Master Resolution Table

Revision by amendment of 3 Specific Safety Guides on Nuclear Fuel Cycle Facilities:

DS517-A

SSG-5: Safety of Conversion Facilities and Uranium Enrichment Facilities

STEP 7

COMMENTS BY REVIEWER					**RESOLUTION**			
Comment №	**Country**	**Para/ Line №**	**Proposed new text**	**Reason**	**Accepted**	**Accepted, but modified as follows**	**Rejected**	**Reason for modification /rejection**
1.	BRA01	p.16 Para 5.23 Line No.12	*Geometry of processing equipment.* "The potential for changes in dimensions during operation ~~shall~~ should be considered"	**Coherence with Recommendations.** No reference to SSR-4 Requirements is made. Must change *shall* by *should* and remove the quotation marks.	X			
2.	BRA02	p.17 Para 5.23 Line No.4	*Neutron absorbers.* "When taken into account in the safety analysis, and if there is a risk of degradation, the presence and the integrity of neutron absorbers ~~shall~~ should be verifiable during periodic testing.	**Coherence with Recommendations.** No reference to SSR-4 Requirements is made. Must change *shall* by *should* and remove the quotation marks.	X			

			Uncertainties in absorber parameters ~~shall~~ should be considered in the criticality calculations.~~"~~					
3.	BRA03	p.56 Para 8.32 Line No.4	For enrichment facilities it is required to put in place emergency arrangements (para. 9.94 of Ref. [1]) for criticality incidents, which are the only events in which a high external dose rate would be encountered.	Adherence to SSR-4. Requirement. Since there is no direct reference to emergency arrangements for criticality incidents in SSR-4, we suggest to cite para 9.94 of SSR-4: "radiological consequences shall be kept low (…) by implementation of the arrangements provided for in the emergency plan."	X			
4.	BRA04	5.15 / 6	….conditions) (Requirement 57 of SSR-4 [1]).	Include the SSR-4 requirement applied to operational limits and conditions.	X			
5.	BRA05	5.41 / 3	….shielding (Requirement 36 of SSR-4 [1]).	Include the SSR-4 requirement applied to protection against external exposure	X			
6.	BRA06	5.50 /6	…. protection (Requirement 22 of SSR-4 [1]).	Include the SSR-4 requirement applied to the analysis of fire and explosion.	X			

7.	BRA07	5.50 / 10	(b)	Correction of the item identification.	X			
8.	BRA08	5.50 / 11	(c)	Correction of the item identification	X			
9.	BRA09	Annex II Pg 73/92	Figure with bad lower resolution	This same figure should be incorporated, with good lower resolution, directly in the manuscript	X			
10.	BRA10	Annex II Pg 74/92	Figure with bad lower resolution	This same figure should be incorporated, with good lower resolution, directly in the manuscript	X			
11.	BRA11	Annex III	Include in the table: Ventilation System	Considering Fire accident, releases, and degradation of criticality safety margin in the installation.		X		Even though the ventilation system is required to be designed and constructed in a way to minimize the spread of a fire or the inadvertent accumulation of fissile material, the ventilation system itself is not relied upon to prevent a criticality or mitigate the consequences of a fire. Therefore, for these two

								types of accidents, it is not be considered as an SSC important to safety. It is noted that the text in the guide addresses how the design of the ventilation system should address inadvertent accumulation of fissile material and minimize the spread of fires.
12.	CAN01	SSG-5, Para 5.17	Technical: Add text in blue, as follows: 5.17. If a conversion (or deconversion) facility processes natural or depleted uranium, criticality safety would not need to be taken into consideration. For further guidance see the exemption criteria in para 6.138 of SSR-4 and para 2.8 of SSG-27 [2].	The most important guidance is provided in the IAEA standard SSR-4; thus, it needs to be references along with that in SSG-27.		X		The proposed provision refers to guidance, however SSR-4 is requirements level documents. Reference to requirement 38 added to 5.16.

13.	CAN02	SSG-5, Para 5.20, 5,21, 5.22, 5,23, 5.62, 8.48	Editorial: No new text is proposed. See column "Reason" and adjust text accordingly.	In the draft, the following three different terms are used to characterize the same process: "criticality safety analysis", "criticality analysis" and "criticality safety assessment". For consistency of terminology throughout the guide, one term should be selected and used. As per consensus of the criticality safety experts, criticality safety analysis was decided to be a specific reference to the numerical calculations, coding, etc.; whereas, the criticality safety assessment includes the crit. analysis as well as all other aspects (identification of normal and credible abnormal conditions, process description, etc.).	X			
14.	CAN03	SSG-5, Para 5.21	Editorial: Change text in blue as follows: The calculated value of keff (including all uncertainties and biases) is then compared with the value specified by the design limit (which should be set in accordance with Paras ~~2.4 – 2.7~~ 2.8-2.11 of SSG-27 [2])	Outdated links are provided: in current draft of SSG-27, the proper paras are 2.8-2.11		X		Additional provision added, references cannot be made to draft revisions. References will be updated after SSG-27 rev. approval.
15.	CAN04	SSG-5, Para 5.95	Technical. Restore old text as follows: (1) ~~Criticality control:~~I&C relating to criticality safety	The old text (from the published guide) is more accurate than the new text. Namely, out of two bullets that follow the new title 'Criticality control', the first one (Radiation detectors) belongs to	X			

				an accident detection& alarm, and not to a control.				
16.	CAN05	SSG-5, Para 5.95	Technical. Modify text as follows: Radiation detectors (gamma and/or neutron detectors), with audible and, where necessary, visible alarms for initiating immediate evacuation from the affected area, shall cover all the areas where a significant quantity of fissile material is present, ~~unless it can be demonstrated that a criticality accident is highly unlikely to occur,~~ see requirement in Para 6.173 of SSR-4	The terminology and technical content of the text (suggested for deletion) is in contradiction with requirement of Para 6.173 of SSR-4, and with national standards or regulations; see, for example, CNSC regulatory document REGDOC-2.4.3, REGDOC-2.4.3 Nuclear Criticality Safety chapter 3 or ANS/ANSI-8.3 standard.		X		Reference to the corresponding requirement made not to paraphrase the requirement.
17.	CAN06	SSG-5, Para 5.114	Technical. Modification of the text is needed to address the comment in column "Reason" Analysis of design extension conditions should also demonstrate that the conversion facility or uranium enrichment facility can be brought into the state where the confinement function and subcriticality can be maintained in the long-term (see also Ref. [2]).	Reference to SSG-27, ref [2], is included at the end of the sentence. The reference does not make sense since SSG-27 does not contain term "design extension condition" because the term is not applicable and is not used there. Fundamental criticality safety requirement specified in SSR-4 is to ensure subcriticality under normal and credible abnormal conditions. As evident from paras 6.44, 6.45, 6.47, requirement 16, para 6.50, requirement 19 and para 6.168 c) of SSR-4, term 'credible' defines the range of all operational states, accidents and conditions that are considered in non-criticality safety analysis and design – that is, normal operations, AOO, DBA and DEC. Thus, qualitatively or	X			

				quantitatively (i.e. in terms of frequency of occurrence), the range of credible abnormal conditions is the same as that of normal operations, AOO, DBA and DEC. Hence, an equivalent of DEC is already required to be considered in criticality safety, but with the opposite intent -- to ensure subcriticality, (i.e. to prevent an accident) rather than to mitigate its consequences.				
18.	CAN07	SSG-5, Para 8.16	Editorial. Change text as follows: When maintenance is performed on installation that may contain enriched uranium or near a storage location of enriched material, criticality safety ~~personnel~~ staff should be consulted before the work commences.	To make terminology consistent with that of SSR-4, paras 9.23-9.24 and SSG-27.	X			
19.	CAN08	SSG-5, Para 8.48	Editorial: The control of the enrichment level should be such that deviations that could lead to enrichment above the maximum enrichment used in criticality safety analysis No new text is proposed. See column "Reason" and adjust text accordingly.	Same as comment 2: In the draft, the following three different terms are used to characterize the same process: "criticality safety analysis", "criticality analysis" and "criticality safety assessment". For consistency of terminology throughout the guide, one term should be selected and used. As per consensus of the criticality safety experts, criticality safety analysis was decided to be a specific reference to the numerical calculations, coding, etc.; whereas, the criticality safety assessment includes the crit. analysis as well as all other aspects	X			

