TITLE DS360 Draft 1.6 dated 8 July 2014
Safety of Nuclear Reprocessing Facilities – Specific Safety Guide

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: 30/12/2014 pages				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	General	Consider using waste only under the singular form			"Wastes" is the plural of "waste" and both will be used appropriately		
1.	1.2	The safety of nuclear fuel reprocessing facilities1 is ensured by means of their proper siting, design, construction, commissioning, operation ~~including management~~, and decommissioning.	Superfluous	X			
2.	1.6	Dismantling, shearing or decladding and dissolution of spent fuel	Dismantling is the first essential step before the shearing step, specific to the treatment of fast neutron reactor fuel assemblies	X			
3.	1.6	Production and storage of plutonium oxide and uranyl nitrate or uranium oxide	The final conversion of uranium to oxide form is not necessarily performed in the reprocessing plant	X			
4.	2.3	The facility (with any associated effluent treatment facilities) should monitor and report discharges and, ~~as a minimum,~~ comply with all regulatory discharge limits (Ref. [8]) and maintain discharge as low as reasonably practicable.	ALARA should also be mentioned, not only compliance with limits		"….and, as a minimum, comply with all regulatory discharge limits and optimize protection as far as practicable (Ref. [8])."		"Optimization" is the terminology in Ref. [8]. Limits must be complied with irrespective of optimization.
5.	2.3	…to reduce and recycle these effluents as far as possible taking nonetheless into account the risk of creating loops allowing undesirable ions to accumulate in the process	This phenomenon, confirmed by the operating feedback of the reprocessing plants, may have a		"…. as far as practicable, taking account of the possible accumulation of undesirable species or changes in composition of recycled reagents etc. In accordance with the optimization of protection		A more generalized view of the issue including the safety aspect

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			potential impact on corrosion of the constituent materials of evaporators, etc. Such undesirable ions may originate from processed spent fuels, reagents used in processing and related impurities (fluorine, etc.) and corrosion.		specific design provision should be made to ensure recycled materials are safe and compatible with reuse in the facility which may involve the generation of additional effluents."		
6.	2.3	Discharges should be optimized by the addition of specific engineering features to remove and reduce activity and toxic chemicals levels. These processes have to be periodically reassessed on the basis of technical and economic optimisation studies taking into account the best available technologies.	Periodical examination of possible options for managing liquid and gaseous radioactive and chemical effluent streams, as part of the design process. (direct discharge of radioelements and chemicals in the environment versus separation, trapping, immobilization, conditioning, storing and disposal) can be linked to		"… levels. When carrying out a periodic safety reviews past discharge records should be examined thoroughly to ensure that the current engineered provisions and operational practices are optimizing protection as far as practicable. In addition further improvements in process and effluent reduction and treatment technology should be examined for potential improvements."		This is one aspect of PSR, albeit a very important consideration for reprocessing facilities in the context of the optimization of protection. The wording proposed covers the intent of the comment in the framework of PSR.

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			regulations. This examination should be informed by optimisation studies and the constraints relating to the choice of site and the applicable regulatory restrictions, while also managing the risks relating to such new processes and the associated waste. See also 4.2 and 4.142				
7.	2.9	Reliability of process equipment should be ensured by adequate design, specification, manufacturing, storage (if necessary), installation, commissioning, operation, maintenance and facility management supported by the application of a rigorous management system (which provides for quality assurance and quality control) during all the phases of the facilities lifetime.	Management system is broader than quality assurance		Combined with response to Germany #9		See Germany #9 Note: IAEA Glossary: The term *management system* has been adopted in the revised standards instead of the terms *quality assurance* and *quality assurance* programme
8.	2.10	~~The SSCs related to instrumentation and control (facility control system, indicating and recording instrumentation, alarm and communications systems) in addition to those specifically identified as important to safety in the safety analysis are significant to reprocessing facility safety.~~	Superfluous. Why addressing I&C not important to safety?		Note final line is: "…relevant to…"	X	Providing general advice that, in general process monitoring and control instruments should be of 'good quality' even if not designated are "relevant" to overall safety. E.g. poorly instrumented facilities place additional workload on control room personnel
9.	2.12		Why limiting this	X			Ergonomic extended to all aspects

