Gas treatment system" should become "Gaseous waste treatment systems"		
215.	Russia/ROSATOM-19	5.99 Line 1	The major sources of liquid waste ~~contaminated water~~ that require treatment include:	See comment 1.			x	Vaughan it is contaminated water rather than liquid waste
216.	Russia/ROSATOM-20	5.99 Lines 6-7	Where non-aqueous liquid waste (such as spent oil) is generated in sufficient volumes, the provision of a separate waste treatment system to deal with it should be considered.	It is advisable to give more example of non-aqueous liquid waste, because above in the para 5.99 there is a list of aqueous waste sources.	x	Where non-aqueous liquid waste (such as spent oil or organic solvents) is generated in sufficient volumes,		Vaughan e.g. organic solvents
217.	UK-27	5.99	~~The foregoing are~~ essentially aqueous in nature…. To read: These are essentially aqueous in nature	Words (highlighted) amended to improve readability The same suggestions applies to para 7.65.	x	These sources are essentially aqueous in nature		
218.	Finland-31	5.103	for example *All discharges of radionuclides to the atmosphere should be reduced by the best practicablemeans and are required to be subject to the applicable authorized limits, including dose constraints and optimization requirements (see Section 2).*	Term "the best practicablemeans" is used quite regularly in this draft. Does this term include the use of best available technique (BAT-principle).	x	See Response to Comment UK-28 All discharges of radionuclides to the atmosphere should be reduced as low as reasonably achievable and are required to be subject to the applicable authorized limits,		

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						including dose constraints and optimization requirements (see Section 2).		
219.	UK-28	5.103	All discharges of radionuclides to the atmosphere should be reduced ~~by the best practicable means~~ and are required to be subject to the applicable authorized limits, including dose constraints and optimization requirements (see Section 2). Suggested change to: All discharges of radionuclides to the atmosphere should be reduced as low as reasonably achievable and are required to be subject to the applicable authorized limits, including dose constraints and optimization requirements (see Section 2).	Alternative text provided as shown, that is aligned to the GSR Parts 3 and 5.	x			
220.	Marocco-13	5.109	The plant design should include the auxiliary facilities that are necessary for effective radiological control in the operation and maintenance of the nuclear plant and for responding to emergencies. In particular, auxiliary facilities are necessary for limiting the spread of contamination within the controlled area and preventing the spread of contamination outside the controlled area, for carrying out adequate monitoring of the workplace and individual monitoring, for providing the workers with the required protective equipment, and for managing other health physics operations. These auxiliary facilities should include the following: ( )	It is suggested to add to the list an effluent storage tank area.	x	Add subitem: An effluent storage tank area after item (11)		

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221.	UK-29	6.1 (c)	"Density, distribution and habits of the population"	Additional words (highlighted). The habits, particularly in terms of food ingestion can vary from region to region and can have a significant impact of doses to the public following an accident.	x			
222.	Germany-90	6.1 Line 5	The aspects to be addressed in the suitability assessment should include the following: …(c) Density and distribution of the population (see NS-G-3.2 [19]), relevant to evaluate the risk for individuals and for the population, and other characteristics of the area surrounding the nuclear installation that could affect the feasibility of planning effective emergency response actions (see SSR-1 [4]);(d) In case of multi-unit sites, the effects of events ~~having~~ in one NPP unit with radiological consequences to one or more other units ~~outside of one of the units and affecting the other units~~ (see SSG-79 [62])	Clarification. **Relevance 2**	x			
223.	Germany-91	6.4 Line 4	… For the efficient communication in the escape routes, the design of ~~a~~ suitable and reliable alarm and communication systems should be considered, for warning and instructing all persons present in the facility and on the site and seeking to minimize the risk of radiation hazard.	Clarification **Relevance 2**	A			
224.	Germany-92	6.6	The possible radiological consequences of design basis accidents and design extension conditions, including severe accidents and accident conditions that must be practically eliminated, should be determined to demonstrate compliance with design targets related to protection of site personnel, the	Practically eliminated accident conditions should be mentioned here, as their elimination does not affect the need to consider the possible radiological consequences and			x	The practical eliminated conditions are not considered in the design

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			public and the environment, in accordance with the Requirement 5 of SSR-2/1 (Rev.1) [1] (see para 2.3 of this Safety Guide).	misinterpretations can be avoided by this short mention. **Relevance 1**				
225.	Germany-93	6.7	*There is no paragraph 6.7.*	Please verify **Relevance 2**	A			6.7 was deleted and moved to Section 3 as 3.28A: To cover both operational states and accident conditions, it was appropriate to move the para to general section 3.
226.	Germany-94	6.14	Provisions should be made for shielding the radiation, in addition to those provisions required during operation, to ensure that personnel can have access to and can occupy the relevant working places so as to operate and maintain safety features for the prevention and/or mitigation of events ~~essential equipment~~[16] without exceeding established dose limits as specified in paras 4.12 - 4.19 of GSR Part 3 [2] and paras 5.49 - 5.61 of GSR Part 7 [9] 17. This includes access to equipment in cases where maintenance or repair may be necessary after an accident. In general, provision should be made for non-personal interventions ~~to render direct intervention by operators superfluous~~ by installing automatic or remotely controlled equipment (e. g. remotely controlled valves).	Essential equipment is not a term from Safety Glossary. We would like to suggest wording, as in DS508. **Relevance 1**		x		~~Javier~~ To reject the change for : safety features for the prevention and/or mitigation of events , Instead of "essential equipment" to incorporate the footnote the provides more relevant information (in foot note 17, to add Ref. para 4.14 of GSG-7) See Germany-95

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
227.	Germany-95	6.14Footnote 16	~~Essential equipment here means equipment that should continue to be operable to prevent the escalation of an accident or further radioactive releases (e. g. pumps in water cooled reactors or gas circulators in gas-cooled reactors, which are required to maintain core cooling), and equipment that is required for monitoring the state of the plant after an accident.~~	Footnote should be deleted, if you except term-replacement for "essential equipment". **Relevance 1**	x			Modified text: 6.14. Provisions should be made for shielding the radiation, in addition to those provisions required during operation, to ensure that personnel can have access to and can occupy the relevant working places so as to operate and maintain ~~essential equipment~~ equipment that should continue to be operable to prevent the escalation of an accident or further radioactive releases (e. g. pumps in water cooled reactors or gas circulators in gas-cooled reactors, which are required to maintain core cooling) without exceeding established dose limits as specified in paras 4.12 - 4.19 of GSR Part 3 [2] and paras 5.49 - 5.61 of GSR Part 7 [9]1 and equipment that is required for monitoring the state of the plant after an accident. This includes access to equipment in cases where maintenance or repair

[1] In the event of an emergency, radiation dose limits for normal operation may be exceeded. Use should then be made of dose levels given in para. 4.15 of GSG-7 [10] and other conditions as established in Section 4. para. 4.14. of GSG-7 [10] for interventions in emergencies.

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								may be necessary after an accident. In general, provision should be made to render direct intervention by operators superfluous by installing automatic or remotely controlled equipment (e. g. remotely controlled valves).
228.	Finland-33	6.18	Proposed modification:*…safe locations for* ***vehicles used to measure air dose rate and contamination levels as well as perform radionuclide analyses***.	The formulation of the text is a bit confusing. It would be more logical, if the listed vehicles were defined by their purpose in stead of their characteristics.Does it, for example, mean the safe locations are not needed for the vehicles that do not contain GPS or adequate filtration? Or does it perhaps mean that, in addition to safe locations, the consideration should also be given to the provision of the vehicles containing such equipment? In the latter case it might be better to split the text into separate paragraphs.				A with modification (see Germany-96)
229.	Germany-96	6.18	Consideration should be given to the provision of safe locations for ~~monitoring~~ vehicles, involved in the monitoring process, which are equipped with systems or equipment for air dose rate measurement, air concentration measurement, radionuclide analysis, GPS and adequate filtration.	Clarification **Relevance 2**	A			(to take into account Finland-33 comment : ..."equipped with, for example, ...")