				(identification of normal and credible abnormal conditions, process description, etc.).				
20.	FIN01	General	Fundamental safety functions are defined in IAEA glossary. Main safety functions are not defined and understanding of main safety functions may vary.	Consistent terminology should be used throughout safety standards especially for key expressions.			X	Main safety functions are defined in Requirement 7 of SSR-4
21.	FIN02	Throughout the document	Correct the notation for chemical compounds to use superscripts or subscripts for the numbers (eg.UF_6 or ^{235}U)	Consistency with other sections, and clarity	X			
22.	FIN03	5.9 and 5.13	The first four types of events ((a)–(d)) are of major safety significance as they might result in chemical and radiological consequences for on-site personnel. However, they may also result in some adverse off-site consequences for public or the environment	Clarity: one thing in one sentence makes it easier to read and understand.	X			
23.	FIN04	5.18/bullet 2	… vessels, control of slabs and appropriate distances in and between storage vessels; the loss of confinement/geometry due to leaks or breaks should also be accounted for	addition	X			
24.	FIN05	5.18/bullet 4	… should be designed for the maximum authorized enrichment level including a reasonable/an appropriate safety margin.	addition	X			
25.	FIN06	5.39	The design should also provide for the monitoring of the source of releases (air emissions and liquid effluents). The design should also provide for monitoring of the receiving environment around the facility and the identification of breaches. The monitoring of the breaches should	The sentence is too complicated and thus very hard to understand. Especially, the end of the paragraph. In the last sentence, what should precede the end: '… and the impact to the environment and the public'. Please, use one thing in one sentence		X		See the modified text

			confirm that there is no breach of containment barriers and thus no impact to the environment or the public.					
26.	FIN07	5.50	Fire hazard analyses should at least be carried out for: (a) high-risk fire sources such as centrifuges; (b) combustible materials (including low voltage cables); (c) safety equipment which should be protected.	Correct the numbering of the items specified	X			
27.	FIN08	5.78	Hazards from external fires and explosions could arise from various sources in the vicinity of conversion facilities or enrichment facilities, such as petrochemical installations, forests, pipelines ~~and~~ road, rail or sea routes used for the transport of flammable material such as gas or oil, and volcanic hazards.	Please reconsider the place of the word 'and' in the list. The clarity might also need some reordering of the items in the list.	X			
28.	FIN09	8.34	8.34. The risks of exposure of members of the public should be controlled by ensuring that, as far as reasonably practicable, radioactive material is removed from ventilation exhaust gases to prevent its being discharged to the atmosphere. 8.35 The monitoring results from the radiation protection programme should be compared with the operational limits and conditions, and corrective actions should be taken if necessary. Furthermore, these monitoring results should be used to	Dividing the paragraph into two would make it clearer as there are two completely different requirement or recommendation.	X			

			verify the dose calculations made in the initial environmental impact assessment.					
29.	FIN10	8.48, bullet 3	… checks should be undertaken to ensure that no hydrogenous material is present in the cylinder (e.g. water, oil, rubber or plastics);	materials rich in hydrocarbs are equally important in controlling criticality as water	X			
30.	FIN11	Ref[2]	SSG-27 is under review, if published before this one, the reference should be updated.		X			
31.	FRA01	5.110	Analysis of Design extension conditions 5.110. The safety analysis should also identify design extension conditions followed by an analysis of their progression and consequences in accordance with Requirement 21 of SSR-4 [1]. The objective is to analyse additional accident scenarios to be addressed in the design of a conversion or uranium enrichment facilities to ensure that the design is such that, for design extension conditions, off-site protective actions that are limited in terms of times and areas of application shall be sufficient for the protection of the public, and sufficient time shall be available to take such actions. Moreover, the possibility of conditions arising that could lead to early releases of radioactive material or to large releases of radioactive material is practically eliminated…	In accordance with SSR-4, the objective of analysis of DEC is to demonstrate that the consequences are limited (according to the additional text "copy/paste" from SSR-4). Practical elimination is a specific approach	X			
32.	GER01	3.19	Paragraph to be added: VERIFICATION OF SAFETY (cf. revision of SSG-7, 3.20-3.22)	According to requirement 5 of SSR-4, the adequacy of the design of any kind of nuclear fuel cycle facility should be			X	Section 3 includes Verification of

				verified. The addressed paragraph should be considered for both conversion facilities and uranium enrichment facilities, as well. Corresponding system- specific aspects should be adjusted.				safety. No further specific guidance for conversion facilities and enrichment facilities was suggested by experts. The paragraph in SSG-7 was drafted in line with graded approach. We believe it is fine not to have in in SSG5.
33.	GER02	3.7 first item	… of management necessary to achieve the safety objectives of the operating organization….	Clarification	X			
34.	GER03	3.7 second item	… that the resources essential to the implementation of safety strategy and the achievement of the safety objectives of the operating organization…	Clarification	X			
35.	GER04	3.7 third item	…to achieve the safety goals of the organization.	Clarification	X			
36.	GER05	5.30 et seqq.	Protection of personnel etc.	Add a new paragraph with the corresponding references to Requirement 8 and para. 6.6 – 6.7 in SSR-4 (radiation protection during design), GSR Part 3 and GSG-7 (consistent with para. 8.31 of this document).		X		Reference to requirement 8 added, SSR-4 refers further to GSR Part 3.

37.	GER06	5.41	Relevant requirements on design provisions for protection against external radiation exposure are listed in Requirement 36 and the subsequent paras. of SSR-4 [1]. External exposure ~~can~~ should be…	Consistency.	X			
38.	GER07	5.85		The headline states “Snowfall and ice storms” while in the paragraph only snow is mentioned. Please extend the para. also to ice storms.	X			
39.	GER08	8.24	… should include a standard process for all modifications (see para. ~~3.14~~ 3.15).	Wrong reference.	X			
40.	GER09	1.6	~~The guidance provided supplements m~~More detailed guidance is provided in the IAEA Safety Standards Series No. SSG-27, Criticality Safety in the Handling of Fissile Material [2].	Sentence not clear.	X			
41.	GER10	5.1	Main safety functions i.e. the functions against the loss ~~of~~ which may lead to releases of radioactive material or chemical releases having possible radiological or associated chemical consequences for personnel, the public or the environment, are provided in Requirement 7 of SSR-4 [1].	Sentence not clear.			X	The sentence with word “against” would not be correct.
42.	GER11	8.2	The safety committee in a conversion facility or an enrichment facility, as defined in SSR-4 [1], para. 4.29, should emanate ~~be developed~~ from the safety committee established for commissioning.	Clarification		X		“created”
43.	GER12	9.2	Special procedures should be implemented during the preparatory works for decommissioning to ensure that criticality control is maintained when	Sentence not clear. What type of equipment could become critical?		X		“equipment containing nuclear material which