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			consideration of human factors to I&C? Either delete the paragraph or extend it to design of the facility and its SSC.				
10.	2.15	Active heat removal systems for storage or buffer tanks, accountancy vessels or HA waste packages to remove decay heat	More general	X			
11.	3.2	Consider deleting the text related to flooding	External flooding is only one of the external hazards to take into account. Not more specific to reprocessing facility, than others. This hazard is addressed chapter 4			X	The particular aspect identified is considered to be particularly relevant to reprocessing facilities.
12.	4.1	Protection against external exposure; protection against internal exposure is addressed with the safety function related to the confinement of RM.	The safety function is the protection against radiation exposure, both internal and external			X	The (main or overall) safety functions are those from Ref. [1]: Appendix IV: SAFETY FUNCTIONS IV.2. The facility shall be designed to prevent a criticality accident and the accidental release of hazardous materials. The design shall keep radiation exposures from normal operations and accident conditions as low as reasonably achievable. This is the same as the approach in

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							the other Safety Guides supporting Ref. [1].
13.	4.1	**~~Basic~~ safety functions for reprocessing facilities** 4.1. The ~~basic~~ safety functions (Ref. [1]: Appendix IV: para. IV.2) i.e. those functions, the loss of which,	Ref [1] only mentions with "safety functions", not "basic safety functions". The breakdown of main safety functions is different from the one in SSR-2/1. For example, for NPP, decay heat removal is considered as a separate safety function (i.e. not included under confinement). And confinement and shielding against radiation are within the same basic safety function….			X	The terminology, IAEA Glossary, is not used but is implied in the Appendices to Ref. [1]. The 'main safety functions" are those considered relevant and appropriate for reprocessing facilities (See 13), and does not include 'decay heat removal' as a separate (overall) safety function. The breakdown for NPPs is different but does not form part of the Glossary definition but is given as "information".
14.	4.4	For abnormal states the protection of people and the environment should mainly rely on the prevention of accidents, and should they occur mitigation of their consequences, by robust and fault tolerant design providing defense in depth in accordance with a graded approach. These provisions should be supplemented by on- and off-site emergency arrangements to protect human life, health, property and the environment in accordance with	Prevention and mitigation should be considered. Mitigation is not only addressed via on/off-site emergency arrangements:	X			

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		Ref. [9] as a last level of the defense in depth concept.	mitigation is also to be addressed by design…				
15.	4.5	Alpha-activity and neutron emissions ~~including plutonium~~	The sentence is not clear and Pu is not alone as a strong neutron emitter: Cm…	X			
16.	4.7	In large and complex facilities such as reprocessing facilities, the design authority should develop a set of standardized designs and conditions for their ~~use~~ implementation during design and modification of the facility, based upon proven experience that can be applied to a wide range of applications.	Clarification	X			
17.	4.8	Reprocessing facilities ~~are complexity and~~ having long operational life, provisions to allow for on-site repair of major equipment should be anticipated	Clarification		"As reprocessing facilities have long operational lifetimes provisions…."		To combine France #17 and Areva #5
18.	4.11	…will depend on the facility design and national criteria. DBA are the most representative accidents for the facility and are defined for each relevant workshop according to the accidents studied in the safety analysis reports.	More precise definition		A footnote will be added using the Ref. [1] definition: "In the context of nuclear fuel cycle facilities, a design basis accident (DBA) is an accident against which a facility is designed according to established design criteria such that the consequences are kept within defined limits. These accidents are events against which design measures are taken when designing the facility. The design measures are intended to prevent an accident or to mitigate its consequences if it does occur."		To remain aligned with Ref. [1]
19.	4.11	Representative load drop	Load handling risk is particularly	X			