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230.	Germany-97	6.19 Line 3	… ~~Multi system~~ Diverse communication systems (e.g. with provision of satellite phone) should be secured between the control room, the supplementary control room, other emergency response facilities and locations and assembly points for personnel.	Please stay in line with previous statements, here with para 2.22 **Relevance 2**	A			
231.	Finland-34	6.20	***The ready identification of rooms clearly marked signs*** *and the removal of any obstacles to the free movement of site personnel in passageways should be ensured for the protection of personnel, mainly by decreasing the duration of exposures during safety related actions under accident conditions. These factors should be taken into consideration and dealt with appropriately at the design stage.*	It is unclear, what does the first part of the sentence want to say. Please clarify.	A			Editorial To add: The "ready" (e.g. rediness to act) identification of rooms clearly marked signs… (English mother tongue to review)
232.	UK-30	After 6.22	"The design should also consider the long-term maintenance of plant required to operate for an extended period following an accident. Appropriate assessments of the long-term dose rates shall be provided which demonstrate that maintenance of such plant would be feasible flowing all type of accident, including Severe Accidents."	Once the plant has been placed in a safe shutdown state it may not be possible to return the plan to normal operation (e.g. after a severe accident) in such cases the design should be such that plant required to maintain the safe shutdown state can be adequately maintained, possibly for decades.	A			6.22A "The design should also consider the long-term maintenance of plant required to operate for an extended period following an accident. Appropriate assessments of the long-term dose rates shall be provided which demonstrate that maintenance of such plant would be feasible flowing all type of accident, including Severe Accidents."
233.	UK-31	6.25	It should be postulated that releases to the atmosphere may end up in the surface water through rain and/or wind, or due to	This implies materials is washed out from the plant, which is confusing or misleading.		x		Accepted with modification (need to add relevant vocabulary

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			washing out of radioactive materials ~~inside the plant,~~ increasing the content of fission products in the aquatic environment. Suggest deletion of highlighted text	In this context the term 'wash out' is referring to rain washing radioactive material from the atmosphere to a water body. Additional words (highlighted) to improve clarity.				to point out that radioactive material in the plant can be drained to the aquatic environment) Realise to the aquatic environment could happen through releases to the atmosphere …..
234.	Germany-98	6.25	Generally, the releases that are evaluated in the current Safety Guide for accident conditions are releases to the atmosphere, since NPPs of designs with an accidental release of radioactive material directly to the aquatic environment are out of scope of this document ~~usually unlikely~~. However, ~~this~~ accidental release of radioactive material to the aquatic environment should be verified for each design or each plant, and consideration should be given, for instance, to the contamination of groundwater by direct leakages. It should be postulated that releases to the atmosphere may end up in the surface water through rain and/or wind, or due to washing out of radioactive materials inside the plant, increasing the content of fission products in the aquatic environment.	According to the Scope, this Safety Guide is intended for use primarily for land based, stationary nuclear power plants with water cooled reactors. However, as innovative technologies in NPP Designs are in coming (see e.g. DS537), careful attention should be paid to statements, which might be misunderstood in near future. **Relevance 1**		x		A with modification No change in the first sentence only to add to the end "for land based NPPs." To keep only the second part of the comment "However, accidental release of radioactive material to the aquatic environment"
235.	UK-32	p 65	Consistent title formatting	Currently protection to worker (p65) and protection to public (p68) use different levels of title formatting.	A			Editorial
236.	UK-33	6.27	'For design basis calculations the effects of any potential protective actions should NOT be considered.'	Additional sentence suggested to make it clear that emergency protective actions should not be			x	The "conservative assumption" contains that already. ~~Vaughan agreed~~

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
				considered in design basis estimations for doses to the public.				
237.	India-3	Para: 6.28, Page: 69	Within the off-site areas where protective actions are planned in the event of an ~~a severe~~ emergency	There is no term defined as 'severe emergency' in IAEA glossary. Hence the term may be replaced by "emergency" or any other suitable term defined in the IAEA glossary	x			
238.	UK-34	6.30	'Maximise the integrity of primary system pipework'	It looks like only fuel cladding and containment integrity have been discussed but there is a third which is maintaining any activity leaked from fuel in the primary circuit.	x			A with modification between (2) and (3) : "Providing design means to maximize the integrity of primary system pipework" Vaughan agreed
239.	UK-35	6.30 (7?)	Ensure adequate safety features are provided to condense steam and/or maintain containment pressures within design limits following all accidents including Severe Accidents.	New para suggested. Given the other points mentioned this seems conspicuously missing. Other safety measure such as a core catcher or in-vessel retention provisions could also be mentioned but ensuring survivable containment pressures seems the most pertinent.	A			New bullet after (3) Ensure adequate safety features are provided to condense steam and/or maintain containment pressures within design limits following all accidents including Severe Accidents. Vaughan checked
240.	Germany-99	6.30	Design measures that may be used to achieve reductions in radiological consequences for the public of radioactive releases in accident conditions include: Ensuring that event sequences and accident scenarios potentially leading to early radioactive releases or large radioactive releases are 'practically eliminated' (see details in SSR 2/1 Rev.1 and	Please include references for the application of the practical elimination. The new Safety Guide DS508 is expected be released before the current one.What exactly are these barriers and how should they be protected? Please clarify.		x		Providing design means to minimize the ~~scope~~ damage of fuel cladding New bullet was added on UK-34 New item (10) ~~Defining an exclusion zone at the design stage to which~~

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			DS508);Providing design means to minimize the scope of fuel damage and protect the **barriers** against releases of fission products from the fuel;…..(10) Defining a~~n exclusion~~ zone in ~~at~~ the design stage to which public access is not permitted and therefore prevented.	**Relevance 1**				~~public access is prevented.~~ Providing means of controlling access to radiologically controlled areas." Vaughan agreed
241.	UK-36	6.32	For design extension conditions, analysis should be performed to demonstrate the scope and duration of the emergency ~~countermeasures~~ protective actions to be implemented; the demonstration should be based on considerations related to established reference levels. Use of emergency ~~countermeasures~~ protective actions (e. g. sheltering, iodine prophylaxis and relocation of people) may be considered in safety demonstration of design. Such consideration should be limited in area and time, and in accordance with national regulations. Dose reduction factors can be applied provided that clear instructions in emergency plans are available and that sufficient time and other conditions allow to ensure, with high level of confidence, that those ~~countermeasures~~ protective actions can be implemented.	'Countermeasures' is a term no longer used in IAEA Standards. Replace with 'protective actions'.	A			"protective actions" instead of "~~countermeasures"~~ safety demonstration ~~of design.~~
242.	Germany-100	6.32 Line 6	… Dose reduction factors can be applied under the condition ~~provided~~ that clear instructions in emergency plans are available and that sufficient time and other conditions allow to ensure, with high level of confidence, that those countermeasures can be implemented.	Text is difficult to understand, please clarify **Relevance 2**	A			

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
243.	UK-37	7.2	Change wording "proper" to "robust"	Clarity of wording.	A			Editorial
244.	Germany-101	7.2 Line 3	Decommissioning actions, included in the initial, updated and the final decommissioning plan, should be designed to achieve the progressive and systematic reduction in radiological hazards during decommissioning. The design for these actions should include a proper planning and assessment, in accordance with national regulatory requirements, to (1) ensure~~,~~ protection of workers and the public and protection of the environment and to (2) demonstrate that the decommissioned facility achieves the planned end state.	Clarification, to make the text clearer **Relevance 2**	A			Editorial
245.	Marocco-14	7.2	7.2. |...) Summary of decommissioning plans should be included in the safety analysis report of different plant stages and submitted to the regulatory authority when applying for different licences (for example construction, commissioning, operation, and decommissioning licences).	We acknowledge that the licences indicated in this paragraph are the main types that the operator should get through the lifetime of the nuclear power plant. However, it is preferable to mention that these are just examples since the operator might need to apply for additional licences (e.g.: siting, design, closure/shutdown), depending on the national requirements.	A			
246.	Germany-102	7.4	The paras 5.1 ~~and 5.2~~ – 5.3 of this Safety Guide provide general recommendations for the plant layout for operational states. In addition, ~~I~~in the design of the plant layout, a careful assessment should be made of the access requirements also for decommissioning of equipment. The design of the layout of the plant should take into account the necessity to limit the exposure	Please verify these references. We think para. 5.3 is to be mentioned as well. As Section 5 is all dedicated to plant layout, please specify that recommendations in paras 5.1 – 5.3 are general ones.	A			

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			of site personnel during decommissioning. Worker dose reduction can be also achieved with adequate layout design to give enough space for cutting and segmenting operations.	**Relevance 2**				
247.	UK-38	7.5	Greater space and flexible egress routes for waste / SSCs could be provided through the creation of new openings. Consideration should be given to the design of the civil structure to facilitate the openings being revealed in decommissioning.	Additional text suggested. It is not possible in all cases to provide enough space in the initial design. Layout requirements will be different to those in generation and therefore consideration should be given to how the plant can be adjusted to improve efficiency and lower risks in decommissioning. More openings also provide more flexible egress routes to remove waste and SSCs.	A			To add at the end Greater space and flexible egress routes for waste / SSCs could be provided through the creation of new openings. Consideration should be given to the design of the civil structure to facilitate the openings being revealed in decommissioning.
248.	Germany-103	7.5	Before the start of decommissioning the plant layout should be reviewed to assess whether there are needs to initiate radiation protection related changes in the layout (for example by providing additional shielding ~~enough space for cutting and segmenting activities)~~ requested by the final decommissioning plan.	Example with enough space is used already in para 7.5 and fits more to primary design. **Relevance 2**		x		Before the start of decommissioning the plant layout should be reviewed to assess whether there are needs to initiate radiation protection related changes in the layout ~~(for example providing enough space for cutting and segmenting activities)~~ requested by the final decommissioning plan.
249.	Marocco-15	7.6	7.6. [... 1 The dose estimation should not only cover dismantling but also preparatory work, clean-up after	Monitoring activities that include sampling and measurement of samples should also be considered in the dose estimation, since they	x			as well as monitoring activities (sampling and measurement of samples)