			handling equipment whose criticality is controlled by geometry.					criticality safety is controlled by geometry”
44.	IND01	2/1.5	This Safety Guide provides recommendations on meeting these requirements for conversion facilities or uranium enrichment facilities during their siting, design, construction, commissioning, operation and preparation for decommissioning	The safety guide provides requirements during construction phase also.	X			
45.	IND02	5/2.5	Suggestion: Some examples of ‘Certain Accidents’ as mentioned in 2.5 may be provided. Conversion facilities and enrichment facilities do not pose a potential radiation hazard with the capacity to cause an accident with a significant off-site release of radioactive material (in amounts equivalent to a release to the atmosphere of 131I with an activity of the order of thousands of terabecquerels). However, certain accident conditions involving hazardous chemicals can potentially result in adverse off-site consequences.	Examples are desirable	X			
46.	IND03	10/4.3	The density of population in the vicinity of a conversion facility or an enrichment facility and the direction of the prevailing wind at the site should be considered in the site evaluation process to minimize any possible health consequences for people in the event of a release of hazardous chemicals. The environmental	The releases and its impact on public and environment (under normal operation and postulated accident scenarios) should meet the applicable criteria specified for radiological and chemical impact	X			

			impact from the facility under all plant states should be evaluated and should meet the applicable criteria.					
47.	IND04	46/5.141	In line with Requirement 32 of SSR-4 [1], the design of facility should take into account the ageing effects and degradation mechanisms of systems, structures and components important to safety to ensure their reliability and availability during the lifetime of the facility.	Consideration of degradation mechanisms is necessary in ageing management.	X			
48.	IND05	46/5.143	An ageing management programme should be implemented at the design stage to allow anticipating equipment replacements, and effectiveness of the ageing management programme should be assessed periodically by implementing Ageing Management Review programmes.	Implementation of AMR evaluates effectiveness of existing AMPs and facilitates requirements of new ones.		X		Effectiveness of the ageing management programme should be reviewed and assessed periodically.
49.	IND06	31/5.83	If safety limits for humidity or temperature are specified in a building or a compartment, the air conditioning system should be designed to perform efficiently also under extreme hot or wet weather conditions. For structures without expansion joints, the additional loads to due thermal expansion on structural systems shall be considered in the design.	For accounting for loads due to thermal expansion		X		“shall” changed to “should”

50.	IND07	53/8.22	The aging management programme should consider the technical as well as the non-technical aspects of ageing. Ageing management Review Programme should be adopted to assess effectiveness of individual plant Ageing Management Programmes (AMP) identified for specific structures, systems or components.	Appropriateness of individual plant AMP is assessed through effective conduct of AMR for the SSCs identified to be subjected under plant AMPs.		X		See the modified text
51.	JPN01	General	Three Guide publications concerning fuel cycle facilities are going to be revised simultaneously. These three draft standards presented have the same table of contents, that is, each stage of facility lifetime as well as general safety recommendations and management system. This means basic recommendations such as “general safety recommendations” and “management system” should have almost the same description, with due consideration to facility specific characteristics. Section 4 on site evaluation also seems to apply to this as well. However, some descriptions are different from each other, for example, para 2.1 of DS517A(rev. SSG-5) and DS517B(rev. SSG-6) focus on hazards, while DS517C(rev. SSG-7) on safety objectives. Another example is found in section 3, that is, DS517C have paragraphs on “verification of safety”, while other two drafts do not have it. These cases show that the three drafts are not coordinated with each other in preparing the draft. Especially, DS517B and DS517C will be combined in future in accordance with the Long-term Structure of the IAEA Safety Standards, and the revision of these two document are required to have equivalent descriptions as long as possible. So, it is suggested that those recommendations other than ones depending on specific characteristics of each facility should have identical text and format. We have some comments on each draft regarding to this aspect.			X		Sections 2.1 were harmonized. In general, harmonization between the three safety guides is achieved as much as possible and where practicable. Certain differences, however, may remain.
52.	JPN02	General	There are many cases that appropriate messages do not appear for guide level document. Some are simply referred to the requirements established in SSR-4 and do not present useful message as recommended practices. Furthermore, there are many information text without any recommendations. One example on DS517A is shown below. These paras just show relation of another publication and does not add any value as recommendations. Specific engineering design guidance			X		Yes, this is true, however not necessarily wrong. Safety Guides are built to provide useful guidance

			5.4. The requirements on maintaining subcriticality are established in Requirement 38 and paras 6.138 – 6.156 of SSR-4 [1]. Further guidance on the design of conversion facilities and uranium enrichment facilities to ensure subcriticality is provided in Section 3 of SSG-27 [2]; 5.5. The requirements on confinement for the prevention of releases that might lead to internal exposure and chemical hazards are established in Requirements 34 and 35 and the following paras. of SSR-4 [1]; 5.6. The requirements on protection against external exposure are established in Requirement 36 and following paras. of SSR-4 [1]. Shielding should be considered for processes or areas that could involve sources of high levels of external gamma radiation, such as reprocessed uranium or newly emptied cylinders (e.g. exposure to daughter products of 232U and 238U). Another example on DS517C is shown below. These paras just show relation of another publication that is only information 5.2. The requirements on maintaining subcriticality are established in requirement 38 and para. 6.138 – 6.156 of SSR-4 [1] 5.3. The requirements on confinement and cooling of radioactive materials are established in requirements 35, 39 and in para. 6.123 – 6.128 and 6.157 – 6.159 of SSR-4 [1]. Further guidance on the design of a MOX fuel fabrication facility to ensure subcriticality is provided in Section 3 of SSG-27 [4]. 5.4. The requirements on protection against radiation exposure are established in requirement 36 and para. 6.129 – 6.134 of SSR-4 [1]. Owing to the radiation fields associated with plutonium (neutron emissions and gamma radiation), an appropriate combination of requirements on source limitation, distance, time and shielding is necessary for the protection of personnel in respect of whole body exposures and exposures of the hands. For neutron emissions, a general design principle is to place the shielding as close as possible to the source. In some cases, remote operation should be considered if necessary. There should be individual monitoring of neutron doses for personnel in addition to individual monitoring of gamma. So, it is suggested that those paragraphs should add useful recommendations to be performed by users with using “should” statement, instead of just referring to requirements or relevant paras of another safety standard. We have the same comments on each draft regarding to this aspect.					including references to relevant requirements and other existing guidance documents. We try to avoid duplication by copying or paraphrasing existing provisions from already existing publications.
53.	JPN03	1.2. /L8	In addition, for enrichment facilities and conversion facilities that process uranium	Enrichment is more appropriate than concentration for 235U.				

