Master Resolution Table

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

DS517-C

SSG-7: Safety of Uranium and Plutonium Mixed Oxide Fuel Fabrication 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	Annex I	Figure with bad lower resolution	This same figure should be incorporated, with good lower resolution, directly in the manuscript.	X			
2.	CAN01	SSG-7, Para 5.112	Editorial: Change text, as follows: c) MOX powder is formed in the fuel fabrication process, and the associated criticality hazard ~~shall~~ should be	Guide cannot set requirements.	X			
3.	CAN02	SSG-7, Para 5.13 b)	Technical: Change text, as follows:	1. Current text is not complete, from technical standpoint. Add other possible moderators such as Be,	X			

			The isotopic composition of the uranium i.e. the ratio of the amount of 235U to the total amount of uranium (235U/Utotal). When this ratio is less than 1%, and given that there is no heavy water (D20), beryllium, graphite or other moderators (more effective than light water) present in the facility, no criticality hazard is to be considered;	graphite, etc. Change "0" in D2O to "O".				
4.	CAN03	SSG-7, Para 5.17	Editorial: Highlighted text is unclear. 5.17. Special consideration should be given to criticality safety	Provide clarification for the following question: What is technical description of "special" in those special considerations?		X		"special" was deleted
5.	CAN04	SSG-7, Para 5.92	Technical: Change 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, should 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 (to be deleted) 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, chapter 3 or ANS/ANSI-8.3 standard. See comment 13 for more detailed reasoning.	X			
6.	CAN05	SSG-7, Para	Remove one of the paras or consolidate text.	Both paras contain nearly identical text.	X			

		8.45 and 8.46						
7.	CAN06	SSG-5, SSG-6, SSG-7 Para 3.1 to 3.19	3.1 Requirements 4 and 5 of SSR-4 safety of Nuclear Fuel Cycle Facilities [1], provide the requisite management system requirements for [insert applicable facility type]. 3.2 GSR Part 2 Leadership and Management for Safety, Section 4.8 [8], establishes the overall requirements for an integrated system for facilities and activities. IAEA Safety Standards Series No. GS-G-3.1, Application of the Management System for Facilities and Activities [6] and No. GS-G 3.5, The Management System for Nuclear Installations [7] provides ways of applying those requirements. 3.3 Applicable portions of the management system shall be defined and implemented before undertaking any work covered by SSR-4 and this Safety Guide.	Replace all, the proposed text does not deliver what Para 3.1 states in that it does not "…provide a means of meeting the requirements 4 and 5 of SSR-4 [1] for the management for and verification of safety for…" Nor does it add any value as either recommendations or supplementary guidance to GS-G-3.1 and GS-G-3.5. The text is overly wordy and generally repeats SSR-4, while substituting 'shall' with 'should' contradicting and weakening the requirement language of SSR-4. SSR-4 Requirements 4 and 5, are well stated articulating the management system requirements for such facilities. Reference to GSR Part 2, GS-G-3.1 and GS-G-3.5, as ways of applying those requirements should be sufficient. Final point: spreading requirements and/or guidance over too many documents could result in misinterpretation between facility operators and the regulatory body; therefore, achieving the opposite of the intended safety outcomes.			X	Section 3 describes in more details individual elements of a Management System for a specific type of Fuel Cycle Facility and provides further details compared to referenced existing standards. Any further proposal to add specific guidance is welcomed.

8.	FIN01	Through out the docume nt	Correct the notation for chemical compounds to use superscripts or subscripts for the numbers (eg.PuO_2 or ^{235}U)	Consistency with other sections, and clarity	X			
9.	FIN02	Whole docume nt		The SSG-6 and SSG-7 standards should be reviewed together. A consistency between the two should be ensured. The order of various contents should be the same in the two as well as the order of paragraphs as far as possible. In addition, it would be helpful if the wordings of the 'similar' paragraphs would be as far as possible, the same. It should also be checked and ensured that no requirements given to one and relevant also to the other are left out. Now it seems to me the case.	X			
10.	FIN03	4.3/3	With appropriate design and operation**, it** can be ensured that …		X			
11.	FIN04	5.2 and 5.3	5.2. The requirements on maintaining subcriticality are established in requirement 38 and para. 6.138 – 6.156 of SSR [1]. Further guidance on the design of a MOX fuel fabrication facility to ensure subcriticality is provided in Section 3 of SSG-27 [4]. 5.3. 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~~	Items related to subcriticality should be in para 5.2 and para 5.3 should only contain things related to confinement and cooling.	X			

			~~subcriticality is provided in Section 3 of SSG-27 [4].~~					
12.	FIN05	5.14/4	~~Different~~ Various methods to accomplish this are described in SSG-27, …	Better language	X			
13.	FIN06	5:48/9	… Extinguishing gas other than CO2 may be used in the event of a fire breaking out in a glovebox	CO2 is working as a moderato so it should not be used as extinguishing gas if criticality is to be avoided	X			
14.	FIN07	5.72(e)	- Displacement (geometry control, fixed ~~poisons~~ absorbers); - Loss of material (geometry control, soluble ~~poisons~~ absorbers).		X			
15.	FIN08	5.75	Hazards from external fires and explosions could arise from various sources in the vicinity of a MOX fuel fabrication facility, 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			
16.	FIN09	Heading between paras 5.75 and 5.76		In SSG 6 this heading is combined with the previous one as "*External fires and explosions and external toxic hazards"* Consider which one is better and use the same in both	X			
17.	FIN10	5.85-5.88	In accordance with the risks identified in the site evaluation (see Section 4), uranium fuel fabrication facility should be designed to withstand the design basis impact.	Will this standard say nothing about the design to withstand the design basis impact (Like in SSG6 5.75)? Is this not required for a MOX fabrication facility while it is required for a uranium fuel fabrication facility?	X			
18.	FIN11	5.88	Instrumentation should be provided for measuring all the main variables whose variation may affect the safety of processes (such as pressure, temperature and flowrate). In addition, instrumentation should be	SSG 6 5.78 (given here beside) has a better formulation to this paragraph.	X			

			provided, for monitoring general conditions at the facility (such criticality safety related parameters, as radiation levels, releases of effluents and ventilation conditions), and for obtaining any other information about the facility necessary for its reliable and safe operation (such as presence of personnel and environmental conditions)					
19.	FIN12	5.92 (1), dash 1.		Should the control parameters really include all of there as it now reads, or should there be something that indicates that the control parameters should contain those that are relevant for the method of criticality control	X			Changed to “usually include”
20.	FIN13	After 5.92		Is there no need for requirement on instrumentation in various states of the facility, see e.g. requirements 5.83-5.86 in SSG6?		X		Yes, there is no need, the same approach is applied in SSG 5,6,7
21.	FIN14	5.95 (a)		The layout of the text should be revised. the dashed bullets should start at separate lines.	X			
22.	FIN15	5.97/1	~~for~~ The risk assessment of MOX fuel	No need for the word for	X			
23.	FIN16	5.107/2	consequences of an accident, the ~~wide~~ entire range of physical processes that could lead to a release	Shouldn’t all the processes be considered. This is also the case SSG 6 (5.95)	X			
24.	FIN17	5.107/4	… modelled in the accident analysis and ~~the bounding cases encompassing~~ the worst credible consequences should be determined	Isn't it enough with the worst case, like in SSG 6 5.95?	X			
25.	FIN18	5.108 +		Why aren't there given in this standard advice on how to do the safety assessment (the two possible approaches, like in SSG6 5.96)?		X		There was no general agreement among experts about

								approaches used for MOX facilities as for example for enrichment or fuel fab. facilities. It was agreed that the guidance provided in para. 5.104 is satisfactory.
26.	FIN19	Heading before 5.114	*Assessment of possible radiological or associated chemical consequences*	Leave the title as it was! The paragraphs also contain something about the chemical consequences.	X			
27.	FIN20	5.114 (c-d)	(d) Identification and analysis of conditions at the facility, including internal and external initiating events that could lead to a release of material or of energy with the potential for adverse effects, the time frame for emissions and the exposure time, in accordance with reasonable scenarios. (e) Quantification of the consequences for the individuals and population groups identified in the safety assessment.	Why is this crossed out from the MOX faciltiy while it is left for Uranium faciltiy (SSG6 5.102 d). Also, a bullet should be added corresponding to SSG6 5.103 (e) Quantification of the consequences for the individuals and population groups identified in the safety assessment.	X			
28.	FIN21	5.120	Useful guideline for assessing the acute and chronic toxic effects of chemicals used in MOX fuel fabrication facilities is provided Ref. [~~15~~XX].	The reference should be corrected. This does not refer to the same reference as in SSG6!	X			
29.	FIN22	5.124	MOX fuel fabrication facilities use dry processes and generate dust.~~, and the~~ The effluent discharges from MOX fuel	Divide the sentence into two for clarity. One issue in one sentence not everything in the same.	X			