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			dismantling and activities related to waste handling as well as monitoring activities	might give rise to exposure of concerned workers to radiations.				
250.	UK-39	7.7	This paragraph supports the previous comment.		x			OK
251.	UK-40	7.8	Consider moving the last sentence in paragraph 7.8 to the beginning of the paragraph.		x			
252.	UK-41	7.8	Consider moving paragraph 7.8 before paragraph 7.7		x			
253.	Germany-104	7.8	Provisions should be designed and regularly reviewed for controlling access and the exit(s) from the controlled areas and for monitoring persons and equipment leaving the controlled areas for decommissioning needs as well. The design should consider each decommissioning phase. Before the decommissioning starts, the design should be reviewed, identifying and re-evaluating, and if it is necessary modifying, the access and exit points for personnel and for materials and equipment and zones for the decommissioning.	Please include punctuation, otherwise text is difficult to understand. **Relevance 3**	x			Before the decommissioning starts, the design should be reviewed, identifying and re-evaluating, and if it is necessary modifying, the access and exit points for personnel and for materials and equipment and zones for the decommissioning. Provisions should be designed and regularly reviewed for controlling access and the exit(s) from the controlled areas and for monitoring persons and equipment leaving the controlled areas for decommissioning needs as well. The design should consider each decommissioning phase.
254.	UK-42	7.13	Access and occupancy requirements will be different in decommissioning to those	Additional text to 7.13 or possibly a new paragraph suggested.		x		New para: 7.13A.

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			during operations. As the plant progresses through the different decommissioning phases the levels of access control will need to be adapted to reflect the changing risk profile on the site.	Once the reactor has been defueled many of the barriers/security arrangements can be simplified. A proportionate approach should be adopted which reflects the risks on site as decommissioning progresses.				As the plant progresses through the different decommissioning phases the levels of access control should be adapted to reflect the changing risk profile on the site.
255.	Germany-105	7.13	Paragraphs 5.12-5.17 provide recommendations for the access to and exit from controlled areas for the operational states. These recommendations should be considered for the decommissioning as well. Before the decommissioning starts the design of these points should be re-assessed, including their classification, to ensure that the systems provided to protect workers from doses above authorized limits are adequate.	Please check the references, as all the chapter provides such recommendations. **Relevance 2**	x			
256.	Germany-106	7.14	The recommendations provided in para. 5.13 of this Safety Guide are also applicable to decommissioning. Before the decommissioning starts, the design of the applicable systems ~~(see para 5.13) these systems~~ should be re-assessed, including their safety classification, and systems provided to protect workers from doses above authorized limits should be modified.	Clarification **Relevance 2**	x			Editorial
257.	Indonesia-3	7.18/3	As far as practicable, the revised design for the decommissioning should be such as to limit the possible spread of contamination during decommissioning and to facilitate the erection of temporary containments needed for decontamination and **dismantling** activities.	Temporary containments to prevent the spread of contamination are also needed for dismantling activities.	x			

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
258.	Germany-107	7.18	As far as reasonably practicable, the revised design for the decommissioning should be such as to limit the possible spread of contamination during decommissioning and to facilitate the implementation of temporary confinements ~~erection of temporary containments~~ needed for decontamination activities.	Clarification **Relevance 2**	x			
259.	Indonesia-4	7.19/2	The design or the revised design for decommissioning should be such that the occupancy time necessary in radiation areas and contamination areas ~~also for the purposes of decommissioning~~ should be consistent with the principle of optimization of radiation protection.	Words redundancy	x			
260.	Indonesia-5	7.19 (11)	**Access controls should be considered for areas where dose rates can be temporarily high**.	Access controls to high dose area during decommissioning is needed to prevent unnecessary worker exposure.	x			(11) Access controls should be considered for areas where dose rates and/or contamination can be temporarily high.
261.	Israel-10	7.19	Paragraph 7.19 (and as a matter of fact section 7 as a whole) are devoted to issues related to **decommissioning**. Therefore, we suggest to omit the words ~~for example~~ at the end of bullet (4) of paragraph 7.19.	Clarity	x			
262.	Germany-108	7.19	(4) Provision of adequate space in the working areas, to carry out decommissioning~~, for example~~.	Although adequate space should be provided also for other activities, this section is specifically for decommissioning. **Relevance 2**	x			

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
263.	Germany-109	7.19	(6) Use of computer aided design models to optimize decommissioning aspects of the design that affect working times during decommissioning. Video or photographic records and visualisation modelling should be made during the construction of the plant to facilitate the planning of work in areas of high radiation levels during decommissioning and thus to shorten working times.	During the construction of the plant visualization modelling is an option. **Relevance 2**	x			
264.	Marocco-16	7.19	7.19. The design or the revised design for decommissioning should be such that the occupancy time necessary in radiation areas and contamination areas also for the purposes of decommissioning should be consistent with the principle of optimization of radiation protection. This can be achieved, for example, by: (11) Provision of decontamination facilities and storage facilities for radioactive waste of sufficient space.	It should be taken account of, not only the passageways for removing large items of plant and so on and so forth, but also of the area itself where decontamination of contaminated plant items is to be carried out and that should be of sufficient space. This also applies to where the radioactive waste waiting for their removal will be stored.	x			(12) Provision of decontamination facilities and storage facilities with suffitient space for radioactive waste
265.	Germany-110	7.19	10) Provision of a suitable communication system for communication during decommissioning with the site personnel working in radiation areas or contamination areas /zones.	According to para 7.9, decommissioning tasks should also be considered in the identification and classification of areas and zones during the early stage of the design. So mentioning of zones is important here. **Relevance 1**	x			

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
266.	Russia/ SECNRS - 2	7.21	Add new itemThe following measures for reducing radiation exposure during decommissioning should be adopted in the system design in accordance with paras 7.6. (d), (f), (g) and (n) of SSG-47:…- consideration of the possibilities to use the transport and handling equipment, provided in the nuclear power plant design (for operating stage), for dismantling SCCs and waste management during decommissioning.	Para 7.21 contains a list of measures to reduce radiation exposure during decommissioning, which should be taken during the design of nuclear power plant systems. It would be appropriate to include the following provision in this list.		x		Better to put in the para 7.29 ~~:consideration of the possibilities to use the~~ transport and handling equipment, provided in the nuclear power plant design (for operating stage), for dismantling SCCs and waste management during decommissioning
267.	UK-44	7.21	~~Provision of countermeasures~~ (e. g. flushing) to avoid the sedimentation of radioactive sludge in piping and containers used during decommissioning; Methods for dose reduction (e. g. flushing) to avoid the sedimentation of radioactive sludge in piping and containers used during decommissioning;	As per comment on para 5.19, 'Countermeasures' is not a good term to use here. Alternative text suggested.		x		Provision ~~of countermeasures~~ (e. g. flushing) to avoid the sedimentation of radioactive sludge in piping and containers used during decommissioning;
268.	Germany-111	7.21	The following measures for reducing radiation exposure during decommissioning should be adopted in the system design in accordance with paras 7.6. (d), (f), (g) and (n) of SSG-47 [54]:(1) The use of modular construction in order to facilitate the dismantling of SSCs; (2) Facilitation of the removal and/or decontamination of material or equipment, including by means of built-in decontamination mechanisms, such as protective coverings and liners in process cells and areas where liquids might be present; (3) For materials that may be exposed to neutron radiation or materials in contact with reactor coolant, use of	Please check if this list needs actualisation to be in line with SSR 2/1 Rev.1.Additionally, adjustment of wording is recommended. **Relevance 1**		x		Checked with SSR 2/1 Rev.1. wording is accepted

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			materials that are resistant to activation, that are resistant to degradation by chemicals and that have sufficient wear resistance to minimize the spread of activated corrosion products;(4) Consideration of provisions for the installation of 'test specimens ~~coupons~~' to facilitate the radiological characterization of SSCs;(5) Provision of countermeasures (e. g. flushing) to avoid the sedimentation of radioactive sludge in piping and containers used during decommissioning;(6) Development of a ~~W~~waste management concept, especially concerning treatment of radioactive material towards clearance or disposal, and options for logistics;(7) Consideration of provisions for ~~W~~water supply and drainage systems.					
269.	UK-45	7.24	Provisions used for the draining and flushing of tanks to reduce radiation sources for operational states (see para 5.25) should be assessed and if necessary, with additional provisions for decommissioning. This should be in combination with pipework design which ensures that "hold up" points e.g. U-bends are minimized. Ideally systems should self-drain to a low point to enable the system to be completely drained.	Additional text (highlighted) suggested.	x			
270.	Germany-112	7.24	Provisions used for the draining and flushing of tanks to reduce radiation sources for operational states (see para 5.25) should be assessed and if necessary, ~~with~~ additional provisions for decommissioning should be met.	Clarification **Relevance 2**	x			