			with a ~~235~~^{235}U ~~concentration~~ enrichment of more than 1%, criticality can also be a significant hazard.	It also the same in paras. 1.5, 2.2, 2.3, and so on.				
54.	JPN04	1.5.	The safety requirements applicable to fuel cycle facilities (i.e. facilities for uranium ore processing and refining, conversion, enrichment, deconversion, reconversion, fabrication of fuel including uranium and plutonium mixed oxide fuel, storage and reprocessing of spent fuel, associated conditioning and storage of waste, and facilities for the fuel cycle related research and development) are established in SSR-4 [1].	Completeness. As "deconversion" is described in 5.17 and 8.70, “deconversion” should be included in SCOPE of para. 1.5. For information, there are several deconversion facilities in Tricastin (France), Capenhurst (UK), Portsmouth(USA) and Paducah (USA). This description is commonly appeared in three draft documents, and addition of “deconversion” is also proposed in other two draft documents (DS517(Rev. SSG-6) and DS517(Rev. SSG-7).		X		Techncially we agree with inclusion of “deconversion ”, this was ensured by adding “reconversion” which is more general and technically correct.
55.	JPN05	3.14.	The management system of uranium conversion or enrichment facilities should include also management for criticality safety. …	Management for criticality safety is also applied to conversion facilities, which is appeared in paras. 1.6 and 5.4.		X		uranium conversion (if applicable) and uranium enrichment facilities
56.	JPN06	4.1.	Requirements for site evaluation for ~~fuel fabrication facilities~~ a conversion facility or an enrichment facility are provided in IAEA Safety Standards Series No. SSR-1, Site Evaluation for Nuclear Installations [10] and further guidance is provided in IAEA Safety Standards Series No. SSG-35, Site Survey and Site Selection for Nuclear Installations [11].	Typo. This DS517A is not for fuel fabrication facilities, but for conversion facilities and enrichment facilities.	X			
57.	JPN07	4.3.	The density and distribution of population in the vicinity of a conversion facility or an enrichment facility and the direction of the prevailing wind at the site should be	Completeness. In the site evaluation, in addition to the hazardous chemicals, the release of radioactive substances is also included.	X			

			considered in the site evaluation process to minimize any possible health consequences for people in the event of a release of radioactive material and hazardous chemicals.					
58.	JPN08	5.9.	The first four types of events ((a)–(d)) are of major safety significance as they might result in chemical and radiological consequences for personnel however may also result in some adverse off-site consequences for public or the environment. Criticality accident on the list would generally be expected to result in limited or no off-site consequences unless the facility is in close proximity to occupied areas.	Clarification. The expression "the last type of accident" is not clear.	X			
59.	JPN09	5.12. (a)	(a) The rupture of an overfilled cylinder during heating (~~input~~ feed area);	A better wording	X			
60.	JPN10	5.12. (d)	(d) Natural phenomena such as earthquakes, flooding or tornadoes (see footnote 1);	"footnote 1" is not found. Suggested to be added, otherwise, be deleted.	X			
61.	JPN11	5.13.	These hazards would result primarily in radiological consequences for on-site personnel~~l~~, however may also result in some adverse off-site consequences for ~~people~~ public or the environment.	Align with the term in Para 5.1 and Requirement 7 of SSR-4.	X			
62.	JPN12	5.16.	The following paragraphs highlight some of the main elements that are specific for facilities covered by this Safety Guide. There are other topics related to criticality safety that are relevant for conversion or enrichment facilities and are not adequately covered by this Safety Guide.	Criticality safety in conersion facilities is also addressed in paras. 1.6 and 5.4.	X			

			The principal guidance is obtained in SSG-27 [2].					
63.	JPN13	5.17.	If a conversion (or deconversion) facility processes natural or depleted uranium of less than 1% ^{235}U enrichment, criticality safety would not need to be taken into consideration. For further guidance see the exemption criteria in para 2.8 of SSG-27 [2].	Clarification of depleted uranium that does not require consideration of criticality.		X		Both natural and depleted uranium have enrichment below 1% by definition
64.	JPN14	5.23./1st bullet	*Mass.* The mass margin should be more than 100% of the maximum value attained in normal operation (to compensate for possible 'double batching', i.e. the transfer of two batches of fissile material instead of one batch in a ~~fuel fabrication~~ process) or equal to the maximum physical mass that could be present in the equipment. (see also para. 3.17 of SSG-27 [2])	This concerns a conversion facility or an enrichment facility.	X			
65.	JPN15	5.23./5th bullet	*Reflection.* Full water reflection should be assumed in the criticality analysis unless it is demonstrated that the worst-case conditions relating to neutron reflection (e.g. by human ~~being~~bodys, organic materials, wood, concrete, steel of the container) result in a lower degree of reflection.	A better wording.	X			
66.	JPN16	5.23./6th bullet	*Neutron absorbers.* … Absorber parameters include thickness, density and isotopic ~~concentration~~ composition.	A better wording.		X		Nuclide composition
67.	JPN17	5.49.	~~(2) For gaseous diffusion enrichment facilities:~~ ~~(a) Areas with high fire loads, such as areas containing lubricating oil tanks and vessels containing degreasing or~~	An appropriate order. In the last sentence of para. 1.5, there is a statement that centrifuge process is the main subject and it is also applicable to gaseous diffusion process.			X	The comment is right, the text unified both technologies.

			~~decontamination solvents; (b) The storage areas for reactive chemicals (e.g. ClF3, F2);~~ ~~(c) Diesel storage tanks;~~ ~~(d) Transformers and rooms housing battery chargers;~~ ~~(e) Areas storing combustible waste prior to its conditioning;~~ ~~(f) Control rooms.~~ ~~(3) For gas centrifuge enrichment facilities:~~ ~~(a) Diesel storage tanks;~~ ~~(b) Transformers and rooms housing battery chargers;~~ ~~(c) The storage of solvents (e.g. methylene chloride CH2Cl2);~~ ~~(d) Areas storing combustible waste prior to its conditioning;~~ ~~(e) Control rooms.~~ (2) For gas centrifuge enrichment facilities: (a) Diesel storage tanks; (b) Transformers and rooms housing battery chargers; (c) The storage of solvents (e.g. methylene chloride CH_2Cl_2);	Except for this para., the order of explanation is consistent.				

			(d) Areas storing combustible waste prior to its conditioning; (e) Control rooms. (3) For gaseous diffusion enrichment facilities: (a) Areas with high fire loads, such as areas containing lubricating oil tanks and vessels containing degreasing or decontamination solvents; (b) The storage areas for reactive chemicals (e.g. ClF_3, F_2); (c) Diesel storage tanks; (d) Transformers and rooms housing battery chargers; (e) Areas storing combustible waste prior to its conditioning; (f) Control rooms.					
68.	JPN18	5.49. (3)	As an important aspect of fire hazard analysis, areas of the facility that require special consideration should be identified. Special fire hazard analyses should be carried out as follows: … … … (3) For gas centrifuge enrichment facilities: (a) Diesel storage tanks; (b) Transformers and rooms housing battery chargers; (c) The storage of solvents ~~(e.g. methylene chloride CH_2Cl_2)~~;	CH2Cl2 itself is not flammable, so delete "(e.g. methylene chloride CH2Cl2)" or change to another example.	X			

69.	JPN19	5.50./L5	Fire hazard analyses should at least be carried out for: (a) high-risk fire sources ~~such as centrifuges~~; (b) combustible materials (including low voltage cables); (c) safety equipment which should be protected.	There is no need to specifically describe that a centrifuge operated near room temperature has a high fire risk. If an example is given, a more appropriate one needs to be given. In that sense, a diffuser operating at a higher temperature may be at higher risk.		X		"diffusers" added, however "centrifuges" left, this was experts' agreement, and it is only an example
70.	JPN20	5.55./L3	In particular, "the installation of automatic firefighting devices with water sprays shall should be assessed with care for areas where UF_6 is present, with account taken of the potential risk of HF generation and criticality events for enriched ~~material~~ uranium.	Appropriate term.	X			
71.	JPN21	7.4.	The licensing documentation (safety ~~case~~ analysis report) should address the remedial actions necessary for the facility, including the items identified above to return to a safe operational state, unless the likelihood of an extended loss of power can be ruled out on probabilistic grounds.	Safety analysis report is generally used. The same comment is on para. 7.4.	X			
72.	JPN22	5.71. /5th bullet	• Loss of steam or hot water supply may result in the solidification of UF_6 in the piping and equipment ~~in a diffusion facility~~.	This original text is true, however it is not appropriate that this item is applied only to diffusion. In some case, solidification may occur in centrifuge system.	X			
73.	JPN23	5.77. (e)	(e) The effect on criticality safety functions such as geometry and/or moderation of the following: • Deformation (geometry control);	Clarification of being a "neutron" poison.	X			