			fabrication facilities should be reduced by filtration, which normally consists of a number of high efficiency particulate air (HEPA) filters in series					
30.	FIN23	5.140	The analyses of handlings should cover: (a) Transportation routes and intersections; (b) Technical limits of the transportation vehicles; Handling failures during transportation.	These could be numbered (a), (b) and (c), like in SSG6 5.123	X			
31.	FIN24	7		The numbering of the paragraphs is not working for paras 7.3-7.6 and 7.8. Please reconsider it.	X			
32.	FIN25	8.4		If comparing to SSG 6 paras 7.7 and 7.9 should be at the same level as 7.1 and 7.2 while 7.3-7.6 and 7.8 should be under 7.2		X		The flow of paras in both SSGs looks harmonized. It cannot be exactly the same as the content is slightly different.
33.	FIN26	Heading before 8.12	~~FACILITY OPERATION~~ OPERATIONAL DOCUMENTATION	As in SSG-6			X	In SSG-6 this section contains guidance only for documentation. However, in SSG-7 it includes guidance also for

								operation as such.
34.	FIN27	paragraph just before Ageing management (former 7.18)	Programme for calibration and periodic inspections of the facility should be established. Its purpose is to verify that the facility and SSCs are operating in accordance with the operational limits and conditions. Suitably qualified and experienced personnel should carry out calibrations and inspections. Particular consideration should be given to fatigue affecting equipment and to the ageing of SSCs.	Why is this removed from SSG-7 while it is left in SSG-6 8.23? Aren't calibration and periodic inspections needed on a MOX facility?	X			
35.	FIN28	8.40/1	The modifications made to a facility (including those to the operating organization) should be reviewed on a …	As in SSG-6 8.32	X			
36.	FIN29	8.43		The dashed bullets should be numbered a), b) etc. for clarity and to make it easier to refer to them.	X			
37.	FIN30	8.45 and 8.46		8.45 and 8.46 are saying the same things. Reduce overlapping.	X			
38.	FIN31	Items 'Radiation protection' and 'Criticality safety'		Why is the order of subjects different in SSG7 and SSG6. In SSG6 Radiation protection is before Criticality safety and here in SSG 7 vice versa. Consistency between the two standards is needed.	X			
39.	FIN32	8.52/3	actions as specified in ~~Ref.~~ GSR Part 3 [16]. The procedures	Consistency in the notation within the standard	X			
40.	FIN33	8.54	The monitoring results from the radiation protection programme should be compared with the operational limits and conditions. Furthermore, these monitoring resulst ~~and they~~ should be used to verify the dose	Clarity, one thing in a sentence.	X			

			calculations made in the initial environmental impact assessment.					
41.	FIN34	8.55/2-3	(^{238}Pu-~~238~~ has a short half-life and ~~241~~Pu-~~241~~ decays to	Duplicate expression	X			
42.	FIN35	8.55/3	^{241}Am). ~~This~~ The doses should be controlled by integrity of the first containment barrier, which should be monitored close to the workplace	The word 'This' refers to the isotopic proportion of plutonium. Do you really mean that the isotopic proportion should be controlled by the first containment barrier and by means of air-sampling?	X			
43.	FIN36	8.56 bullet l)/6	operations, certain maintenance operations or changing of gloves of a glovebox).	Reduce the risk of confusion as this bullet discusses personal protective equipment. The gloves to be changed are certainly not personal gloves	X			
44.	FIN37	8.56 bullet n)/1	Any ~~staff~~ personnel having wounds should protect		X			
45.	FIN38	8.60 and 8.62		Why are paras 8.60 and 8.62 in different order than 8.43 and 8.45 in SSG6? Consistency between the two standards is needed.	X			There is no particular reason, this is a revision and if the order was different before it remains. Consistency will be checked again after incorporating all changes and comments.

46.	FIN39	8.70/4	… Carbon dioxide may be used in automatic fire suppression systems except where it may cause a criticality risk. A leakage…	CO_2 acts as a moderator and should not be used in environments where it may risk criticality safety	X			
47.	FIN40	After 8.81	8.xx Quality control regimes should be applied to the treatment and disposal of waste from all streams to ensure compliance with authorizations for disposal.	I assume this is equally important for a MOX as for a Uranium facility. (SSG-6 8.66)	X			
48.	FIN41	8.87-8.88	The programme for the feedback of operational experience at fuel fabrication facilities should cover experience and lessons learnt from events and accidents at the nuclear facility as well as from other nuclear fuel cycle facilities worldwide and other relevant non-nuclear accidents. It should also include the evaluation of trends in operational disturbances, trends in malfunctions, near misses and other incidents that have occurred at the research reactor and, as far as applicable, at other nuclear installations. The programme should include consideration of technical, organizational and human factors.	There should be a paragraph on the programme for feedback of operating experiences like the one in SSG-6 8.73. This should be as an own paragraph	X			
49.	FIN42	9.2-9.3	Special procedures should be implemented during the preparatory works for decommissioning to ensure that criticality control is maintained when handling equipment whose criticality is controlled by geometry [SSG-6 9.3]	Consider adding similar paragraphs as 9.3 and 9.4 in SSG-6. Especially 9.3 seems to me important as is relates to maintaining criticality safety	X			
50.	FIN43	Ref[2]	SSG-6 is under review, if published before or simultaneously with this one, the reference should be updated.			X		Yes, however we cannot update the reference before the revision is

								published. It will be done when published.
51.	FIN44	Ref[4]	SSG-27 is under review, if published before this one, the reference should be updated.			X		Yes, however we cannot update the reference before the revision is published. It will be done when published.
52.	FRA01	5.109	Analysis of Design extension conditions 5.109. 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 MOX fuel fabrication facility 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			

53.	GER01	SSG-7 3.20	"Means for decontamination and screening of personnel as well as protective active substances related to specific hazards of the installation"	The amendment is supposed to ensure that certain protective agents are available in facilities, where chemical hazards are present.	X			
54.	GER02	3.7 first item	… of management necessary to achieve the safety objectives of the operating organization….	Clarification	X			
55.	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			
56.	GER04	3.7 third item	…to achieve the safety goals of the organization.	Clarification	X			
57.	GER05	5.31 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. 8.46 of this document).		X		Reference to requirement 8 added, SSR-4 refers further to GSR Part 3.
58.	GER06	5.34	… of protection in addition to existing barriers (para. **4.109** of SSR-4 [1]).	Wrong reference. Probably 9.100 of SSR-4.	X			
59.	GER07	5.37	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			
60.	GER08	8.32	… should include a standard process for all modifications (see para. ~~3.8~~ 3.15).	Wrong reference.	X			
61.	GER09	1.10	This Safety Guide covers the production of MOX fuel from mixtures of uranium and plutonium oxides, obtained by either	Wording	X			

			blending separate uranium and plutonium oxide powders or as a ~~pre-~~prepared blend.					
62.	GER10	5.12	~~The~~ For ensuring criticality safety in a MOX fuel fabrication facility one or more of the following parameters of the system should be kept within subcritical limits:	Wording	X			
63.	GER11	5.122 (a)	~~It is possible to reduce waste from gloveboxes by reducing the amount of material imported into the glovebox.~~	Delete the sentence. It can be expected that there is just the material in the glovebox that is needed for fulfilling the necessary work.	X			
64.	GER12	8.4	The safety committee in a MOX fuel fabrication facility, as defined in SSR-4 [1], para. 4.29, should ~~be developed~~ emanate from the safety committee established for commissioning.	Clarification	X			
65.	GER13	8.17 (c)	Examples of administrative controls for safe operation (SSR-4 [1], para. 9.36) for a MOX fuel fabrication facility are: a) Minimum staffing on shift; b) Availability of specific expertise at all times when the facility is in production (criticality expert, radiation protection expert, etc.); Minimum and maximum number of persons working in a glovebox.	Also maximum number of persons allowed should be controlled.	X			
66.	GER14	8.45/8.46	Combine both paragraphs.	Same or similar text.	X			
67.	GER15	1.3	The MOX fuel fabrication processes rely to a large extent on passive and active ~~and passive~~ engineered safety measures in addition to administrative controls to ensure safety. The principle hazards of a MOX fuel facility are release of actinides (plutonium, americium and uranium in order of	Clarification – passive safety measures should be mentioned first. Additional hazard due to trans-uranic actinides	X			