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271.	Indonesia-6	7.25/1	Recommendations provided in paras 5.27, 5.29 – 5.32 of this Safety Guide should also be applied to component design in Section 7.	Recommendation in para 5.28 is only applicable for operational state.			x	To keep 5.28
272.	Germany-113	7.25	Recommendations provided in paras 5.27 – 5.32 of this Safety Guide should also be applied to component design for decommissioning ~~in Section 7~~.	Statement is not clear, please verify **Relevance 1**	x			
273.	Indonesia-7	7.28/2	During the design stage, identification and reservation of locations for new facilities that might support decommissioning (i. e. new waste management facilities, **dismantling equipment** should be considered (see para. 7.6.(m) of SSG-47 [54]).	To reduce the exposure time for installing the dismantling equipment needed decommissioning.	x			(i.e. new waste management facilities, for dismantling equipment)
274.	UK-46	7.28	During the design stage, identification and reservation of locations for new build facilities and / or the repurposing of existing buildings that might support decommissioning (i.e. new waste management facilities) should be considered as part of the decommissioning strategy (see para.7.6.(m) of SSG-47 [54])..	Additional text (highlighted) suggested to emphasise that existing facilities could be repurposed.	x			
275.	Finland-35	7.29, (1)	Proposed modification: *Protective clothing **(coveralls, extra coveralls, helmets, eye protection, resistant gloves, puncture resistant safety shoes, shoe covers)***	It is not only the shoes that are needed during decommissioning phase.	x			(1) Protective clothing (coveralls, extra coveralls, helmets, eye protection, resistant gloves, puncture resistant safety shoes, boots, shoe covers);

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276.	Germany-114	7.29	The following equipment should be provided and should be available before the start of decommissioning of the plant ~~begins~~: (1) Protective clothing (~~boots~~); …… (10) Emergency equipment (including additional specialised protective clothing, ~~self-powered~~ air samplers with build-in power sources and emergency vehicles);	Clarification **Relevance 2**		x		Editorial
277.	Indonesia-8	7.30/1	Remote techniques (see para. ~~5.33~~ 5.34) may play a major part in the removal of the most radioactive items during decommissioning. The use of such techniques should be considered at the design stage and it should be ensured in the design that their use is not precluded. It is likely that there will be improvements in remote control techniques over the lifetime of the plant and between initial stage and later stages of decommissioning. **The recommendation in para 5.36 should also be considered for decommissioning where access to high dose rate areas prior to and during decommissioning should be avoided as far as practicable by optimizing the use of remote visual inspection equipment used in operational states such as radiation resistant/tolerant cameras.** The best practicable techniques that are available when the work is carried out should be used.	Remote techniques is stated in para 5.34.Equipment for visual inspection used in operational phase is also needed for characterization survey for decommissioning.	x			Remote techniques (see para. V Remote techniques (see para. ~~5.33~~ 5.34) may play a major part in the removal of the most radioactive items during decommissioning. may play a major part in the removal of the most radioactive items during decommissioning. The recommendation in para 5.36 should also be considered for decommissioning where access to high dose rate areas prior to and during decommissioning should be avoided as far as practicable by optimizing the use of remote visual inspection equipment used in operational states such as radiation resistant/tolerant cameras**.**
278.	Germany-115	7.32	When decontamination facilities are being planned, all components that are expected	Comma is missing, otherwise unclear	x			

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			to come into contact with contaminated waste material should be considered, possible items for decontamination during decommissioning as well.	**Relevance 2**				
279.	Indonesia-9	7.34/4	The system of active floor drains should be extended to all rooms where there are systems that contain radioactive fluids during decommissioning. The sumps or the rooms should be provided with liquid level detectors that actuate a high- level alarm, as recommended for the operational states in para. 5.71. **The tank for liquid radioactive waste in the design for operational states should be assessed in decommissioning plan to ensure that any releases of liquid radioactive effluent from decommissioning activities to the environment will remain small as recommended for the operational states in para 5.73.**	The decontamination and dismantling process using water and liquid chemical may generate large volume of liquid radioactive waste.	A			The tank volume for liquid radioactive waste in the design for operational states should be assessed in decommissioning plan to ensure that any releases of liquid radioactive effluent from decommissioning activities to the environment will remain small as recommended for the operational states in para 5.73.
280.	Germany-116	7.34	The system of active floor drains should be extended to all rooms where there are systems that contain radioactive fluids during decommissioning. The sumps or the rooms should be provided with liquid level detectors that actuate a high ~~level~~ priority alarm, as recommended for the operational states in para. 5.71.	Clarification. **Relevance 2**		X		that actuate a high priority ~~level~~ alarm, Paras 4.269 to 4.285 of SSG-62 [30] provide recommendations related to draining system and that also should be considered.
281.	Germany-117	7.36	There should be an adequate tank volume for storage of contaminated water. ~~do not burden systems that are intended for other purposes during decommissioning.~~ The tank volume should also be sufficient ~~to ensure that any releases of~~ for the storage of liquid radioactive effluent resulting	Clarification, as second half of first sentence is not clear.Additionally, please specify "small".	x			

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			from decontamination during decommissioning. It should be ensured that any releases to the environment will remain ~~small~~ within authorized limits.	**Relevance 2**				
282.	Germany-118	7.37 Line 4	… Systems should be provided for decontaminating such surfaces before they dry out and before decommissioning starts. Systems should also be provided for decontaminating~~, before they dry out,~~ fuel transport flasks and components that may have to be removed from the pools for decommissioning before they dry out.	Clarification. **Relevance 2**	x			
283.	Germany-119	7.38	Decontamination facilities during decommissioning should be provided for removing radioactive material from the surfaces of components, ~~and~~ tools and equipment that will be removed from the service.	Editorial **Relevance 3**	x			
284.	Germany-120	7.40	Drains from the decontamination facilities should be designed to connect them to the treatment systems for radioactive effluents during decommissioning as well.	Clarification. These are the same drains as for operation, correct? **Relevance 2**	x			
285.	UK-47	7.41	Plans for removing components of the ventilation system during decommissioning should be also considered and include the capacity to re-balance the system post removal.	Additional text (highlighted) suggested.		x		and include the capacity to re-balance the system after the removal of those particular components.
286.	UK-43	7.41	This should be included in the section on ventilation by addition to section 7.41 for example as follows: 'Specific circumstances that arise during decommissioning (e. g. modification of the	Inclusion of local connection points into the HVAC system used during the operations phase will facilitate radiation protection activities through control of	A			'Specific circumstances that arise during decommissioning (e. g. modification of the ventilation system might be necessary during

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			ventilation system might be necessary during decommissioning) should be taken into account at the design phase. For example, inclusion of local connection points…'	contamination in the working environment. The ability to use existing systems will also minimize additional equipment being brought on to site and generation of waste volumes.				decommissioning) should be taken into account at the design phase. (for example, inclusion of local connection points)…'
287.	Indonesia-10	7.43/5	Both the spread of contamination and the amount of releases to the environment should be limited by providing features such as air cleaning filters and by maintaining appropriate pressure differentials **and the efficiency of filter systems above the design limit**. It should be also considered that decommissioning actions might result in elevated discharges for a limited period of time and might also lead to changes in pressure conditions (see para. 8.21 of SSG-47 [54]). **To ensure that appropriate pressure differentials and the efficiency remains above the design limit, the design should allow for suitable periodic tests and/or ongoing measurements such as sampling the air from upstream and downstream of the filter system, as recommended for the operational states in para 5.60.**	The efficiency of filter system is one of important parameters to ensure the ventilation system performance. Decommissioning process may take a long period of time. Therefore, suitable periodic tests and/or ongoing measurements such as sampling to ensure the performance ventilation system are needed.		x		Both the spread of contamination and the amount of releases to the environment should be limited by providing features such as air cleaning filters and by maintaining appropriate pressure differentials and the efficiency of filter systems within the design specification It should be also considered that decommissioning actions might result in elevated discharges for a limited period of time and might also lead to changes in pressure conditions (see para. 8.21 of SSG-47 [54]). To ensure that appropriate pressure differentials and the efficiency remains efficiency of filter systems within the design specification , the design should allow for suitable periodic tests and/or ongoing measurements such as