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			important to analyse in a reprocessing plant because a lot of handling operations are performed during normal operation and maintenance.				
20.	4.12	Reprocessing facilities are characterized by a wide diversity of radioactive materials distributed throughout the facility and by the number of potential events that may result in radioactive releases the environment with the potential for public dose. Therefore operational states and accident conditions of each reprocessing facility process should be assessed on a case by case basis (Ref. [1]: para. 6.9 and Annex III: para. III-10 and III-11). When an event may challenge simultaneously several facilities at one site, the assessment should address the implications at the site level in addition to at each facility.	Fukushima lesson learned.	X			
21.	4.12	in radioactive releases to the environment	"to" is missing	X			
22.	4.16	…and to recover the volume of liquid to the primary containment after early detection.	Low leaks have to be detected early by implementing a strengthened monitoring of the primary containment notably to prevent contamination and fissile material accumulation		… retain and detect liquid leakage from process equipment, vessels and pipes and to recover the volume of liquid to the primary containment (Ref. [1]: Appendix IV: para. IV.38) promptly.		Keeping design issues and operator (or automatic) actions separate
23.	4.16	Great care should be taken when dealing with spills or leaks from liquid or solid streams	Leaks of oxide powder (spent fuel		4.27. Similar attention should be paid to those sections of		New paragraph to address issues raised as the issues are similar but

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			or PuO2) have to be also considered		reprocessing facilities handling solid (powder) materials. Designs for the detection of leaks, accumulations of leaked materials and their return to containment or the process pose particular challenges and care should be taken to ensure these designs are based upon well proven designs or subject to rigorous testing in either case commissioning should rigorously test their effectiveness. As far as practicable, considering both risk and the optimization of protection direct, manual actions by operators should be avoided.		not identical to those for liquids
24.	4.19	…the nature of potential airborne contamination (ie the level of permanent contamination and the risk of an occasional contamination)	additional details		i.e. the level of surface contamination and the risk of additional contamination		clarification
25.	4.29	Where easily dispersed radioactive materials are processed, where the main hazard is contamination or ingestion, ~~are processed~~ gloveboxes are often the design solution.	Clarification	X			
26.	4.35 4.36	Consider moving the last sentence of 4.35 at the end of 4.36	4.36 is related to emergency power supply and the best way to ensure that is a passive cooling system	X			
27.	4.37	…A dilution system (air or inert gas)	additional details	X			
28.	4.40	Limiting the source term (as practicable) during operation and maintenance (eg by prior evacuation of sources before a maintenance operation) Distancing the source from personnel (position of work stations, remotely controlled operation, etc.)	additional details	X			

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		Limiting the exposure time of personnel (automation of operation, etc.) Controlling access to areas where there is a risk of external exposure					
29.	4.40	Protection against external exposure	Coherent with 4.1	X			
30.	4.40	The reference to para. 4.5 is not very clear	In 4.5, there is no target defined, just objectives	X	… to maintain doses below the limits given in (Ref. [5]: Schedule III: paras. III.1 and III.2), optimize protection and to meet the objectives identified in para. 4.5 using…		Combining Germany #33 and Russia #16
31.	4.54	effective multiplication factor (keff)	A bracket is missing	X			
32.	4.55	…a safe value as a fraction of their critical value, taking into account, if necessary, the low limit imposed on the poison content (neutron absorbing materials), and demonstrating that…	additional details	X	… taking in to account all, parameters, as necessary e.g. the optimum values for moderation or neutron poisons etc…		Generalization to all parameters
33.	4.56	…to initiate immediate evacuation (to minimize the dose equivalent rates) are necessary are defined according to the workshop layout, to the process and to national safety requirements…	additional details		… (to minimize personnel doses in case of repeat or multiple criticality events)…		clarity
34.	4.58	In reprocessing facilities	Not a F in capital letter	X			
35.	4.59	It may cause a criticality accident	Accident not plural				
36.	4.62	Areas where radioactive material is processed and stored	Consider not limiting to fissile material; a fire could induce a large spreading of radioactive material	X			
37.	4.62	Areas where pyrophoric metal under disperse form is	Metal under		.. powders are…		clarity