			significance), increased radiotoxicity due to trans-uranium actinides, and nuclear criticality.					
68.	GER16	2.5 Line 3	…. — Heat removal systems in storage areas to remove decay heat from reactor grade plutonium ~~(however, the buildup of heat is not immediate);~~	We suggest to delete this statement	X			
69.	GER17	2.5 Line 5	…. — Systems executing confinement functions ~~Dynamic containment systems~~ should continue to operate to prevent ~~leakage~~releases of radioactive materials from the facility ~~because static barriers ensure confinement of radioactive material only for a finite period of time~~;	A static containment is considered as a physical, leaktight barrier that ensures the confinement function for an infinite periode of time, expect acceptable releases in accordance with the technical achievable leaktightness. In line with the IAEA terminology and glossary, it would be better to use the here the confinement function and refer to different technical solutions to implement this function.	X			
70.	GER18	3.7 Line 4	…. In general: — Management responsibility includes the support and commitment of management necessary to achieve the objectives of the operating organization in such a manner that safety is not compromised by other priorities. — Resource management includes the measures necessary to ensure that the resources essential to the implementation of strategy and the achievement of the safety objectives of the operating organization are identified and made available.	In this paragraph priority to safety is missing. The proposed modification will align the draft with Requirement 5 of GSR-Part 2 and Requirement 3 of SSR-4.	X			

			— Process implementation includes the activities and tasks necessary to achieve the goals of the organization. — Measurement, assessment, evaluation and improvement provides an indication of the effectiveness of management processes and work performance compared with objectives or benchmarks; …..					
71.	GER19	After 3.9 New item	There should be clear, written assignment of responsibilities, as criticality safety officer, radiation protection officer, and others.	Please add this important item	X			
72.	GER20	3.10 Line 4	… The management of operating organization should: — participate in the activities by determining the required personnel competence and providing initial and periodic training, as necessary; ….	Clarification	X			
73.	GER21	3.18 Line 5	…. There is also a danger that conditions may change slowly over time in response to factors such as ageing of the facility or owing to increased production pressures, or complacency.	Clarification			X	Such term is not used in IAEA Safety Standards.
74.	GER22	4.1 Line 4	…. Risks posed by possible significant external hazards (e.g. earthquakes, accidental aircraft crashes, fires, accidential explosions in nearby public traffic, e.g. in a railway wagon with liquefied gas, and extreme weather conditions) will probably dominate in the site evaluation process and need to be	Additional risk	X			

			incorporated into the design of the facility. …..					
75.	GER23	5.21	Each ~~static~~ physical barrier of the containment system should be complemented by one or more ~~dynamic containment~~ associated systems, which should establish a cascade of pressure between the environment outside the building and the contaminated material inside the building, and across all static barriers within the building. The ~~dynamic containment~~ associated systems should be designed to prevent the movement or diffusion of radioactive or toxic gases, vapors and airborne particulates through any openings in the barriers to areas of lower contamination or concentration of these materials. The design of the ~~dynamic containment~~ associated systems should address, as far as practicable: a) Operational states and accident conditions; b) Maintenance, which may cause localized changes to conditions (e.g. opening access doors, removing access panels); c) Where more than one ventilation system is used, protection in the event of a failure of a lower pressure (higher contamination) system, causing pressure differentials and airflows to be reversed; The need to ensure that all static barriers, including any filters or other effluent control equipment, can withstand the maximum differential pressures and airflows generated by the system.	Terminology adapted to IAEA Safety Glossary 2018 Edition (see “confinement”, “containment”, and “containment” system). A containment systems consist of a structural closed physical barrier and its associated systems (ventilation systems, isolation of penetrations, etc.)	X			
76.	GER24	5.87	Instrumentation should be provided to monitor the relevant ~~variables~~ parameters	Wording	X			

			(such as radiation doses due to external exposure, air quality of operational areas and building pressure), and systems (such as ventilation systems) and general conditions (such as temperature, contamination) of the facility over their respective ranges for: ….					
77.	GER25	5.88	Instrumentation should be provided for measuring all the main ~~variables~~ parameters whose variation may affect the processes, for monitoring for safety purposes general conditions at the facility (such as criticality safety related parameters, radiation doses due to internal and external exposure., releases of effluents and ventilation conditions), and for obtaining any other information about the facility necessary for its reliable and safe operation.	Wording	X			
78.	GER26	Between para 5.144 and 5.145	**Emergency preparedness and response**	Both issues are covered	X			
79.	GER27	7.2 Line 13	… In this phase, operators should ~~take the opportunity to~~ prepare the set of operational documents and ~~to~~ train personnel in the operating procedures, safety requirements and emergency procedures. …..	Clarification	X			
80.	GER28	8.5 Line 3	… In addition, personnel should be provided periodically with basic training in criticality and radiation safety and emphasis should be made on protection from radiation exposure, criticality control and emergency preparedness and response.	Important to any personnel handling fissile material	X			

81.	GER29	8.10	… c) Alertness to the possibility of failures, malfunctions and errors in automatic and remote systems;	Please add for clarification	X			
82.	GER30	8.32	The management system for a MOX fuel fabrication facility should include a standard process for all modifications (see para. 3.8). This process should use a modification control form or equivalent management tool. The operating organization should prepare procedural guidelines and provide initial and periodic training to ensure that the responsible personnel have the necessary training and authority to ensure that modification projects are carefully considered. ….	The training should be both initial and periodic	X			
83.	IND01	2/1.1	This Safety Guide supersedes the Safety Guide on the Safety of Uranium and Plutonium Mixed Oxide (MOX) Fuel Fabrication Facilities that was issued as IAEA Safety Standard Series No. SSG-7 in 2010.	Later 'MOX' word is used.	X			
84.	IND02	28/5.47	Compartmentalization of the buildings and ventilation ducts as far as possible to prevent the spreading of fires. The buildings should be divided into fire zones and structural design should consider respective fire load/fire rating. Measures should be put in place to prevent or severely curtail the capability of a fire and smoke to generate soot and spread beyond the fire zone in which it breaks out. The higher the fire risk, the greater the number of fire zones the building should have.	Structural components of MOX fuel building should be designed for fire load.	X			

85.	IND03	31/5.65	Ventilation systems are designed to provide cooling and so to maintain temperatures below specified values. In a MOX fuel fabrication facility, in the event of a failure of the ventilation system, the time interval before confinement is breached should be adequate for repairing the failure or for taking alternative actions. All systems, structures, components should be so designed that they can withstand heat load generated during the above interval.	Heat generated during the interval of failure of ventilation system should not jeopardize the safety of SSC.	X			
86.	IND04	31/ 5.66	Handling systems [e.g. cranes] should be designed to reduce the frequency of occurrence of load drops. The consequences of possible load drops should be minimized" e.g. by qualification of the containers for the drop, and by the design of floors and the provision of safe travel paths as well as providing single failure tolerant cranes.	Handling error can be minimized by using single failure cranes			X	Single failure tolerance is not about minimization of consequence, it related to prevention.
87.	IND05	34/5.74	**Suggestion:** The following highlighted text from 5.74 may be shifted to 5.84: Depending on the MOX fuel fabrication facility's site characteristics and location, as evaluated in the site assessment (Section 4), the effect of a tsunami induced by an earthquake and other extreme flooding events should be addressed in the facility design.	Tsunami creates flooding of the plant. Therefore, it should not be in the section on 'Earthquake'			X	We believe it is fine here since it related to the consequence of an earthquake. Flooding as such is covered by later provisions.
88.	IND06	34/5.76	To demonstrate that the risks associated with such external hazards are below acceptable levels, the operating organization should first identify all potential sources of hazards and	Air shock waves due to explosion can cause structural damage to facilities	X			

			then estimate the associated event sequences affecting the facility. The radiological or associated chemical consequences of any damage should be evaluated, and it should be verified that they are within acceptance criteria. Toxic hazards should be assessed to verify that specific gas concentrations meet the acceptance criteria. It should be ensured that external toxic hazards would not adversely affect the control of the facility. The operating organization should carry out a survey of potentially hazardous installations and transport operations for hazardous material in the vicinity of the facility. In the case of explosions, risks should be assessed for compliance with overpressure criteria. To evaluate the possible effects of flammable liquids, toxic spills, volcanic ashes, falling objects (such as chimneys), air shock waves and missiles resulting from explosions, their possible distance from the facility and hence their potential for causing physical damage should be assessed.					
89.	IND07	36/5.81	If safety limits for humidity and/or the 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. Structural components of buildings (as static containment) should also be designed for extreme temperature and humidity and its associated effects such as shrinkage in concrete.	Extreme temperature not only affect the air conditioning system, it also generates thermal stress in structural components.	X			