			• Displacement (geometry control, fixed neutron poisons); Loss of material (geometry control, soluble neutron poisons).					
74.	JPN24	5.83./ 2nd and 3rd bullet	• The freezing of the cooling system used in desublimers (cold traps) such as ~~•~~ those used in off-gas systems;	Typo. There is an unnecessary line break between “such as” and “those used in off-gas systems”.	X			
75.	JPN25	5.86./L1	For flooding events, attention should be focused on potential leak paths (containment breaks) into ~~active cells and~~ structures, systems and components important to safety at risk of damage.	Aren't there active cells at the conversion or enrichment facility?	X			
76.	JPN26	5.95. (8)	(8) Control of asphyxiants ~~asphyxiates~~: ・Presence and concentration of asphyxiants ~~asphyxiates~~ (such as N_2, NOx, NH_3 etc) in working areas where it might impact operational safety should be measured.	Typo.	X			
77.	JPN27	5.103.	The ~~risk~~ safety assessment of the conversion facilities and enrichment facilities should include the safety analysis of the variety of hazards for the whole facility and all activities. The safety analysis for the facility will provide the information required for the risk assessment. The IAEA Safety Standards Series No. GSR Part 4 (Rev. 1), Safety Assessment for Facilities and Activities [13] requires that all credible postulated initiating events shall be assessed.	To keep a consistency with the Safety Glosssary. Paras. 5.103. to 5.118. are under the subject of SAFETY ANALYSIS. In accordance with the Safety Glossary (2018) p.20, “Safety Analysis” is part of the safety assessment. There are deterministic and probabilistic methods in “Safety Analysis”, and the latter is related to risk assessment. In p.25 of the Glossary (2018), safety assessment normally includes risk assessment.		X		
78.	JPN28		(1) Calculations of the source term should use: (i) the material with the highest	Appropriate term.	X			

		(1) (i)	specific activity for an isotopic ~~mixture~~ composition;					
79.	JPN29	5.109. (1)	(1) A design basis accident ~~DBA~~ approach which involves an enveloping case (e.g. the release of liquid UF_6 from a cylinder filled to the maximum fill limit), and where account is taken only of those safety features explicitly relied upon to prevent the accident or to mitigate the consequences of the accident~~s~~ and/or reduce its likelihood.	The term "DBA" appears first in this document, then suggested full spelling be used. In addition, this sentence is complicated and difficult to understand, so please change it to a simpler expression.	X			
80.	JPN30	5.109. (1)	A DBA approach which involves an enveloping case (e.g. the release of liquid UF_6 from a cylinder filled to the maximum fill limit), and where account is taken only for ~~of~~ those safety features explicitly relied upon to prevent the accident or to mitigate the consequences of the accident and/or reduce its likelihood.	Typo.	X			
81.	JPN31	5.139.	A large aircraft crash on the storage area for UF6 cylinders is generally not considered as a design basis accident, ~~(~~However this scenario may need to be considered in the design extensions conditions analysis).	It seems that it is not good to put the guide text in parentheses.	X			
82.	JPN32	Chapter 8	8.1. The distinctive features of a conversion facility or an enrichment facility described in para 2.1 should be taken into account in meeting the safety requirements established in SSR-4 [1] for operation.	Typo.	X			It is a track changes mode view issue.

83.	JPN33	8.1.	8.2. ~~8.1.~~ In this section, specific recommendations on operational practices and additional considerations in meeting the safety requirements for a conversion facility or an enrichment facility are presented.	Typo.	X			
84.	JPN34	8.16./L3	When maintenance is performed on installation that may contain enriched uranium or near a storage location of enriched ~~materia~~l uranium, criticality safety personnel should be consulted before the work commences.	Appropriate term.	X			
85.	JPN35	8.18.	Compliance of the operational performance of the ventilation system with the fire protection requirements (see para 4.45) should be verified on a regular basis.	Is the para 4.45 quote correct?	X			
86.	JPN36	(c)	(c) A proactive approach based on an adequate understanding of SSC(Structures, Systems and Components) ageing, rather than a reactive approach responding to SSC failures;	Add definition of the abbreviation for SSC.	X			
87.	JPN37	8.23.	The periodic tests and inspections should be completed by regular checks performed by operating personnel, such as: • Monitoring of deterioration (Measurement of metallic impurities in fluoric acid); • Regular visual inspections of ~~U~~uranium powder pipes; • ~~Taking heat images of electrical cabinets;~~	Typo. These two items (3rd and 4th bullets) seems to be too specific. There is a possibility that the inspection method is limited. And the 3rd and 4th bullets are part of the 1st bullet.		X		Last two bullets combined and revised

			~~Check of temperatures of ventilator bearings.~~					
88.	JPN38	8.24.	The management system for a conversion facility or an enrichment facility should include a standard process for all modifications (see para. 3.14).	Typo. There are several other similar parts. For example, please make similar corrections for 5.76, 5.77, 5.110, 8,6, 8.8.	X			
89.	JPN39	8.33. /L3	For conversion or enrichment facilities it is required to put in place emergency arrangements for criticality incidents, which are the only events in which a high external dose rate would be encountered.	Criticality safety in conversion facilities is also addressed in paras. 1.6 and 5.4.		X		See the modified wording
90.	JPN40	8.34. /1st bullet	Estimation of the external exposure prior to an intervention in areas such as those for the processing and handling of ashes containing thorium gamma emitters arising from the ~~fluorine~~ fluorination reactor in conversion facilities;	Better wording.	X			
91.	JPN41	8.73.	The requirements for emergency preparedness and response are established in ~~paras~~ Requirement 72 and paras. 9.120 – 9.132 of SSR-4 [1], in IAEA Safety Standards Series No. GSR Part 7, Preparedness and Response for a Nuclear or Radiological Emergency [25], and recommendations are provided in GS-G-2.1 [26] and in IAEA Safety Standards Series No. GSG-2, Criteria for Use in Preparedness and Response for a Nuclear or Radiological Emergency [27].	Typo.	X			
92.	JPN42	Annex IV	Bring the note attached below the table is suggested to move above the table, as did in ANNEX III.	User-friendliness.	X			

			Safety function includes: (1) Criticality prevention; (2) Confinement to protect against internal exposure and chemical hazards; (3) Protection against external exposure. <table><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table>~~Note: Safety function includes: (1) Criticality prevention; (2) Confinement to protect against internal exposure and chemical hazards; (3) Protection against external exposure.~~					
93.	RUS01	1.5	First sentence should be aligned with para 1.3 SSR-4 or excluded.	Compliance with SSR-4		X		Text was modified, slightly shorter wording is used however the content is essentially the same.
94.	RUS02	1.6	This publication includes specific **recommendations** ~~elements of~~ for ensuring criticality safety in a conversion facility or a uranium enrichment facility. **These recommendations supplement** more detailed guidance provided in the IAEA Safety Standards Series No. SSG-27, Criticality Safety in the Handling of Fissile Material [2].	Editorial remark	X			
95.	RUS03	2.4.	The chemical **toxic** hazards of uranium in a soluble form such as UF6 is more significant than its radiotoxic hazards.	Editorial remark	X			