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
								sampling the air from upstream and downstream of the filter system, as recommended for the operational states in para 5.60.
288.	Germany-121	7.46	The airflow in the ventilation system used during decommissioning should be such that the airflow in the ventilation system should be directed from regions of lower airborne contamination to regions of higher contamination and air should be extracted from the latter as to minimize the resuspension of contamination ~~(see para 7.44)~~.	Is para 7.44 relevant here / correct reference? Please verify. As we don't see such a relevance (para 7.44 is about another function of ventilation system), suggestion is to delete. **Relevance 2**	x			
289.	Finland-36	7.47	Proposed modification: *Portable ventilation systems (fans, filters and tents) should also be used in areas where airborne contamination may arise during decommissioning, and provision should be made for sufficient space in which to operate such systems.* ***The portable ventilation systems should also be used in areas where dismantling works are producing metal dust and combustion gas to avoid transportation of impurities through the ventilation channels into measurements of radioactive releases to environment.***	Metal dust and combustion gasses could lead to a blockage of the release measurement sampling filters.	x			The portable ventilation systems should also be used in areas where dismantling works are producing metal dust and combustion gas to avoid transportation of impurities through the ventilation channels into measurements of radioactive releases to environment.
290.	Germany-122	7.51	The use of hazardous substances in the design and construction of SSCs that could result in mixed hazardous and radioactive waste during decommissioning should be avoided (see para. 7.6.(k) of SSG-47 [54]).	Clarification **Relevance 2**	x			

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291.	Germany-123	7.53	The design of storage facilities for radioactive waste should incorporate the following functions during decommissioning: …(e) Further design features against incidents and accidents (*see paras 6.54 and 6.55*).	There are no paras 6.54 and 6.55 in current document, please verify **Relevance 2**	x			~~*(see paras 6.54 and 6.55).*~~
292.	Indonesia-11	Line 19	**Protection of the public during ~~plant operation and~~ decommissioning**	This subchapter is only for decommissioning.	x			**Protection of the public during ~~plant operation and~~ decommissioning**
293.	Israel-11	7.61	Similarly, before paragraph 7.61 (also part of section 7 addressing **decommissioning**) we suggest to omit the word operation in the secondary title before paragraph 7.61 (**operation** not being part of **decommissioning**).	Clarity				See Indonesia 11
294.	Indonesia-12	7.65/4	The major sources of contaminated water that require treatment during decommissioning include: primary coolant; floor drains that collect water that has leaked from the active liquid systems and fluids from the decontamination of the plant and fuel flasks; water that is used to backflush filters and ion exchangers; ~~leaks of secondary coolant~~; laundries and changing room showers; and chemistry laboratories. The foregoing sources are essentially aqueous in nature and the guidance that follows is given on this basis. Where non-aqueous liquid waste is generated in sufficient volumes, the provision of a separate waste treatment system to deal with it should be considered. Further guidance on the treatment of	Secondary coolant has been removed before decommissioning start.			R	

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			aqueous and non-aqueous liquid waste is provided in SSG-40 [11].					
295.	Russia/ROSATOM-21	7.65 Line 1	The major sources of liquid waste ~~contaminated water~~ that require treatment during decommissioning include:	See comment 1.			x	To keep: The major sources of contaminated water that require treatment during decommissioning include
296.	UK-48	7.65	The ~~foregoing are~~.... Change to: These are….	Readability	x			
297.	Germany-124	7.67	Consideration should be given to the amount of solid waste that is produced by the liquid waste management systems during decommissioning. The volumes of liquid that require treatment should be reduced as low as reasonably achievable by the careful design of the circuits that contain radioactive water to prevent leakage and by minimizing the potential for the plant to require decontamination during decommissioning. By minimising the production of solid waste t~~T~~he treatment should be appropriate for the level and type of contamination in the water ~~to achieve the required decontamination factors in a way that minimizes the doses to the site personnel and the production of solid waste~~. This should be achieved by segregating the waste from different sources into waste streams.	Clarification. **Relevance 2**	x			
298.	Marocco-17	7.68	7.68. All discharges of radionuclides to the atmosphere should be reduced by the best practicable means and are required to be	We suggest that this part of the sentence be deleted, since the use of dose constraints allow		X		All discharges of radionuclides to the atmosphere should be reduced by the best

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			subject to the applicable authorized limits, ~~including dose constraints~~ and optimization requirements.	appliance of the optimization principle, rather than the limitation of exposure.				practicable means and are required to be subject to the applicable authorized limits and optimization requirements, -including dose constraints.
299.	Indonesia-13	7.69/1	**The system for the management of** gaseous waste should be designed to collect all the radioactive gas that is produced in the plant and to provide the necessary treatment before it is discharged to the environment during decommissioning (see para 5.104).	To be consistent with 7.48 line 3. the term of "management system" in IAEA Glossary has a broader meaning i.e. "A set of interrelated or interacting elements (system) for establishing policies and objectives and enabling the objectives to be achieved in an efficient and effective manner"	x			The gaseous waste management system To check everywhere the management system in other places: 7.70 as well
300.	Indonesia-14	7.74/3	After the potential intensity of the source has been assessed, the process of shielding design for decommissioning should be carried out iteratively, starting with the design of shields without penetrations. ~~Next, consideration should be given to the necessary penetrations through the shielding, such as those for temporary pipes, cables and access ways, and the provision to be made to maintain the effectiveness of the shielding for the protection of site personnel.~~	Because there is subchapter dedicated to "*Penetrations through the shielding during decommissioning*" then this sentence is more suitable in para 7.79	x			To move to 7.79: Next, consideration should be given to the necessary penetrations through the shielding, such as those for temporary pipes, cables and access ways, and the provision to be made to maintain the effectiveness of the shielding for the protection of site personnel.
301.	Indonesia-15	7.79/1	**Consideration should be given to the necessary penetrations through the shielding, such as those for temporary pipes, cables and access ways, and the provision to be made to maintain the effectiveness of the shielding for the protection of site personnel. Penetrations through the shielding introduce**	See comment on para 7.74	x			Consideration should be given to the necessary penetrations through the shielding, such as those for temporary pipes, cables and access ways, and the provision to be made to maintain the

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			pathways by which gamma radiation can propagate preferentially. The basic means of controlling dose rates due to penetrations, point for access by personnel or equipment provided in paras 5.53 - 5.56 are applicable for decommissioning as well.					effectiveness of the shielding for the protection of site personnel.
302.	Germany-125	8 Title	DESIGN ~~FOR~~ OF RADIATION MONITORING FOR OPERATIONAL STATES, ACCIDENT CONDITIONS AND DECOMMISSIONING	Editorial **Relevance 2**	x			
303.	Germany-126	8.2	Elements of the radiation monitoring programmes should include at least the monitoring of the following, as appropriate: *(i) External and internal exposures of workers;(ii) Discharges; (iii) Background radioactivity in the environment; (iv) Other parameters important for the assessment of public exposure (e.g. environmental and meteorological conditions at the site).*	Current list should be the same and should have the same order as further sub-titling in this chapter.Can you please change the order of items respectively?For better understanding, sub-titling in this chapter is the following:1) Area monitoring systems within the plant2) Individual monitoring3) Monitoring of discharges4) Environmental monitoring5) Process monitoring6) Radiation monitoring under accident conditions **Relevance 1**		x		List was supplemented with “Area monitoring systems within the plant” and “monitoring” was added to every point. Full agreement between this list and titles of subchapters is not necessary. Proposal: “Elements of the radiation monitoring programmes should include at least the monitoring of the following, as appropriate: (i) Area monitoring systems within the plant (ii) Individual monitoring including external and internal exposures of workers; (iii) Monitoring of discharges;

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
								(iv) Environmental monitoring including background radioactivity in the environment; (v) Monitoring of other parameters important for the assessment of public exposure (e.g. environmental and meteorological conditions at the site).”
304.	Marocco-18	8.3	8.3. The monitoring plan should include the type of parameters to be monitored, the type of data to be collected, the methodology for data collection (including the location and frequency of data collection), the required resolution and precision of any measurements, the type of equipment used for radiation monitoring, data backup requirements, as well as requirements for data processing and analysis.	The type of equipment used for the measurements is also an information that should be included in the monitoring plan since it is an important input to assess the accuracy of data collected.			x	In several cases different types of equipment could be used and available on the market. Not necessary to specify this in the design phase. “required resolution and precision of any measurements” is mentioned in the text.
305.	Germany-127	8.9	Equipment and systems for performing these monitoring tasks should be provided in the design of a nuclear power plant. The rationale and the design basis for the measurement channels, their measuring ranges and detector locations should be documented. These ~~systems~~ items are subject to national regulatory requirements, and should be designed, implemented, calibrated, tested, maintained, repaired or replaced, inspected and monitored in compliance with relevant national and international codes and standards. They ~~Items important to safety~~	Please adjust wording for clarification.SSG-54 [53] para. 2.115 is not about power outage – please verify this reference; we suggest to delete. Additionally, please remove the last sentence, dealing with IEC and ISO to para 8.12 and place it after mentioning of IAEA Safety Guide SSG-39, if necessary. **Relevance 1**		x		Text was adjusted (proposals not accepted are marked with yellow). Last sentence (originally taken from document NS-G-1.13.) was moved to para 8.12. Proposal: Equipment and systems for performing these monitoring tasks should be provided in the