90.	IND08	37/5.84	For any flood events such as extreme rainfall (for inland site), storm surge (coastal site), extreme rainfall, attention should be focused on the stability of buildings (e.g. hydrostatic and dynamic effects), the water level and, where relevant, the potential for mudslides. Consideration should be given to the highest flood level historically recorded and to siting the facility above this flood level, at sufficient elevation and with sufficient margin to account for uncertainties (e.g. in postulated effects of global warming), to avoid major damage from flooding.	Any kind of flood can disturb the stability of the building not only extreme rainfall.	X			
91.	IND09	37/5.86	For evaluating the consequences of impacts or the adequacy of the design to resist aircraft impacts, only realistic crash scenarios should be considered, which may require the knowledge of such factors as the possible angle of impact, velocity or the potential for fire and explosion due to the aviation fuel load. In general, fire cannot be ruled out following an aircraft crash, and so the establishment of specific requirements for fire protection and for emergency preparedness and response will be necessary.	Velocity of aircraft is one of the major parameters for assessment against accidental aircraft crash.	X			
92.	IND10	54/5.14 4	An ageing management programme should be implemented at the design stage to allow anticipating equipment replacements as well as periodic monitoring, repair and rehabilitation of static containment like civil structures.	Ageing management of civil structure is an important part of overall ageing management of plant.			X	The comment is technically correct, however we do not see any reason to explicitly mention one element.

								There are other important elements as well. The suggested addition is included in the AMP.
93.	IND11	Page No. 38 Instrumentation and Control	**Suggestion:** Following text may be added as separate clause to Instrumentation and Control Section: Computer based equipment in safety systems or safety related systems shall be subject to appropriate Independent Verification and Validation Process.	IV & V is important for computer based system used for safety systems.			X	We agree but this is already covered by requirement 44 of SSR-4
94.	IND12	General	**Suggestion:** A clause covering details of Electrical Safety may be included. The following may be utilized appropriately for this purpose: Electrical Safety: All electrical installations should be in conformity with the Standards. All electrical fittings should be provided as per area classification. All transformers should be provided with oil soak pits either below the transformer or outside the transformer room. Sprinkler system should be provided to the transformers wherever necessary considering their capacities and oil content. If two or more transformers are installed side by side,				X	Technically we agree that safety of electrical systems is an essential element. However, this is out of the scope of this SG and also these detailed requirements differ in various countries and

			they should be separated by fire separation walls. Earthing for equipment and metal structure should be provided. Double earthing should be used for the machines operating on electrical power. All cable should be routed neatly and in an orderly fashion through the cable trays. Cable trays should be separated into power cable trays, control cable trays and instrumentation cable trays. Power cable trays should again be segregated based on the voltage grades keeping the cables used for higher voltages on top and lower one at bottom. Cable penetration sealants, fire retardant spray, fire barriers should be used whenever the cables penetrate walls, ceiling or floorings within a plant. The penetration should be closed and sealed with fire retardant sealing material from both sides. In addition, the cables should be coated with fire retardant material on both sides of the penetration. Fire barriers should be provided at appropriate distances. Cable galleries should be provided with fire and smoke detection system. Lightning arresters should be provided at appropriate locations.					are subject to national regulations.
95.	IND13	55/Section 6: Construction	**Suggestion:** Following text may be added to Section 6: Construction on Corrosion Control: After erection of the plant all structures should be properly cleaned and immediately painted with suitable primer followed by appropriate surface treatment. Effect of	Measures should be taken to protect SSCs from any degradation such as corrosion in view of prevailing environmental conditions throughout the construction period.		X		Wording slightly modified and added as a new para.

			nearby industries handling corrosive substances and releasing into environment should also be considered.					
96.	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		We agree in general, however the three guides apply to different facilities with different levels of risk. In line with graded approach the level of details vary between the guides. Also this is a revision by amendment and the scope of amendment was specified in the approved DPP.
97.	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.			X		Yes, this is true, however not necessarily wrong.

			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 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				Safety Guides are built to provide useful guidance 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.

			requirements or relevant paras of another safety standard. We have the same comments on each draft regarding to this aspect.				
98.	JPN03	1.4.	The toxicity of plutonium is high and therefore it is important that best practice be employed at all stages of the fabrication of MOX fuel, and that plutonium including all waste ~~from~~ in MOX fuel fabrication facilities be handled, processed, treated and stored safely.	The meaning could be changed when "from" is applied to "plutonium".	X		
99.	JPN04	1.7.	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 MOX ~~uranium and plutonium mix oxide~~ fuel, storage and reprocessing of spent fuel, associated conditioning and storage of waste, and facilities for fuel cycle related research and development) are established in SSR-4 Ref. [1]. This Safety Guide provides recommendations on meeting these requirements for ~~plutonium and uranium~~ MOX fuel fabrication facilities during their siting, design, construction, commissioning, operation and preparation for decommissioning.	1) This description is commonly appeared in three draft documents (para.1.5 of DS517A, para.1.5 of DS517B and para.1.7 of DS517C), and it would be preferable to add "deconversion", even though "deconversion" is not addressed in this draft document to keep consistency among three draft documents. This addition of "deconversion" is also proposed in other two draft documents (DS517A and DS517C). Concerning deletion of "plutonium and uranium", MOX is already defined in Para. 1.5, and thereafter MOX may be used.	X		
100.	JPN05	2.4. / 2.5.	2.5. For the MOX fuel fabrication process to remain in a safe state also when stopped (i.e. there is no movement or transfer of material), the ~~2.5.~~ following systems should continue to operate:	Correction. The para. 2.5 does not start from proper location.	X		
101.	JPN06	3.5. / Line 3	However, taking into account the specific hazards of a MOX fuel fabrication facility,	Typo.	X		

			the potential for grading should be limited (see para. 4.4. 4.3).					
102.	JPN07	3.20. (3)	(3) Fire safety programme — Testing of fire detectors, ventilation dampers, spark arrestors, maintenance of fire barriers; — Mitigation based on extinguishants compatible with criticality safety and ventiration control of pressure differentials;	It is important to maintain a containment of glovebox against pressure rise by release of extinguishing gas.	X			
103.	JPN08	4.1./ Line 7 (Last sentence)	Requirements for site evaluation for MOX fuel fabrication facilities are provided in IAEA Safety Standards Series No. SSR-1, Site Evaluation for Nuclear Installations [12] and further guidance is provided in SSG-35, Site Survey and Site Selection for Nuclear Installations [13].	Editorial.	X			
104.	JPN09	4.5.	The density and distribution of population in the vicinity of the MOX fuel fabrication 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 radioactive material and hazardous chemicals.	Completeness. In the site evaluation, in addition to the release of radioactive substances, the hazardous chemicals is also included.	X			
105.	JPN10	5.1. /Line 5	The main safety functions are those designed for: (1) ~~Confinement and cooling of radioactive material and associated harmful materials~~ Maintaining subcriticality of fissile material; (2) ~~Protection against radiation exposure~~ Confinement and cooling of radioactive material and associated harmful materials;	Match the order of “safety functions” to the order in Para. 5.2 and ANNEX II and III.		X		The list of functions was deleted from here, reference to SSR-4 is provided instead as in SSSG 5 and 6.