96.	RUS04	Title of Chapter 3	MANAGEMENT **FOR** ~~AND VERIFICATION OF~~ SAFETY	This Chapter doesn't address any recommendations for verification of safety.	X			
97.	RUS05	3.4.	Potential conflicts between the transparency of information related to safety matters ~~(to facilitate improvements in safety and to reassure the public)~~ **and protection of the information required by security reason** ~~information on site vulnerabilities and safety analysis~~ should be addressed.	Editorial remark. Proposal to delete unclear information and specify the provision.	X			
98.	RUS06	4.2.	The scope of the site evaluation for a conversion facility or an enrichment facility **is established by** ~~should in line with~~ requirements 3 of SSR-1 [10] and requirement 11 of SSR-4 [1] **and should** reflect the specific hazards listed in Section 2 of this Safety Guide.	The requirements SSR-4 **shall be met** not **should**	X			
99.	RUS07	4.4.	To move the provision "Site selection should include assessment of safety risks related to external natural and human induced events" to separate para.	This is a specific provision that differ from the following provisions of this para.	X			
100.	RUS08	4.5.	~~To prevent potential conflicts~~ safety and security interface should be considered systematically in the site evaluation and site selection process (requirement 75 of SSR-4 [1]). Site evaluation and selection should be facilitated by experts from both safety and security disciplines. ~~Sites which are vulnerable to civil unrest should be excluded from consideration in conversion facility and uranium enrichment facility siting process.~~	The interface is important not only for the purpose to prevent the conflict. The sentence is proposed to be deleted or modified due to its ambiguity.		X		We agree with the first proposal, but other aspects are out of the scope of this SG. The second proposal was accepted.

			It is recommended to add **"The selection of a site should take into account both safety and security aspects**".					
101.	RUS09	4.7.	The adequacy of the site evaluation should be reviewed **periodically during the lifetime of the facility including** in case of an increase of a production capacity beyond the original envelope (para 5.14 of SSR-4 [1])	Compliance with SSR-1 and SSR-4.	X			
102.	RUS10	5.13.	These hazards would result primarily in radiological consequences for **the site** personnel, but however might also result in some adverse off-site consequences for **the public** or the environment.	Editorial remark	X			
103.	RUS11	5.15 and 5.16	These paras related to criticality safety should be moved to the section *Prevention of criticality*	To keep the logic	X			
104.	RUS12	5.21	The aim of the criticality safety analysis is to demonstrate that **the safety measures are** ~~design of equipment is~~ such that the values of controlled parameters are always maintained in the subcritical range.	The term *safety measure*s are more general.		X		"…design of equipment together with the related safety measures…"
105.	RUS13	5.39	The design should also provide for the monitoring of the source of releases (**gaseous** ~~air emissions~~ and liquid effluents) as well as monitoring of the receiving environment around the facility and the identification of breaches to confirm there is no the breach of containment barriers and the impact to the environment and the public **complies with authorized limits.**	In compliance with para 6.101 and requirement 25 of SSR-4.	X			
106.	RUS14	5.45	**Where the potential for** exothermic reactions **with large heat releases exists**	Editorial remark	X			

			(as for example the fluorination process in conversion facilities) **facilit**y ~~equipment~~ design should consider appropriate cooling **system to remove heat from the chemical reactions** and ensure safe operation for all facility states. Continuous monitoring of the cooling **system** ~~water~~ should be ensured to prevent uncontrolled release of radioactive material ~~through cooling systems.~~	In compliance with requirement 23 of SSR-4.				
107.	RUS15	5.50	Fire hazard analyses **of the facility should give particular consideration** ~~should at least be carried out~~ for the **areas where**: (a) high-risk fire sources such as centrifuges **are presented**; (b) combustible materials (including low voltage cables) are presented; (c) safety equipment which should be protected **are installed.**	Fire hazard analysis is carried out for the whole facility	X			
108.	RUS16	5.75	To prevent failure of equipment containing hazardous materials (as for example calciners or furnaces), **effective programmes for maintenance, periodic testing and inspection** ~~intervals for its periodic testing~~ should be defined at the design phase.	In accordance with Requirement 65 SSR-4.	X			
109.	RUS17	5.76.	~~The list of specific external hazards for a conversion facility or enrichment facility should include those identified in the following paragraphs under appropriate headings.~~	This list is neither complete nor necessary		X		We agree the list is not complete, therefore changed to "Examples of…"

110.	RUS18	5.93	~~Provision should be made for the automatic measurement and recording of values of parameters that are important to safety and where applicable, manual periodic testing should be used to complement automated continuous testing of conditions.~~	Propose to delete because the similar provision is provided by Requirement 43 and relevant paras of SSR-4	X			
111.	RUS19	5.95	Safety related I&C systems for normal operation of a uconversion facility or an enrichment facility should include systems for the following: (1) Criticality control To add “including criticality detection and alarm system”	In accordance with para 6.149 SSR-4	X			
112.	RUS20	5.96-5.98	~~5.96. Instrumentation should be provided to monitor the process variables and the facility systems over their respective ranges for:~~ ~~(1) Normal operation;~~ ~~(2) Anticipated operational occurrences;~~ ~~(3) Design basis accidents;~~ ~~(4) Design extension conditions, as far as practicable.~~ ~~5.97. The aim should be to ensure that adequate information can be obtained on the status of the facility and correct responses can be planned and taken in accordance with procedures for all facility states.~~ ~~5.98. Adequate and reliable controls and appropriate instrumentation should be provided for monitoring and controlling all the main variables that can affect the safety of the process and the general conditions at the facility. These variables~~	Repetition of the provisions provided in Requirements 43 and 44 and relevant paras of SSR-4 (there is no specific information relevant to the specified facilities) Propose to delete the paras or adapted to the to the specified facilities	X			

			~~include radiation levels, airborne contamination conditions, effluent releases, criticality conditions, fire conditions and ventilation conditions. Instrumentation should also be provided for obtaining any other information about the facility necessary for its reliable and safe operation.~~ ~~5.99. According to the requirements of the safety analysis and any defence in depth consideration, instrumentation and control systems should incorporate redundancy and diversity to ensure an appropriate level of reliability and availability. This should include the requirement for a reliable and uninterruptable power supply to the instruments, as necessary.~~					
113.	RUS21	Section SAFETY ANALYSIS	The Section should be revised to bring into compliance with relevant requirements of SSR-4.	Compliance with SSR-4	X			
114.	RUS22	5.103	~~The risk assessment of the conversion facilities and enrichment facilities should include the safety analysis of the variety of hazards for the whole facility and all activities:~~	Term *risk assessment* is not used in SSR-4. The provision is repetition of appropriate requirements of SSR-4 and GSR Part 4 but with the statement *should*.		X		"risk assessment" replaced with "safety assessment)
115.	RUS23	5.105	A best estimate approach ~~plus~~ **with** uncertainty **analysis** may also be used.	Editorial remark		X		"'best estimate plus uncertainty' approach " is the common name of the method used for example in