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			should be redundant to ensure that monitoring is always possible and should have reliable and diverse data communication system with an independent ~~backup~~ power supply that can operate ~~independently~~ autonomously in case of a loss of power ~~for a period consistent with the safety analyses performed in the event of a power outage (SSG-54 [53] para. 2.115).~~ In special cases, it may be necessary to use two or more measuring channels to cover the specified range of measurement. In these cases, the measuring ranges should overlap sufficiently. ~~Basic information on the electrotechnical and radiation measuring requirements for the design of instrumentation and devices is given in the standards of the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO).~~					design of a nuclear power plant. The rationale and the design basis for the measurement channels, their measuring ranges and detector locations should be documented. These ~~systems~~ items are subject to national regulatory requirements, and should be designed, implemented, calibrated, tested, maintained, repaired or replaced, inspected and monitored in compliance with relevant national and international codes and standards. Items important to safety should be redundant to ensure that monitoring is always possible and should have reliable and diverse data communication system with an independent ~~backup~~ power supply that can operate ~~independently~~ autonomously in case of a loss of power for a period consistent with the safety analyses performed in the event of a power outage (SSG-54 [53] para. 2.115). In special cases, it may be necessary to

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
								use two or more measuring channels to cover the specified range of measurement. In these cases, the measuring ranges should overlap sufficiently. ~~Basic information on the electrotechnical and radiation measuring requirements for the design of instrumentation and devices is given in the standards of the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO).~~
306.	Germany-128	8.12	Recommendations regarding instrumentation and control systems, including general recommendations and design guidelines, provided in SSG-39 [32] should be taken into account. Basic information on the electrotechnical and radiation measuring requirements for the design of instrumentation and devices are also given in the standards of the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO).	For clarification and better referencing. But, actually, we think that referencing to IEC and ISO is not necessary in this Safety Guide. **Relevance 2**	x			This sentence was in the original NS-G-1.13. document. Now moved here from para 8.9. Proposal: Recommendations regarding instrumentation and control systems, including general recommendations and design guidelines, provided in SSG-39 [32] should be taken into account. Basic information on the electrotechnical and

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
								radiation measuring requirements for the design of instrumentation and devices are also given in the standards of the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO).
307.	Indonesia-16	8.19/3	Area monitoring **adapted with classification of zones within the controlled area, surface contamination and airborne contamination** includes the measurement of dose rates, activity concentration in air and surface contamination. Passive detectors (e. g. thermo luminescent dosimeters) might be installed for backup and retrospective evaluation of radiation environment.	the requirement of area monitoring for controlled areas to be divided into zones on the basis of the anticipated radiation levels and radioactive contamination levels during decommissioning.		x		Add a new sentence at the end of para: "Elements of the monitoring system should be in line with the anticipated radiation levels and radioactive contamination levels." (for the new version of this para see also next comment)
308.	Russia/ROSATOM-22	8.19	Area monitoring includes the measurement of dose rates, activity concentration in air and surface contamination. Passive detectors (e. g. thermo luminescent dosimeters) might be installed for backup and retrospective evaluation of radiation environment. **Continuous measurements of wind speed and other meteorological parameters shall also be provided,**	For fill scale monitoring and evaluation, it is advisable to monitor weather conditions in monitored areas outside the buildings.		x		8.19 Area monitoring includes the measurement of dose rates, activity concentration in air and surface contamination. Area monitoring should account for the impact of local environmental factors (e.g., monitoring of atmospheric conditions for outdoor activities). Passive detectors (e. g. thermoluminescent

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
								dosimeters) might be installed for backup and retrospective evaluation of radiation environment. Elements of the monitoring system should be in line with the anticipated radiation levels and radioactive contamination levels.
309.	Germany-129	8.20	In the controlled areas, continuously operating fixed instruments with a local alarm and an unambiguous readout should be installed so as to give information on radiation dose rates and airborne contamination in selected areas. ~~Further recommendations on how to ensure the habitability of the main control room in the event of radioactive contamination of the site are provided in para 4.86 of SSG-62 [30].~~To ensure the habitability of the main control room in the event of radioactive contamination of the site, the process radiation monitoring system should monitor the main control room air inlet and actuate the iodine and particulate filters of the main control room ventilation (see paras 4.86 and 4.160–4.167 of SSG-62 [30].)	Please make the statement of this para more precise. **Relevance 1**	x			
310.	Germany-130	8.22	~~External~~ Process ~~-~~radiation monitoring systems should be installed in: — The reactor containment; — The rooms that are adjacent to the upper part (refuelling area) of the containment; — The spent fuel storage facility; — The fuel handling	Is **process** radiation monitoring system meant here, in line with paras 4.74–4.93 of SSG-62? Please verify. Additionally, for Chapter 8 of current Guide it might be of advantage to refer to		x		“External” was deleted. However, these are not only process radiation monitoring systems. Proposal:

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			machine; — The treatment and storage facilities for radioactive waste; — The decontamination facilities; — The transport routes for fuel and waste; — Areas for the handling and storage of fresh mixed oxide fuel or fresh fuel containing reprocessed uranium; — Emergency response facilities.	statements of SSG-62, Chapter "Process radiation monitoring", not only for the case of habitability of the main control room (see para 8.20); can you please verify this matter as well? **Relevance 1**				"~~External~~ Radiation monitoring systems should be installed in: …" Add a new bullet at the end: - outdoor radiation protection monitoring at the site (including dose rate meters outside the buildings). Proposal: 8.22. ~~External~~ Radiation monitoring systems should be installed in: — The reactor containment; — The rooms that are adjacent to the upper part (refuelling area) of the containment; — The spent fuel storage facility; — The fuel handling machine; — The treatment and storage facilities for radioactive waste; — The decontamination facilities; — The transport routes for fuel and waste; — Areas for the handling and storage of fresh mixed oxide fuel

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
								or fresh fuel containing reprocessed uranium; — Emergency response facilities; — Outdoor radiation protection monitoring at the site (including dose rate meters outside the buildings). Germany-130 additional Reason explanation/comment to para 8.22.: Additionally, for Chapter 8 of current Guide it might be of advantage to refer to statements of SSG-62, Chapter "Process radiation monitoring", (…) Add a new sentence to the end of para 8.38: "Recommendations regarding "Process radiation monitoring" described in SSG-62 [30] paras 4.74–4.93 should be considered." Finland-21 comment to para 5.5.: Please consider adding text about minimizing the background radiation levels in those rooms or areas where contamination

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
								monitoring is meant to be done. Recommendation based on the Finland-21 comment on para 5.5: New sentence to the end of Para 8.27: "Background radiation levels in the rooms and areas where contamination monitoring is planned should be minimized or at least considered for decrease the uncertainty of the measurements. (See Ref. para 9.30 of GSG-7)"
311.	Marocco-19	8.29	8.29. Monitoring programmes should be designed to demonstrate that discharges are in compliance with the authorized limits and in order to check the assumptions used to evaluate doses to the representative person, (...)	It is preferable to be more specific to avoid any confusion; Monitoring programs enables indeed to demonstrate compliance with the authorized discharge limits.	x			
312.	Germany-131	8.29	Monitoring programmes should be designed to demonstrate that discharges are in compliance with the limits and in order to check the assumptions used to evaluate doses to the representative person, in accordance with para. 5.75 of GSG-9 [23] and with RS-G-1.8 [67], Environmental and Source Monitoring for Purposes of Radiation Protection.	Please add the title of RS-G-1.8, as mentioned here for the first time. **Relevance 2**	x			Monitoring programmes should be designed to demonstrate that discharges are in compliance with the authorized limits and in order to check the assumptions used to evaluate doses to the representative person, in accordance with para. 5.75 of GSG-9 [23] and with RS-G-1.8 [67], Environmental and Source Monitoring for