			(3) ~~Maintaining subcriticality of fissile material~~ Protection against radiation exposure.					
106.	JPN11	5.2. 5.3.	5.2. The requirements on maintaining subcriticality are established in requirement 38 and para. 6.138 – 6.156 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]. 5.3. 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 Appendix II 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].~~	Correction. Since this is a description of subcriticality, move to Para. 5.2.	X			
107.	JPN12	5.4.	The requirements on protection against external radiation exposure are established in requirement 36 and para. 6.129 – 6.134 of SSR-4 [1].	The description in this paragraph is about 'external radiation exposure', so there is no need to delete 'external'.	X			
108.	JPN13	5.11. /Line 3	In order to accomplish the calculated value of the effective multiplication factor (k~~eff~~$_{eff}$ including all uncertainties and biases) which mainly depends on …	Use subscript.	X			
109.	JPN14	5.12.a)	The criticality safety in a MOX fuel fabrication facility one or more of the following parameters of the system should be kept within subcritical limits: a) PuO_2 (~~input~~ receipt) (i) Mass and geometry (limitation of the dimensions or shape) in accordance with the	Clarification. In order to make clear the definition of "geometry" in this paragraph, the supplementary explanation should be added as shown on the left (the same description exists in para 5.12 of DS517B).	X			

			safety specification of PuO_2 isotopic composition and moderation.	Match the headings from a) to c) with Para. 5.13.				
110.	JPN15	5.12.b)	b) UO_2 (~~input~~ receipt) Mass and geometry in accordance with the safety specification of UO_2 isotopic composition and moderation.	Match the headings from a) to c) with Para. 5.13.	X			
111.	JPN16	5.12. c)	c) MOX powder MOX powder (receipt or preparation) is formed in the fuel fabrication process, and the associated criticality hazard ~~shall~~ should be assessed in accordance with the isotopic specification and the PuO_2 content at each stage of the process. Mass, geometry and moderation ~~shall~~ should be considered.	Match the headings from a) to c) with Para. 5.13. Editorial.	X			
112.	JPN17	5.13. b)	— The isotopic composition of the uranium i.e. the ratio of the amount of ^{235}U to the total amount of uranium ($^{235}U/U_{total}$). When this ratio is less than 1%, and given that there is no heavy water (D~~2~~$_2$~~0~~O) present in the facility, no criticality hazard is to be considered; — The amount of moisture (degree of moderation), for control of criticality on the next stages of the MO~~x~~X fuel fabrication process;	Use subscript. Typo.	X			
113.	JPN18	5.18./5th bullet	— Moderation. Water, oil and other hydrogenous substances such as additives are common moderators that are present in MOX fuel fabrication facilities or that may be present in accident conditions (e.g. water from firefighting).	Clarification. In order to make clear the definition of “other hydrogenous substances” in this paragraph, the supplementary explanation should be added as shown on the left.	X			
114.	JPN19	5.18./7th bullet	— *Neutron absorbers.*	UO_2 with gadolinium pellets and rods are partially used for assembling, in	X			

			The neutron absorbers that may be used in MOX fuel fabrication facilities include cadmium, gadolinium and boron and the safety analysis should incorporate their effect as neutron absorbers; however, ignoring their effects would yield conservative results. The use of mobile neutron absorbers should be avoided.	particular BWR MOX fuel assemblies.				
115.	JPN20	5.19.	For processes in which radioactive fissile material is handled in a discontinuous manner (batch processing), the process and the related equipment should be designed to ensure that radioactive fissile material is transferred only when the limits defined for the next process are satisfied.	Since it is a discussion of criticality, it is better to use clearer terms.	X			
116.	JPN21	5.28.	Last stage filters are used to protect the public and the environment and are normally located close to the location at which discharges to the environment occur. Last stage filters are discussed in para. 5.32 5.35-5.36..	Correction.	X			
117.	JPN22	5.34.	For normal operation, the need for the use of protective respiratory equipment should be minimized through careful design of the static and dynamic containment systems and of devices for the immediate detection of low thresholds of airborne radioactive material. The use of protective respiratory equipment for normal operation should be used only as a complementary mean of protection in addition to existing barriers (para.?? 4.109 of SSR-4 [1]).	Correction is necessary. Para.4.109 doesn't exist in SSR-4.	X			
118.	JPN23	5.70.	The irradiation of organic or hydrogenated substances by plutonium, or and resulting the decomposition of molecules, may lead to the	Clarification of results (Radiolysis) associated with irradiation.	X			

			generation of gas, especially the release of hydrogen.					
119.	JPN24	5.97.	~~for~~ ~~t~~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		The second addition not included, details are provided in the specific GSR Part 4.
120.	JPN25	5.101.	A best estimate approach with the use of ~~conservative~~ adequate margins may also be used in the safety analysis.	The margins in the best estimate is not limited to being conservative.	X			
121.	JPN26	5.119.	The magnitude and severity of conditions considered in DEC (Design Extension Conditions) as well as the acceptance criteria used for acceptability of consequences of DECs should be accepted by the national regulatory body.	Add definition of the abbreviation for DEC.	X			
122.	JPN27	5.120.	Useful guideline for assessing the acute and chronic toxic effects of chemicals used in MOX fuel fabrication facilities is provided Ref. [1~~5~~].	Missing reference and specify relevant paras using "should" statement. There are no recommendations in this para.	X			
123.	JPN28	5.122.	For safety, environmental and economic reasons, the aim of radioactive waste management is to minimize the generation of waste (see ~~GSR Part 5 [18], Requirement 8~~ SSR-4 [1], Requirement 24). The main type of waste encountered in MOX fuel	Better reference for design requirement here, instead of GSR Part 5 as predisposal requirement.	X			

			fabrication facilities is material contaminated with plutonium (from PuO2 or MOX). The following aspects should be considered in the design:					
124.	JPN29	5.122. a)	a) Generation of waste. — The waste generated in a MOX fuel fabrication facility is mainly solid waste ~~(see para. 1.8)~~. A record keeping system should be implemented to ensure the proper identification, traceability and documentation of the radioactive waste generated.	There is no description concerning the solid waste at para. 1.8.	X			
125.	JPN30	5.122. c) / Line 9	— Consideration should be given to criticality control and radiation exposure of the personnel ~~operator~~ when a number of bags of waste are collected.	Consistency of wording. (see para.5.33 and 5.100)				
126.	JPN31	5.132.	To facilitate the construction and commissioning of a MOX facility in line with requirement 29 of SSR-4 [1], the modularization of SSCs (structures, systems and components) should be considered. Modularization enables manufacturers of SSCs to pre-assemble parts of the production line out of the facility site in better space conditions and using specific tools and equipment and to perform initial tests of the SSCs. This helps the installation on site and reduces manufacturing deficiencies of the SSCs before their transport on facility site.	Add definition of the abbreviation for SSCs.		X		SSC replaced with full text everywhere.
127.	JPN32	6.3. / Line 2-3	This enables equipment to be tested and proved at manufacturers' shops before its installation at the MOX fuel fabrication facility (see para. 5.132. ~~5.136~~).	Typo.	X			

128.	JPN33	7.3.	During commissioning and later during operation of the facility, the estimated doses to personnel that were calculated should be assessed against actual dose rates. If, in operation, the actual doses are higher than the calculated doses, corrective actions should be implemented, including making any necessary changes to the licensing documentation (i.e. the safety ~~case~~ analysis report) or adding or changing safety features or work practices (see also Section ~~7~~8).	Safety analysis report is generally used. The same wording is found in para. 5.121.	X			
129.	JPN34	8.32.	The management system for a MOX fuel fabrication facility should include a standard process for all modifications (see para. 3.6. ~~3.8~~).	Typo.	X			
130.	JPN35	8.44. 8.45.	~~8.44. Criticality hazards may be encountered when carrying out maintenance work. Waste and residues arising from decontamination activities should be collected in containers with a favourable geometry. Maintenance instructions and/or procedures for installations that possibly contain fissile material should be reviewed and approved by criticality safety staff before the work can be started. Special care should be taken to ensure the proper spacing of vessels or installation parts that may contain enriched material.~~ 8.45. Criticality hazards may be encountered when carrying out maintenance work. Waste and residues arising from decontamination and maintenance activities should be collected in containers with a favourable geometry approved for the work, and should be stored in dedicated criticality safe areas. Maintenance instructions and/or procedures	Para. 8.44 and 8.45 are very similar. Unification of both paragraphs is necessary as suggested.	X			

			for equipment or installations that possibly contain fissile material should be reviewed and approved by criticality safety staff before the work ~~starts~~ can be started. Special care should be taken to ensure the proper spacing of vessels or installation parts that may contain enriched material.					
131.	JPN36	8.54.	The doses caused by plutonium are dependent on the proportion of ^{238}Pu and ^{241}Pu (^{238}Pu~~-238~~ has a short half-life and ^{241}Pu~~-241~~ decays to ^{241}Am).	Duplication.	X			
132.	JPN37	8.79.	Gaseous radioactive discharges should be treated, where appropriate, by means of HEPA filters or equivalent (see para. 5.124. ~~5.125~~).	Typo	X			
133.	JPN38	8.62./Line 3	Radioactive sources are used in a MOX fuel fabrication facility ~~e.g. to~~ for scanning rods, and in the laboratory.	Appropriate expression.	X			
134.	JPN39	9.1.	Requirements for the preparation of safe decommissioning of a MOX fuel fabrication facility are established in ~~of~~ SSR-4 [1] para. 10.1 – 10.13, and in the IAEA Safety Standards Series No. GSR Part 6, Decommissioning of Facilities [31], Sections 2 to 7.	Typo.	X			
135.	JPN40	9.4. d)	d) Determination of ~~methods of~~ decontamination methods of the facility to reach the levels required by the regulatory body for cleanup operations or the lowest reasonably achievable level of residual contamination.	Proper expression ("of" is too long).	X			
136.	JPN41	ANNEX II and III	Use (1) to (3) in "Safety function" column in the Table.	Correction to avoid confusion.	X			