								SSG-2, however this para was changed following other comments.
116.	RUS24	5.109	Term *DBA approach* is not used in SSR-4 with regard to safety analysis and need to be clarified or replaced The whole para needs to be properly checked against the requirements established by SSR-4 and GSR Part 3 taking into account the approaches adopted for the safety analysis of the specified facilities		X			The term "DBA approach" was removed. In addition, the description of the two different approaches was simplified to provide clarity.
117.	RUS25	5.110.	Accidents that have more severe consequences as well as progression of events that could potentially lead to a criticality event, radiological or chemical releases should also be analysed to support emergency preparedness and response and assist in the development of emergency plans to mitigate the consequences of an accident.	We agree with this statement. However we propose to discuss applicability DEC to criticality event or chemical releases.		X		The comment is unclear. Our understanding is that the text is fine.
118.	RUS26	MANAGEMENT OF RADIOACTIVE WASTE ~~AND~~	Propose to delete	There are no recommendations related to effluent management in this section.			X	See for example "An appropriate balance should thus be achieved between the

		~~EFFLUENTS~~						loss of uranium through unrecovered waste and the generation of liquid effluents in the recovery process.”
119.	RUS27	5.119.	The general requirements for ~~optimization of protection and safety for~~ predisposal waste management ~~and effluent management and the formulation of a waste strategy~~ are established in the IAEA Safety Standards Series No. GSR Part 5, Predisposal Management of Radioactive Waste [15] ~~and No. SSR-5, Disposal of Radioactive Waste [16~~] with additional guidance provided in the IAEA Safety Standards Series No. GSG-3, The Safety Case and Safety Assessment for the Predisposal Management of Radioactive Waste [17],	GSR Part 5 establishes requirements for the predisposal management of radioactive waste not for effluent management. Disposal of the waste is out the scope of SSR-4.	X			
120.	RUS28	5.123.	~~Effluent releases to the environment without proper monitoring should be avoided (see para 6.102 of SSR-4 [1]).~~	Effluent releases to the environment without proper monitoring **shall** be avoided according to para 9.104 of SSR-4	X			
121.	RUS29	5.142.	The design should allow all systems, structures and components important to safety to be easily inspected in order to detect their ageing (static containment deterioration, corrosion) ~~and obsolescence~~ and **maintained or** replaced if needed.	Obsolescence is a mode of ageing. Some equipment can be maintained rather than replaced	X			

122.	RUS30	5.143.	An ageing management programme should be implemented at the design stage to allow **timely maintenance or** anticipating equipment replacements.	Ageing management programme should consider not only replacement of the equipment but also maintenance.	X			
123.	RUS31	7.1.	The requirements for commissioning are **established** ~~listed~~ in Requirement 54 of SSR-4 [1] and subsequent paragraphs. The operating organization should make the best use of the commissioning stage to become completely familiar with the facility.	Editorial remark.	X			
124.	RUS32	7.1.	It should also be an opportunity to further enhance safety culture, including positive behaviours and attitudes, throughout the entire organization.	This is unclear statement and need to be clarified (how to "further enhance safety culture, including positive behaviours and attitudes…" during commissioning phase).		X		"…to promote and further enhance…" Commissioning is an important milestone when operating personnel gains its values and attitudes of the organization for the whole operation.
125.	RUS33	8.8	Examples of **limits** ~~limiting conditions~~ for safe operation (SSR-4 [1], para. 9.31) for a uranium conversion and enrichment facility such limits are:	Maximum enrichment, feed specification limits and maximum inventories are rather limits than conditions.		X		Limits on operating parameters
126.	RUS34	8.12	~~For anticipated operational occurrences, design basis accidents and design extension conditions without significant facility damage the operating procedures~~	Propose to delete this provision because of its incorrectness.	X			

			~~should provide instructions for the return to a safe state.~~					
127.	RUS35	8.23	Propose to move the provision "The operating organization should prepare procedural guidelines and provide training to ensure that the responsible personnel have the necessary training and authority to ensure that modification projects are carefully considered" to a new para because it is a specific recommendation.	To keep the logic.	X			
128.	RUS36	8.27	Modifications performed on ~~structures, systems and components~~ **design, layout or procedures of the facility** might negatively affect security **arrangements** ~~equipment~~ and vice versa. For example, malfunction of safety equipment may damage nearby security equipment.	Propose to make the provisions more general.	X			
129.	RUS37	8.27	Therefore, **before approval and implementation**, **any proposed changes** to the facility or **management arrangements** ~~its documentation~~ should be reviewed, assessed and endorsed from the safety **objective view** and its interface with security **should be evaluated to verify that they do not compromise each other.**	To make the provision more general and clear.	X			
130.	RUS38	8.49	For any wet cleaning process, a safe uranium holdup **limit** should be defined.	Editorial remark	X			
131.	UK01	5.9 and 5.13	Suggest that text is added placing an requirement on facility designers that it is good practice to ensure that by design the criticality dose contour from an assumed reference criticality excursion (to be defined and justified by the operator) cannot impinge on populated areas (either	Draft Standard currently seems to accept that criticality dose contours can go off the licensed site.	X			Added in "Safety analysis for accident conditions"

			other workers not in the plant or the public), or if not possible a justification should be provided by the operator as to why this cannot be achieved.					
132.	UK02	5.17	Text should be modified to say that criticality safety for processing of DU or natural U does not need to be considered, **provided** the operator can demonstrate there is no credible fault sequence whereby enriched U is fed to the process by an unrevealed error.	Assessment will be needed if there is any credible fault sequence where enriched U can be fed to a process designed for natural or DU. In UK experience, the same size cylinder is sometimes used internationally for both DU & HEU and thus is considered a credible fault sequence.	X			
133.	UK03	7.2 (1)	Suggest that at the inactive commissioning stage, opportunity could be taken for the conduct of smoke tests etc. to confirm the proposed siting of key radiological instruments in the plant i.e. to ensure on plant air flows are as expected from design calculations.	Incorrect siting of radiological instruments has a potential to miss radiological releases of contaminated material that the instruments are designed to detect and hence fail to warn workers of the presence of elevated levels of contamination.	X			New para added to address this.
134.	UK04	8.16	Commentary is needed on the importance of careful reinstatement of any engineered structures, required for neutron isolation of adjacent fissile units as a requirement of the criticality safety assessment, to ensure that such structures continue to deliver their required safety duty when reinstated. Similarly any reinstatement of soluble neutron poison levels, required from the criticality safety assessment, following maintenance will need confirmatory checks that the poison has been reinstated and at the correct concentration etc.	Maintenance has a potential to disrupt or remove structures or systems which are important in maintaining criticality safety and are important requirements emerging from the Duty Holder's criticality safety assessment of the plant or system.	X			A new provision was added to 8.16.
135.	UK05	8.23	Suggest that the Standard flags that the operators criticality safety assessment	There is a lot of OpEx (e.g. see a number of papers from ICNC 2019),	X			A new provision was

			identifies, at the design stage, all possible areas in the plant/process where there is a potential for adventitious accumulations of fissile material during the operational life of the plant and that inspection of such areas is a part of the routine schedule of plant inspections.	from U processing plants in particular, of Duty Holders finding accumulations of fissile material in unexpected plant locations as the plant ages, sometimes posing a direct threat to criticality safety. Efforts should hence be made at a plant's design stage to identify (and to try to eliminate by design) any such potential for accumulation and if such locations cannot be designed out, then they should be routinely inspected to ensure any accumulations are dealt with before criticality safety is threatened.				added in the end of section 8.
136.	UK06	8.36(f)	Suggest that text be added to reflect that positioning of radiological instrumentation e.g. CAMs, SAS etc. should be periodically revalidated (e.g. by smoke testing) e.g. during the plant's Periodic Review of Safety and also whenever there is a significant engineering change on plant that could have a potential to disrupt the ambient air flows on the plant.	Over time as conditions change on the plant and/or as plant modifications are made, the positioning of key radiological instrumentation (installed to detect airborne contamination) may become sub-optimal and hence not meet its original safety case claims.			X	We agree the proposal is technically correct, however is very detailed and specific to criticality safety for which there is another Safety Guide SSG-27. This SG refers on several places to it.
137.	UK07	8.48 – 8.50	Consider adding advice on calculations of system reactivity due to temperature in cases where Hex cylinders may be stored on outside rafts in extreme conditions.	A lot of recent work has been in progress that indicates this is an area that has not been adequately considered within criticality safety assessments in the past.			X	We agree the proposal is technically correct, however is very detailed