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
								Purposes of Radiation Protection.
313.	Finland-37	8.34	Proposed modification:*Methods and tools should be appropriate for measurements in normal operational states, in design basis accident conditions and also in design extension conditions.See also para. 8.3 for decommissioning.*	Please clarify that decommissioning is also considered by a.Environmental monitoring programme should cover the decommissioning phase to assess exposures and other radiological impacts.			x	Decommissioning is dealt with in paras 8.6 and 8.16, not necessary to mention it here.
314.	Germany-132	8.37	The environmental monitoring programme should be established at the pre-operational stage ~~during site characterization~~ (see recommendations provided in ~~NS-G-3.2 [19] and~~ GSG-10 [20]). Further details about environmental monitoring including requirements and operational aspects are considered in RS-G-1.8 [67].	Please put in line with GSG-10, para. 1.19.Please check reference NS-G-3.2, as this document is about "Monitoring programme for surface water and groundwater", and not about the whole environmental monitoring programme, we suggest to delete it here. **Relevance 1**		x		Keep NS-G-3.2, there are useful recommendations in it (proposal not accepted are marked with yellow) Proposal: The environmental monitoring programme should be established at the pre-operational stage ~~during site characterization~~ (see recommendations provided in NS-G-3.2 [19] and GSG-10 [20]). Further details about environmental monitoring including requirements and operational aspects are considered in RS-G-1.8 [67].
315.	Germany-133	8.38	In compliance with Requirement 71 of SSR-2/1 (Rev. 1) [1] process sampling systems and post-accident sampling	Clarification	x			See also resolution of Germany-130

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			systems should be provided for determining, in a timely manner, the concentration of specified radionuclides in fluid process systems, and in gas and liquid samples taken from systems or from the environment, in all operational states and in accident conditions at the nuclear power plant. Radiation monitoring systems and equipment should be implemented in n~~N~~uclear power plants ~~should be fitted with installed radiation measuring systems~~ for monitoring activity concentrations from ~~for~~ process fluids and gases. The purpose of these measurements is to detect fuel failures and the release ~~leakage~~ of radioactive material from or ~~in~~to a process system. e.g by leakages.	**Relevance 2**				
316.	Germany-134	8.46 Line 5	… Special attention should be paid to the habitability ~~occupancy~~ of ~~the main~~ control rooms and the necessary emergency response measures on the site.	There can be more than one control room.To be in line with Requirement 27 of SSR-2/2 (Rev. 1) and for consistency in text. **Relevance 2**	x			
317.	Germany-135	8.47 Line 8	… The response of instrumentation ~~or~~ and other relevant systems at the facility should be adequate for the full range of emergencies, including severe accidents, as approved by ~~agreed with~~ the regulatory body.	Clarification.Alternative - instrumentation and control equipment **Relevance 2**	x			
318.	Germany-136	8.49	A proper assessment should be made of all the possible areas for concentrations of radioactive material within the plant and the releases that may occur as a result of accidents, including the nuclide	Please make clear what instrumentation is exactly referred to in current para.	x			

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			composition of the releases and the expected environmental contamination, to ensure that the design of the monitoring instrumentation is adequate to achieve its purpose, which includes ensuring that it covers the necessary range.	**Relevance 2**				
319.	Germany-137	8.50	The operability of measurement systems should be maintained under specified environmental conditions following accidents. The operational ranges ~~of~~ for temperature, pressure, humidity, vibration and ambient radiation fields at least should be specified.	Clarification. Same is applicable for para 8.13. **Relevance 2**	x			also in para 8.13 8.13. Measurement systems should be designed to maintain their operability under specified environmental conditions. The range of conditions ~~of~~ for temperature, pressure, humidity, vibration and ambient radiation fields at least should be specified. Regarding the radiation field dose, dose rate and at least gamma and neutron radiation should be taken into consideration.
320.	Germany-144	A.3	There is no level for risk or dose below which optimization is not required; however, if it has been reliably demonstrated that further reduction in risk or dose could not be achieved at reasonable societal oder economic costs ~~then~~ attempts on further optimization ~~should not be necessary~~ could be omitted.	Formulation "should not be necessary" is not correct one here; clarification. **Relevance 1**				There is no level for risk or dose below which optimization is not required; however, if it has been reliably demonstrated that further reduction in risk or dose could not be achieved at reasonable societal or economic costs ~~then~~ attempts on further optimization ~~should not be necessary~~ could be omitted.

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
321.	Russia/ROSATOM-23	REFERENCES [72]	[72] ~~LEFAURE, C., Monetary Values of the Person-Sievert — From Concept to Practice: The Findings of an International Survey, Rep. CEPN-R-254, Centre d'Étude sur l'Évaluation de la Protection dans le Domaine Nucléaire, Fontenayaux-Roses (1998).~~ Andresz, S., Jobert, T, Schiber, C. The values and the uses of the reference monetary value of the man.sievert. Results of an international survey. J. Radioprotection 55(3), 2020, pp. 207-214	It is advisable to replace the reference [72] (dated 1998) with a recent one (2020).	x			
322.	Germany-138	REFERENCES [34]	INTERNATIONAL ATOMIC ENERGY AGENCY, Application of the Management System for Facilities and Activities, IAEA Safety Standards Series GS-G-3.1 IAEA, Vienna (2006). (Revision: DS512).	Clarification.Please add **Relevance 2**	x			
323.	Germany-139	REFERENCES [46]	INTERNATIONAL ATOMIC ENERGY AGENCY, Chemistry Programme for Water Cooled Nuclear Power Plants IAEA Safety Standards Series No. SSG-13, IAEA, Vienna (2011). (Revision: DS525).	Clarification.Please add **Relevance 2**	x			
324.	Germany-140	REFERENCES New item	DS508: Assessment of the Safety Approach for Design Extension Conditions and Application of the Practical Elimination Concept in the Design of Nuclear Power Plants	Please add as a new reference. **Relevance 1**	x			[20A]
325.	Germany-141	REFERENCES New item	WS-G-6.1 "Storage of Radioactive Waste"	Please add this reference **Relevance 1**			x	
326.	Germany-142	REFERENCES	SSG-51 "Human Factors Engineering in the Design of Nuclear Power Plants"	Please add this reference	x			[59A],

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		New item		**Relevance 1**				
327.	Germany-143	Annex I	SOURCES OF RADIATION AND SOURCE TERMS IN DIFFERENT PLANT STATES AND THEIR MINIMIZATIONThe accidents presented here are selected for illustrative purposes and cover all the major categories of designs for nuclear power plants with light water reactors, CO_2 cooled reactors with UO_2 metal clad fuel, heavy water reactors and reactors with on-load refuelling.	Add a description to Annex I (in correlation with para 3.3) **Relevance 1**	x			Introductory sentence without numbering The accidents presented here are selected for illustrative purposes and cover all the major categories of designs for nuclear power plants with light water reactors, CO_2 cooled reactors with UO_2 metal clad fuel, heavy water reactors and reactors with on-load refuelling.
328.	Israel-12	General	**General Comment regarding Annex 1:** Would not it be appropriate, for this 35 pages Annex addressing in details the subject of source terms and sources of radiation from NPP's, to present some relevant information/data based on or derived from the Fukushima Dai-ichi accident in 2011? The superseded original document NS-G-1.13 is from 2005 but the present guide is more than ten years "after Fukushima". (There is a single mentioning of the Fukushima accident in the one of the last paragraphs (para I-151 of the Annex (157 paras in total), regarding presence of gaseous iodine along with particulate iodine – addressing to a reference (without the year of its publication), ref. [I-27].	Completeness		x		The Annex is giving an example that was updated. There are other IAEA documents that were published after Fukushima Daichi accident with the information on source terms. ref. [I-27]. Year of publication
329.	USNRC-12	I-20 (pg 111/145)	In water cooled reactors, and particularly in heavy water reactors, tritium is an important source of internal radiation	Balances the statement about cost-effectiveness by	x			and the radiological impacts of these

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			exposure. In light water reactors, tritium as tritiated water is an important source in liquid and gaseous effluents released to the environment since there is currently no cost-effective method for removing it from waste streams and the radiological impacts of these effluents are negligible.	demonstrating the consequence is small				effluents are generaly negligible
330.	Germany-145	I–29	*The composition of liquid wastes (i. e. activity concentration and solid and chemical content) varies according to their origin. It is general practice to segregate and treat liquid wastes according to their expected compositions. The liquids in the liquid waste treatment system therefore have a wide range of activity concentration. The segregation of liquid wastes could be made in accordance with the following categories: .....*	Please make clear if this is a good practice or required by regulation. N.B. Requirements and recommendations on the management of radioactive waste before it is sent to a repository are established in IAEA Safety Requirements and Safety Guides GSR Part 5 [7], SSG-41 [13] and SSG-40 [11]. **Relevance 1**		x		*It is general practice to segregate and treat liquid wastes according to their expected compositions in order to improve the treatment efficiency.* These IAEA publications are referred in the main body of this document n the Annex only references referred that are used for it.
331.	Germany-146	I–37	The total volume of unprocessed waste that arises per year of operation from a 1000 MW(e) nuclear power plant may be as high as a few tens up to few hundred cubic metres, the major part being low level waste. The activity concentration of the waste varies over a wide range, with a small percentage having a maximum activity concentration of the order of 5 × 1016 Bq/m3 for activated components and 5 × 1014 Bq/m3 for ion exchange resins and pre-coat filter material. In most cases, long lived activation products such as 60Co and, when fuel cladding defects have occurred, long lived fission products (particularly	Clarification.Sentence seams to be uncompleted, please verify. **Relevance 2**			x	