				It is confused if 1 to 3 of “Safety function” column is not set to (1) to (3).				
137.	RUS01	1.7	First sentence should be aligned with para 1.3 SSR-4 or excluded.	Compliance with SSR-4	X			
138.	RUS02	1.11	This publication includes specific **recommendations** ~~elements of~~ for ensuring criticality safety in a MOX fuel fabrication 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			
139.	RUS03	Title of Chapter 3	MANAGEMENT **FOR** ~~AND VERIFICATION OF~~ SAFETY	This Chapter doesn’t address recommendations related to verification of safety and related to safety assessment and periodic safety review as established in relevant Chapter of SSR-4. The section “Verification of safety” addresses safety programms that relevant rather to Chapter “Operation” as provided in relevant Chapter of SSR-4.		X		Changed to “Management system for MOX fuel fabrication facilities”
140.	RUS04	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			
141.	RUS05	4.2	The scope of the site evaluation for a MOX fuel fabrication facility **is established by** ~~should in line with~~ requirements 3 of SSR-1 [10] and requirement 11 of SSR-4 [1] **and**	The requirements SSR-4 **shall be met** not **should**	X			

			should reflect the specific hazards listed in Section 2 of this Safety Guide.					
142.	RUS06	4.8	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			
143.	RUS07	5.11	The aim of the criticality safety analysis is to demonstrate that **the safety measures are** ~~design of equipment/facility is~~ such that the values of controlled parameters are always maintained in the subcritical range.	The term *safety measures* are more general.		X		Design of equipment and related safety measures…
144.	RUS08	5.16	Edit paragraph: The use of a conservative approach, with account taken of: • uncertainties in physical parameters, the physical possibility of optimal moderation conditions and the potential of non-homogeneous distributions of moderators; • *optimal geometry configuration of a system with fissile material;* • Plausible operational occurrences and their combinations if they cannot be shown to be independent; • Operational states that may result from external hazards.	The exact geometry configuration of system with fissile materials is tend to be unknown. In order to be conservative the optimal (worst) geometry configuration of a system should be considered in analysis (like sphere).	X			
145.	RUS09	5.21	Edit item d) The need to ensure that all static barriers, including any filters or other effluent control equipment, can withstand the maximum differential pressures and airflows generated by the system, *including increasing the filter resistance during operation and considering*	Ventilation system project must provide design value of air flow, taking into account the influence of such effects as increasing filter resistance during operation, as well as the dependence of air flow on meteorological conditions	X			

			conservative assumptions regarding the meteorological conditions.					
146.	RUS10	5.26	Add item *Procedure and instrumental means to control the potential buildup of plutonium powder or MOX powder particulates in the ventilation ducts* *should be established.*	Project of the facility should provide the possibility and means for early detection of potential buildup of nuclear materials in the equipment of ventilation systems.	X			
147.	RUS11	5.42	Fire hazard analyses **of the facility should give particular consideration** ~~should at least be carried out~~ for the **areas**: …	Fire hazard analysis is performed for the whole facility	X			
148.	RUS12	5.71	~~The list of specific external hazards for a MOX fuel fabrication facility should include those identified in the following paragraphs under appropriate headings.~~	This list is neither complete nor necessary		X		Changed to “Examples of…”
149.	RUS13	Section SAFETY ANALYSIS	The Section should be revised to bring into compliance with relevant requirements of SSR-4.	Compliance with SSR-4		X		
150.	RUS14	5.96	~~The risk assessment of the MOX fuel fabrication 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		Changed to “safety assessment”
151.	RUS15	5.109	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.

152.	RUS16	MANAGEMENT OF RADIOACTIVE WASTE ~~AND EFFLUENTS~~	Propose to delete	There are no recommendations related to effluent management in this section.	X			
153.	RUS17	5.125	~~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			
154.	RUS18	5.126	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		See the modified text
155.	RUS19	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			
156.	RUS20	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			
157.	RUS21	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		X		“…to promote and further enhance…”

				behaviours and attitudes…” during commissioning phase), modified or deleted.				Commissioning is an important milestone when operating personnel gains its values and attitudes of the organization for the whole operation.
158.	RUS22	8.16	Examples of **operational limits** and ~~limiting~~ conditions for safe operation (SSR-4 [1], para. 9.31) for a MOX fuel fabrication facility such limits are:…	The list include examples both operational limits and conditions		X		Limits on operating parameters
159.	RUS23	8.19	~~For anticipated operational occurrences, design basis accidents and design extension conditions without significant facility damage the operating procedures should provide instructions for the return to a safe state.~~	Propose to delete this provision because of its incorrectness.	X			
160.	RUS24	8.33	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 specific recommendation .	To keep the logic.	X			
161.	RUS25	8.39	Modifications performed on ~~structures, systems and components~~ **design, layout or procedures of the facility** might negatively	Propose to make the provisions more general.	X			

			affect security **arrangements** ~~equipment~~ and vice versa. For example, malfunction of safety equipment may damage nearby security equipment.					
162.	UK01	Para 1.4 Line 1	Add '<u>where possible</u> best practice'	UK law requires good practice and reasonable practicability	X			
163.	UK02	Para 1.7 Line 3	Mixed oxide fuel	Typo	X			
164.	UK03	Para 1.15 Line 12	<u>Solid</u> waste and effluents	Effluents in your text appears to be used to indicate liquid and gaseous radioactive waste but this is not clear as effluents in UK can include non-radioactive wastes			X	It is preferred to keep "waste" as generally any type of waste here in this section as this is an introductory paragraph.
165.	UK04	Para 1.15 Line 14	Add mention of decommissioning	Decommissioning should be considered in design as well			X	Decommissioning is out of the scope of SSG-7
166.	UK05	Para 2.5 Line 3	Prolonged stoppage should recognize alpha decay also generates helium	Alpha decay generates helium which would be a factor if the containment was sealed and the stoppage prolonged	X			
167.	UK06	Para 3.20 Line 31	Add <u>succession</u> planning		X			
168.	UK07	Para 4.1 line 6	Add floods	The significance of water moderation and MOx plants would strengthen the	X			

				need to ensure it is mentioned at all possible locations				
169.	UK08	Para 4.3 Line 2	Add ‘ where a dry process is used’	This document now specifically excludes wet MOx processes	X			
170.	UK09	Section 5	Suggest that somewhere in this Section a requirement is established to design out any potential for unrevealed adventitious accumulations of fissile material, but in any locations where this is possible to flag such locations and to put in place a routine inspection and clean-out regime.	Unrevealed accumulations of fissile material have a clear potential to challenge criticality safety over the longer term operation of the plant.		X		The provision was added to section 8 as it relates to periodic inspections.
171.	UK10	5.4	Suggest eye dose is also added to whole body and hand doses.	Whole body exposures and exposures to the hands are mentioned, but recently there has been more of an ICRP focus on eye doses and a consequent reduction in legal limits for eye lens exposure.	X			
172.	UK11	5.13 (a) and (b)	Suggest that a comment is added to stress the importance of confirming (e.g. via measurement or analysis) the assumed Pu isotopics being fed to the process and the assumed U enrichment (for U at less than 1 wt% U-235, no criticality hazard need be considered only if there is no credible potential for this enrichment value to be exceeded).	Feeding of out of specification fissile feedstock to the MOx fabrication facility has a potential to challenge the Operator’s criticality safety case and hence needs careful consideration within the criticality safety assessment.		X		The existing text includes the isotopic composition of both Pu and U. Additional guidance on criticality prevention is also provided on other places in the document so the comment is covered.