								and specific to criticality safety for which there is another Safety Guide SSG-27. This SG refers on several places to it.
138.	UKR01	Contents, page 3	Management of radioactive waste and effluents (8.67-8.7***1***) Emergency preparedness and response (8.7***2***-8.7***6***) Feedback of operating experience (8.7***7***) 9 PREPARATION FOR DECOMMISSIONING (9.1-9.***3***) The decommissioning plan (***9.4***-9.5)	Paragraphs referenced incorrectly.	X			
139.	UKR02	§1.5	The safety requirements applicable to fuel cycle facilities (i.e. facilities for uranium ore ~~***processing and***~~ refining, conversion, enrichment, reconversion, fabrication of fuel including uranium and plutonium mixed oxide fuel, storage and reprocessing of spent fuel, associated conditioning and storage of waste, and facilities for the fuel cycle related research and development) are established in SSR-4 [1]. This Safety Guide provides recommendations on meeting these requirements for conversion facilities or uranium enrichment facilities during their siting, design, commissioning, operation and preparation for decommissioning. …	The proposal is to exclude processing of uranium ore. §1.3 SSR-4: "Requirements for nuclear power plants, research reactors and critical assemblies, facilities for the mining and ***processing of natural ore*** and waste disposal facilities are established in other IAEA safety standards and therefore ***are not addressed in this publication***." §1.8 SSR-4: "Facilities for the mining and ***processing of natural ore***, nuclear power plants, research reactors, critical assemblies and waste disposal facilities ***are outside the scope of this publication.***"	X			

140.	UKR03	§4.2.	The scope of the site evaluation for a conversion facility or an enrichment facility should in line with requirements 3 of SSR-1 [10] and ***§§5.1-5.14*** of SSR-4 [1] reflect the specific hazards listed in Section 2 of this Safety Guide.	Requirement 11 of SSR-4 is addressed to the use of a graded approach. Site evaluation requirements are presented in §§5.1-5.14.	X			
141.	UKR04	§5.75	To prevent failure of equipment containing hazardous materials (for example calciners or furnaces), intervals ***and scope*** for its periodic testing should be defined at the design phase.	It is proposed to add a scope of periodic testing.		X		The text was modified following other comments, it is more general now and address the issue here as well.
142.	USA01	General	DS517 Comprises revision of three standards SSG-5, SSG-6, and SSG-7 Though the standards are presented as three independent safety guides; however, the three standards are designated as DS517. If these standards would continue to be independent standards, we recommend identifying these standards as subset of DS517 (e.g.; DS517-a; DS517-b; and DS517-c).	Provide different designation of the standards as subset of DS517 to avoid confusion and identification of each standard since they are presented as independent standards.			X	The designation is in line with SPESS process.
143.	USA02	General	The way DS517 three standards presented for review without providing clean copy (e.g.; current texts are with red-marked and strikeout text) to facilitate proper review of the documents.	Avoid confusion in the review and edit by providing clean copies of the texts			X	The track changes mode is compulsory for amendments by revision. Clean copy may be provided by

								individual requests from the TO.
144.	USA03	SSG-5, Para 1.3	Modify Para 1.3 to read: 1.3. The safety aspects of uranium-conversion and uranium-enrichment facilities ~~and uranium enrichment facilities~~ are ~~is~~ addressed through assessment and evaluation of ~~by means of~~ their ~~proper~~ siting, design, construction, commissioning, and operation; as well as, ~~including~~ general management for safety aspects and decommissioning.	Language and minimizing redundancies.		X		The text was modified in combination with other comments.
145.	USA04	SSG-5, 1.6	1.6. This publication includes specific elements of ensuring criticality safety in a conversion facility or a uranium enrichment facility. More detailed guidance on criticality safety ~~The guidance provided supplements more detailed guidance~~ is provided in the IAEA Safety Standards Series No. SSG-27 [2]. ~~,~~ ~~Criticality Safety in the Handling of Fissile Material~~	Language, reduce redundancies.	X			
146.	USA05	SSG-5, 1.7	In many instances, DS517 present both the reference # and complete title of the reference. We suggest presenting only the reference # since the complete title should be listed in the reference list.	Minimize repetition and redundancies.		X		The references are in accordance with the IAEA Style Manual. References to IAEA Standards when appear for the first time in the text include the

								whole title. In all other cases only the number is provided.
147.	USA06	SSG-5, 5.124	Modify Para 5.124 to read: 5.124. Liquid effluents to be discharged to the environment should be lower than the allowed regulatory limits established by the concerned authorities, and should be monitored and suitably pre-treated as necessary to reduce the discharges of radioactive material and hazardous chemicals.	Effluent discharges should be below the regulatory limits allowed by the authorities.		X		This is absolutely correct, however this is a requirement and therefore should not be rephrased as a recommendation.
148.	USA07	SSG-5, 5.126	Add a new Para: 5.126. Radionuclides in effluents discharged to the environment should be in soluble form to allow effective dispersal in the aquatic system without coagulation, deposition, and buildup of the radionuclides resulting in the need for environmental cleanup activities.	Effluents should be readily soluble to avoid sequestering of coagulation.	X			
149.	NSGC1	Security aspects	Add NSS-8 - Preventive and Protective Measures against Insider Threats and NSS-25 - Use of Nuclear Material Accounting and Control for Nuclear Security Purposes at Facilities	Guidance mentioned should be considered			X	As mentioned in Section 1, nuclear security is out of the scope therefore it is not practical to provide an exhaustive list of guidance documents. The two key

								standards are referenced.
150.	NSGC2	1.8	-	1.8. This Safety Guide does not include **nuclear** security recommendations	X			
151.	NSGC3	3.4	3.4. Coordination of **nuclear** safety and security interface in the establishment of the integrated management system should be ensured. Potential conflicts between the transparency of information related to safety matters (to facilitate improvements in safety and to reassure the public) and information on site vulnerabilities and safety analysis should be addressed. The management system should take into account the specific ~~**aspects**~~ **concerns of each discipline regarding** ~~**related to**~~ the management of information ~~**in each discipline**~~.	Rules for transparency, sharing and protection of information apply to any information, no matter its nature (nuclear safety, nuclear security, others…). What are different are the concerns: for nuclear safety, there is a special concern to sharing as much information as possible (for different reasons), for nuclear security, there is a special concern to protect **any** information that could be used by malicious actors.	X			
152.	NSGC4	8.76	8.76. For establishing access control procedures during emergencies, when there is a necessity for rapid access and egress of personnel, safety and security specialists should cooperate closely. Both safety and security objectives should be ~~**met**~~ **sought for** during emergencies **as much as possible,** in accordance with regulatory requirements. **When it is not possible, the best solution taking into account both objectives should be pursued.**	The specificity of an emergency situation is that safety/security objectives may not be met, because of the situation. In particularly difficult situations, pre-planned procedures may need to be adapted to the situation.	X			