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			134Cs and 137Cs) are the major radioactive sources in solid waste.					
332.	Germany-147	I–60	The coolant of some gas cooled reactors contains ~~tritium,~~ 35S in the form of carbonyl sulphide, tritium, and 14C. The 35S is produced mainly from the chlorine impurity in the graphite moderator, the tritium from the lithium impurity in the graphite and 14C from the nitrogen impurity in the coolant and moderator.	We suggest to adjust the order of elements, to make the content more logical. **Relevance 2**	x			
333.	USNRC-13	I-68 (121/145	SOURCE TERM UNDER DESIGN BASIS ACCIDENTS WITH POTENTIAL FOR FUEL DAMAGE	Recommend adding red text. The use of DBA in this title and section seems inconsistent with the assertion earlier in the document (e.g., 2.16) that fuel damage does not occur during a DBA			x	More general
334.	Germany-148	I–70	In the following subsections, examples of methods for determining radiation sources are described for selected design basis accidents. The scenarios are selected for illustrative purposes only and to cover all the major categories of design of nuclear power plants. Not all accident scenarios leading to radioactive releases are discussed here in the same detail. A generalized approach to evaluating the source term from severe accidents is given in Ref. [I–2]. Information about the use of nuclide inventory software for accidents is provided in I-5.	Reference to para providing information about the use of nuclide inventory software for accidents might be useful here. **Relevance 1**	x			Some information about the use of nuclide inventory software for accidents is provided in I-5
335.	Germany-149	I–75	If the location of the steam line break is within the containment, the event sequence ~~of events~~ is similar to that for a loss of	Clarification	x			

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			coolant accidents in Ppressurized water reactors, possibly with a certain fraction of the fuel cladding damage. The conservative fission product inventory for full power operating conditions should be conservatively has to be assumed. The design analysis for the potential radioactive release has to should consider the time needed for containment isolation to take place and the effectivenessity efficiency of the coolant purification system.	**Relevance 2**				
336.	Germany-150	I-76	If the location of the steam line break is outside the containment and the main steam line isolation valves near the containment close immediately close to isolate the reactor, only a fraction of the radioactive material present in the steam under operating conditions willwould be released. Condensation of steam inside the building in which where the break occurs and the plateout of substances other than noble gases, will result in a certain reduction in the amount of the radionuclides that are available for release to be released to the atmosphere. Usually, the release of coolant into a building, other than the containment will cause such an overpressure that radioactive material will be released escape from the building to the environment or to other buildings, either via through predetermined release paths (air or water) through potential release points (usually in the roof) or through doors or other weak structures which will be breached by the overpressure. Mixing	This is only a description of what can happen, but no requirement - what is concluded from that? The concluding requirement in I-78 does only partly cover what is required.“Plateout of substances” is not a term from Safety Glossary, can it be changed to a more common one? **Relevance 2**	x			

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			of the steam with the air in the building may be assumed if the possible pipe break and the ~~escape~~ release points ~~from~~ of the building are not ~~closely~~ located in the close vicinity. After the relief of the overpressure, releases to the ~~outside~~ open atmosphere will not be through uncontrolled release points but via the stack through the ventilation system and filters.					
337.	Germany-151	I-77	In some plants, leakage control systems have been added between the main steam isolation valves to limit the ~~escape~~ release of radioactive material by this path.	This is only a description what can happen, but no requirement - what is concluded from that? The concluding requirement in I-78 does only partly cover what is required **Relevance 2**	x			
338.	Germany-152	I-78	The possibility of direct releases from the building to the environment after the relief of overpressure needs to be considered if the overpressure relief openings will not close *and the underpressure of the building relative to the atmosphere.*	At least a verb is missing for the second part of the sentence. Can you please verify? **Relevance 2**	x			The end of the sentence is missing
339.	Germany-153	I–104 Line 9	… Severe accidents associated with containment by-pass would result in large radioactive releases and thus need to be practically eliminated (Ref. DS508).	Please include references for the application of the practical elimination. The new Safety Guide DS508 is expected be released before the current one. **Relevance 1**	x			DS508 [20A]

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
340.	Germany-154	I–116	Several other phenomena can affect the release of fission products into containment. If the reactor coolant system is at high pressure at the time of failure of the reactor pressure vessel, quantities of molten core materials could be ejected from the reactor pressure vessel into the containment at high velocities which is associated with a significant amount of radioactive material added to the containment atmosphere~~, primarily in the form of aerosols- high pressure melt ejection.~~	Clarification. **Relevance 2**	x			
341.	Germany-155	I–126	Hydrogen combustion also influences the transport phenomena and the convective flow patterns set up in the containment. Resuspension of deposits is another consequence of such energetic phenomena within the containment. Hydrogen explosion can cause severe damage to the reactor building and release all the volatile fission products into the environment. Major hydrogen explosions, potentially leading to loss of containment integrity, belongs to conditions to be practically eliminated, Ref. [I-1] and DS508.	Please include references for the application of the practical elimination. The new Safety Guide DS508 is expected be released before the current one. **Relevance 1**	x			DS508 [20A]
342.	Germany-156	I–136 and I–137	~~I-136. Methods of performing the calculations to determine the primary sources of radiation and the data required can be found, for example, in Ref. [I-20]. Suitable computer codes for implementing the methods, where required, are generally available from the Radiation Safety Information Computational Center, Oak Ridge National Laboratories, Tennessee, USA, Ref. [I-21], and from the OECD/NEA~~	These two paras are too similar, actually equivalent. We suggest to delete one para. **Relevance 2**	x			???

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			~~Data Bank Computer Program Services, Ref. [I-22].~~ I–137. A detailed description of the methods used to calculate the fluence from the radiation sources and the data to be used is given in Ref. [I-20], which contains extensive bibliographies. Where computer codes are required to apply the method, suitable codes are generally available through the Radiation Safety Information Computational Center, Oak Ridge National Laboratories, Tennessee, USA [I-21], or the OECD/NEA Data Bank Computer Program Services [I-22].					
343.	Germany-157	I–142	~~In the case of fast reactors, the secondary coolant circuit enters the neutron flux and it is necessary to evaluate the source terms that are due to corrosion of the secondary circuit.~~ Some of the important phenomena that affect the source term for corrosion products are the following: — Ionic species can precipitate and agglomerate to particles. — These particles circulate in the fluid and are likely to form deposits either within the reactor core or on out-of-flux surfaces. By this process they become activated during circulation or after they have been deposited on in-core surfaces. — Ions and particles can be removed from the primary coolant by the coolant purification system. The effectiveness of this process depends on the flow rate and on the decontamination factors of the filters and the ion exchange columns of the coolant purification system. If any of these factors are too low, the purification system will be ineffective.Because the primary circuit is an	First sentence of this para bears no relation to the further content of the para, please delete. **Relevance 1**		x		Thomas will send new text

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			almost closed and non-isothermal system, the above processes compete with reverse processes: for example, particles and deposits may dissolve.					
344.	Germany-158	I–148	For evaluating the source terms for the purposes of modifying or decommissioning a plant, there is no substitute for the results of the latest 100 measurements that have been made at the same plant at all the relevant dose points, which makes such an evaluation difficult and far from being exact.	Clarification, as para seems to be incomplete, containing no recommendation and no advice. **Relevance 2**	x			
345.	India-4	Annex I: title, Page: 107	SOURCES OF RADIATION AND SOURCE TERMS IN DIFFERENT PLANT STATES, DECOMMISSIONING AND THEIR MINIMIZATION	Contents of Annex-I covers decommissioning aspects also (refer I-3, I-4 and I-47), hence the term 'decommissioning' is suggested to be included.			x	Other topics than Decommissioning
346.	Israel-13a	Sections 1 and 2	A few more "Editorials": Possible inconsistency using abbreviations for **paragraphs**: para para. paras. ….(mainly in the first two sections)	Clarity/Editorial	x			Editorial Editors will check
347.	Israel-13b	Page 97	~~can~~ to be deleted in paragraph A.5 of the Appendix	Clarity/Editorial	x			Editorial
348.	Israel-13c	Page 98	Missing closing brackets for the **parenthesis** in paragraph A.6	Clarity/Editorial			x	Editorial closing brackets is there
349.	Israel-13d	Page 126	~~All~~ to be deleted in paragraph I-97 of Annex 1	Clarity/Editorial	x			Editorial
350.	Israel-13e	Page 142	Year of publication (2014) has to be added to the listing of reference [I-27]	Clarity/Editorial	x			Editorial

	Member State Comment No	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
351.	UK-49	Annex 2	Replace example 1 with table 1 from abstract 105 of the IAEA International Conference on Radiation Safety, Improving Radiation Protection in Practice, Nov 2020.	Example 1 dates from 1996, table 1 dates from 2020.	x			