173.	UK12	Para 5.22 Line 4	Replace scarp with scrap	typo	X			
174.	UK13	Para 5.24 Line 4	Add “the operation and maintenance should be designed, where ever practicable, such that primary containment does not need to be breached in order to carry out the activities associated with them”	Experience has shown that this is a factor that can be overlooked and should be highlighted here	X			
175.	UK14	Para 5.26 line 4	Add “filtration should be provided at ventilation inlet points to prevent the loss of particulates due to reverse or static flow conditions in the event of a failure of ventilation”	Experience has shown that this is a factor that can be overlooked and should be highlighted here	X			
176.	UK15	Para 5.52 line 6	Add “The monitoring of oxygen within inerted gloveboxes is also a requirement as oxygen is required to also initiate and explosion”	The explanation of fires and explosions appear throughout this document not to recognize oxygen as the other component in the explosion and the need to suppress in-leakage into inerted gloveboxes operated under depression	X			
177.	UK16	Para 5.58 line 4	Add “In the case of the potential for flooding, leakage or spillage the design should encompass the capability to monitor and or detect these perhaps by introduction of a sump and level monitor”	Leak detection is a safety feature essential for gloveboxes that may see accumulations of liquor		X		See 5.65
178.	UK17	Para 5.61 Line 10	Add “and liquid accumulation	As point 13			X	The suggested addition is unclear.
179.	UK18			The pressurisation caused by alpha decay generating helium in a sealed	X			

		Para 5.70 Line 1	New text is required on alpha decay generating pressure in a sealed system in addition to radiolytic hydrolysis	container and potential for water evaporation due to radiolytic heat generation have not been presented for consideration.				
180.	UK19	Para 5.74 Line 3	Add “e.g. overtopping or failure of a river levee”	Significant numbers of incidence of these in recent years warrants a specific highlight		X		We believe this is included in the current text as “flooding”.
181.	UK20	Para 5.91 Line 7	Add “and in the design of the gloveboxes for both operation, where relevant, and maintenance.	This is key to achieving glovebox operability		X		This section is about Control rooms and panels. The proposed addition is already covered in section “Human factor consideration”.
182.	UK21	5.92 (5)	See comment (10) on eye lens dose	See comment (10)	X			
183.	UK22	Para 5.92 Line 16	Add “in-leakage gas concentration”	You are more likely to detect small quantities of impurities in bulk gas than measure the concentration of the bulk.	X			
184.	UK23	Para 5.92 Line 56	Add “and oxygen”	As above there is a requirement for oxygen to generate the explosion or fire	X			
185.	UK24		Add text on Human factors and ergonomics			X		The proposed

		Para 5.96 Line 3		There is a need to ensure Human Factors and ergonomics are taken into account when designing gloveboxes for normal operations (including maintenance)				addition is already covered in section "Human factor consideration
186.	UK25	5.100	Consideration of likely personnel dose accrual during plant maintenance operations appears to be missing. Operational experience from other similar facilities should be used as far as possible to estimate how the plant's annual dose budget may change with time and to highlight any design improvements that could be made to try to reduce any potential operator/maintainer dose accrual.	Maintenance dose accrual is likely to prove a significant proportion of the plant's annual dose budget, particularly as the plant ages and radioactive contamination within the gloveboxes and plant items accumulates.			X	This section addresses the assessment of DBAs.
187.	UK26	Para 5.121 Line 1	Add solid waste throughout this section where waste is referred to	This section appears to separate radioactive waste in liquids from solid waste			X	We believe it is not needed. The meaning follows from the context and it is specified, where necessary.
188.	UK27	5.122 (c)	Suggest advice is provided as to how to assign a Pu mass value to waste packages at the point of creation – i.e. the assumption appears to be that all assay will be at a central collection point. It is good practice, unless a justification can be provided as to why these cannot reasonably be done, to provide some indicative assay measurement at the point of	Failure to conduct any assay at the point of waste creation poses a risk of creation of waste packages with a mass above allowable assessed safe limits, which would be unrevealed until assay at the central location. This has a potential to reduce criticality safety margins and would	X			A new bullet was added.

			creation of the waste package and prior to aggregation with other waste packages at the central assay point?	entail additional handling of the package e.g. to post it back into a glovebox environment for package break-down/re-packaging.				
189.	UK28	Para 5.123 Line 1	Change gaseous and liquid release to gaseous and liquid wastes or effluents	This section does not discuss release which is an accidental occurrence but discharges that are engineered	x			
190.	UK29	5.130	Suggest an extra point that clear signage should be in place and where practicable, access barriers, to prevent access to the vicinity of gloveboxes where dose rates are known to be high during periods where operations in these gloveboxes are not in progress.	Inadvertent loitering of workers in elevated dose rate fields could increase worker dose burdens and it is important to flag such areas and if possible prevent access to such areas outside of normal production requirements.	X			
191.	UK30	Para 5.133 Line 3	Add "Modularisation should also consider the ergonomics of operation and maintenance of the facility, especially gloveboxes, when they are in the installed in-place configuration e.g. restrictions from walkways, corners	Experience has shown that often modularisation misses in-place challenges		X		Suggested provisions about modularization and ergonomic are already provided in previous paragraphs.
192.	UK31	Para 5.134 line 12	Replace minimise with "avoid wherever possible"	Sharps should not be present within a glovebox if possible to remove	X			
193.	UK32	5.134	Suggest a new point is added to advise that fissile material stocks in gloveboxes should be kept to the minimum required for production purposes and should not be allowed to become temporary ad-hoc storage areas for fissile material. Waste items should also be removed as soon as reasonably	Excess fissile material stocks and/or waste items can pose a challenge to criticality safety and can also lead to additional worker dose accrual, in addition to operability issues.		X		This is implicitly covered by 5.101

			practicable and should not be permitted to accumulate in the glovebox work stations.					
194.	UK33	Para 5.135 Line 1	transportation should engage / consider both security and safeguards during the design phase and ensure that wherever possible all requirements are met	This appears to be missing from inside the guidance although mentioned at the beginning		X		Considering security aspects is addressed in general in earlier sections. Safeguards aspects are out of the scope of this SG.
195.	UK34	Para 5.144 Line 1	Ageing within gloveboxes should consider potential for increased radiation if contamination levels of plutonium rise within the glovebox interior	Learning from experience			x	The comment is unclear – does it mean that the ageing of gloveboxes is faster with higher radiation levels?
196.	UK35	Para 5.147 Line 1	There is a need to address the safe decommissioning of the equipment. e.g. ensuring that equipment can be dismantled in the glovebox and posted out rather than relying on destructive techniques e.g. cutters and saws.	Learning from experience	X			
197.	UK36	Section 7: Commis sioning	Suggest inclusion of a clear statement to require a demonstration of the optimum positioning of airborne contamination detection equipment during the	Incorrect positioning of such instrumentation has a potential to fail to promptly detect radioactive	X			

			commissioning phase i.e. to demonstrate that the on plant airflows are well understood and that the instrumentation has been located at the optimum locations to promptly detect any release of radioactive material from the primary containment.	releases and hence to alert the operators.				
198.	UK37	Para 7.2 Line 14	Add “Operating procedures (including those for maintenance)”	Maintenance is often forgotten if not specifically identified	X			
199.	UK38	Para 7.5 Line 2	Lessons learned should also be sought and addressed in the design phase -			X		We agree. This is part of the management system (Section 3). Operating Experience Feedback provisions follow the structure of SSR-4.
200.	UK39	Para 8.11 Line 3	Add “and where relevant safeguards”	Missing			X	Safeguards-related activities are out of the scope of this Safety Guide.
201.	UK40	Para 8.16 Line 8	Add “ and maximum oxygen and moisture concentrations in inerted gloveboxes”		X			

202.	UK41	Para 8.16 Line 13	Add “impact of inert gas releases to the operator environment on personnel safety. Particularly in the inert gas supply areas”	Conventional hazard of operations was missing			X	The list provides examples only and contains already good range of those.
203.	UK42	8.16	Suggest the addition of allowable quantities of liquid moderator at each of the process work stations.	Control of liquid moderator is important to criticality safety in a dry (powder) fissile material processing facility.	X			
204.	UK43	Para 8.21 Line 2	Add “safeguards”				X	Safeguards-related activities are out of the scope of this Safety Guide.
205.	UK44	8.25	Suggest text is added to reflect that completion of periods of maintenance provides an opportunity for the conduct of a Review Learn and Improve (RLI) exercise to provide improvements in the delivery of future maintenance activities.	Plant operation should be in a climate of continuous improvement.			X	RLI is not a concept used by the OAEA Safety Standards. General provisions ensuring similar objective are existing in Management System Section and

								related standards.
206.	UK45	8.25	The recording of quality information on plant condition encountered during maintenance is of importance – i.e. what was found and how specifically was it fixed. In addition maintenance instructions, where numerical values of parameters have to be measured and recorded, should be quite clear as to the pass/fail criteria.	Experience over inspections of a number of UK Operators has indicated that this is an area that could benefit from considerable improvement and additional guidance – often the information fed back by maintainers is of poor quality and is too brief or in the worst cases is missing or unintelligible.			X	The proposed provision seems to be a bit unclear. What is meant by "recording of quality information" ?
207.	UK46	Para 8.26 Line 6	Add " Particularly to ensure the removal of the presence of asphyxiant gases"		X			
208.	UK47	Para 8.45 Line 2	Add "The potential effect of moderation by the human body should be accounted for when considering the spacing of equipment.		X			
209.	UK48	8.63	Again consider flagging the need for monitoring worker doses to the lens of the eye.	See comment (10)	X			
210.	UK49	Para 9.5 Line 2	Add "design"	UK regulations require a decommissioning plan to be considered within the design phase			X	We agree that the decom. plan is developed during the design stage, but the provision related to the revision of the plan.

211.	UK50	contributors	Revise this list as some contributors have come forward from the previous version	UK contributors from the previous revision are identified, and shown as working for organisations that do not exist in the same form. For example. BNFL no longer exists for instance		X		Yes, this is true. As this is only a revision of the SG we prefer to keep the list of the original contributors and add those who contributed to the revision.
212.	UKR01	Contents, pages 3 and 4	Scope (1.7-1.1***<u>4</u>***) Structure (1.1***<u>5</u>***) ***<u>~~Preparatory steps~~</u>*** The decommissioning plan (9.4-9.5)	Paragraphs referenced incorrectly.	X			
213.	UKR02	Annex II	ANNEX II ***<u>EXAMPLES OF</u>*** STRUCTURES, SYSTEMS AND COMPONENTS IMPORTANT TO SAFETY AND POSSIBLE CHALLENGES TO SAFETY FUNCTIONS FOR MOX FUEL FABRICATION FACILITIES	The title of the Annex does not correspond to the Contents.		X		We believe it does. Adding “Examples” means the list is not exhaustive.
214.	UKR03	§1.7	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	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 ***<u>processing of natural ore</u>*** and waste disposal facilities are	X			

			research and development) are established in SSR-4	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***."				
215.	UKR04	§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			
216.	UKR05	§5.12	"For the prevention of criticality by means of design, the double contingency principle shall be the preferred approach" (SSR-4 [1], para. ***6.142***).	Wrong reference to the cited text.	X			
217.	UKR06	§5.34.	For normal operation, the need for the use of protective respiratory equipment should be minimized through careful design of the static and dynamic containment systems and of devices for the immediate detection of low thresholds of airborne radioactive material. The use of protective respiratory equipment for normal operation should be used only as a complementary mean of protection in addition to existing barriers (para. ***9.100*** of SSR-4 [1]).	Wrong reference to para. 4.109 of SSR-4.	X			
218.	UKR07	§5.48	Extinguishing devices, automatically or manually operated, with the use of an adequate extinguishing material should be installed in areas where a fire is possible and	1) "Plutonium" should be in lowercase. Given the risk of criticality, uranium should not fall out of sight.	X			

			where the consequences of a fire could lead to the dispersion of ***plutonium*** contamination outside the first static barrier. The installation of automatic devices with water sprays should be avoided for areas where ***uranium***, plutonium and/or mixed oxide may be present, with account taken of the risk of criticality. Extinguishing gas may be used in the event of a fire breaking out in a glovebox.					
219.	UKR08	§5.60.	Where spillages in quantities that could be significant from the standpoint of criticality safety are possible (as for example ingress of water from condensed humidity through ventilation systems), consideration should be given to installing design features to prevent water or moderator intrusion. ***In addition, it is recommended to provide an installation of drainage and water detectors in such compartments.***	It is recommended to install water drainage and water detectors to inform the personnel in a case of failure of design features. It is better to prevent the criticality, than to mitigate its consequences.		X		
220.	UKR09	§5.72, e	The effect on criticality safety functions such as geometry and/or moderation ***and reflection*** of the following: — Deformation (geometry control); — Displacement (geometry control, fixed poisons, ***neutron interaction***); — Loss of material (geometry control, soluble poisons ***or neutron absorbers***).	An addition to the effect of earthquakes on criticality safety functions.	X			
221.	UKR10	§6.3.	MOX fuel fabrication facilities are complex mechanically and, as such, modularized components should be used in their construction. This enables equipment to be tested and proved at manufacturers' shops before its installation at the MOX fuel fabrication facility (see para. ***5.132***). This will also aid in the commissioning,	Wrong reference to the paragraph.	X			

			maintenance and decommissioning of the facility.					
222.	UKR11	§8.13	Since the number of operational limits and conditions may be large for a MOX fuel fabrication facility, these could be grouped by topic or activity. ***<u>Examples of structures, systems and components important to safety that may be used when defining operational limits and conditions for each process area are presented in Annex II.</u>***	There are no parameters in Annex II and there is no column 5 of Annex II, as it is stated in para 8.13. The possible change to the text of paragraph is proposed.	X			
223.	UKR12	§8.33	The management system for a MOX fuel fabrication facility should include a standard process for all modifications (see para. ***<u>3.15</u>***).This process should use a modification control form or equivalent management tool. 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. The safety of modifications should be assessed for potential hazards during installation, commissioning and operation. Decision making relating to modifications should be conservative.	Wrong reference to the paragraph.	X			
224.	UKR13	§§8.45, 8.46	8.45. Criticality hazards may be encountered when carrying out maintenance work. Waste and residues arising from decontamination ***<u>and maintenance</u>*** activities should be collected in containers with a favourable geometry ***<u>approved for the work, and should be stored in dedicated criticality safe areas.</u>*** Maintenance instructions and/or procedures for installations that possibly contain fissile material should be reviewed and approved by	Paragraphs are almost identical. The merging is proposed and presented. “8.45. Criticality hazards may be encountered when carrying out maintenance work. Waste and residues arising from decontamination activities should be collected in containers with a favourable geometry. Maintenance instructions and/or procedures for	X			

			criticality safety staff before the work can be started. Special care should be taken to ensure the proper spacing of vessels or installation parts that may contain enriched material.	installations that possibly contain fissile material should be reviewed and approved by criticality safety staff before the work can be started. Special care should be taken to ensure the proper spacing of vessels or installation parts that may contain enriched material. 8.46. Criticality hazards may be encountered when carrying out maintenance work. Waste and residues arising from decontamination and maintenance activities should be collected in containers with a favourable geometry approved for the work, and should be stored in dedicated criticality safe areas. Maintenance instructions and procedures for equipment that possibly contain fissile material should be reviewed and approved by criticality safety staff before the work starts. Special care should be taken to ensure the proper spacing of vessels or installation parts that may contain enriched material.”				
225.	UKR14	§8.55.	The doses caused by plutonium are dependent on the proportion of ^{238}Pu and ^{241}Pu (^{238}Pu~~-238~~ has a short half-life and ^{241}Pu~~-241~~ decays to ^{241}Am). This should be controlled by integrity of the first containment barrier, which should be monitored close to the workplace of the operator, by means of continuous air-	Incorrect text	X			

			sampling and routine monitoring for surface contamination.					
226.	UKR15	Annex I		Text of the blocks (contents) of the diagram is out of blocks. Block connections are not correct.	X			
227.	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.
228.	NSGC2	1.114	-	1.8. This Safety Guide does not include **nuclear** security recommendations	X			
229.	NSGC3	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	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	X			

			~~**aspects**~~ **concerns of each discipline regarding** ~~**related to**~~ the management of information ~~**in each discipline**~~.	a special concern to protect **any** information that could be used by malicious actors.				
230.	NSGC4	8.11	Complementary training of safety and security personnel and their mutual participation in exercises of both types should be part of the training programme to effectively manage the interface between safety and security. In particular, personnel with responsibilities and expertise in safety analysis and safety assessment should be provided with a working knowledge of the security requirements of the facility and security experts should be provided with a working knowledge of the safety considerations of the facility, so that **potential conflicts** ~~**contradictory requirements**~~ between safety and security can be resolved most effectively.	Requirements are not contradictory by themselves but they are complementary. The same problems exist within safety: you want closed doors to avoid fire spread while you want quick access through these doors in case of evacuation caused by the same fire. They are more easily managed because the same experts manage both concerns. What can be a problem is bad implementation, with no effective interface management and, sometimes, difficulty to find a practical solution that can meet all requirements.	X			
231.	NSGC5	8.86	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			