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		processed…	compact or massive form is no pyrophoric				
38.	4.64	Of a wide-spread fire	Fire not plural	X			
39.	4.64	Use of flammable liquids or gases outside their flammability limits Separation between combustible materials and ignition sources Insulation of sources of heat Separation between chemically incompatible materials which might cause exothermic reactions Installation of fire detection monitoring system designed to allow earliest detection and localization of any start of fire, quick transmission of the information and activation of the automatic devices of fire-fighting	Additional examples for preventive and mitigation measures	X			
40.	4.64	In any case, the design and the control of the ventilation system should aim at limiting the spread of fire, at maintaining as long as possible the dynamic containment system inside the room involved in the fire and at protecting the last level of filtration. Therefore, the ventilation system should be designed to limit the accumulation of flammable dust and the ventilation ducts should be airtight and resistant to heat and corrosive products that might result from a fire.	Main principles concerning the design of ventilation systems	X			
41.	4.67	Controlling parameters (eg, concentration, temperature, pressure) to prevent situations leading to explosion	Pressure is an important control parameter (eg providing a sufficient off-gas vent to prevent a thermal runaway due to red oil)	X			
42.	4.67	Limitation of the quantity or of the concentration of the explosive fluids	Additional examples for	X			

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		Designing of the ventilation systems in order to avoid the formation of any explosive atmosphere Maintaining the explosive gases concentration below their lower explosive limit in every situation Designing of the equipments or structures to withstand the effects of an explosion	preventive and mitigation measures				
43.	4.69	Limit the consequences of drops and collisions (eg by preferring to handle loads by rolling them on the ground, …, by installing a shock absorbing cushion on the ground) In case of loss of power supply, ensuring the return to a safe state	additional details	X			
44.	4.73	The main preventive measures for the functions requiring electrical power are: using different electric power sources, design of the power supply to withstand external risks, the redundancy and the separation of the various power supplies and using uninterruptible power sources when necessary.	Main principles of prevention relating to the loss of electrical power		Diverse and redundant electric power sources, switching and connections; design of the power supplies to withstand external risks; using uninterruptible power sources when necessary.		
45.	4.73	Heat removal systems	Heat transportation system is not necessary	X			
46.	4.75	The chronology for restoring electrical power to reprocessing facilities should take account of … and of the classification of the electrical receivers (eg normal, back-up supplied or emergency supplied receivers)	additional details	X			
47.	4.77	High reliability of the systems of fluids supply and adequate back up capacity or independent…	additional details	X			
48.	4.82	…,eg operating temperature of evaporators and control of the composition of the recycled effluents, should be adapted to…	Important additional process parameter to consider to control corrosion risk	X			
49.	4. 85	…other equipment important to safety should not be affected by flooding (eg, implementation of drip-trays to	additional details		New 4.53 added and additions to 4.90 to address these issues		4.73 and 4.68 already deals with a number of these issues

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		collect the possible leaks, installation of over flow pipes or alarm of high level on process tanks, layout of the safety components above the maximum water level conceivable in case of pipe failure, separation routing of pipes and electrical systems, etc.)			(combined with France #50)		
50.	4.88	…The main requirements for the prevention of the risks related to the use of hazardous chemicals are the design of the equipment in order to prevent corrosion, the installation of separate drip-trays for incompatible chemicals, the prevention of an accidental formation of a flammable/explosive mixture by maintaining the chemical compounds outside their flammability/explosion limits, the elimination of the causes of inflammation/explosion, the compliance with the regulatory limits in the chemical exposure of the workers, the individual protective equipments of the workers when necessary, etc.	Main principles of prevention relating to the use of hazardous chemicals		See France #49		
51.	4.89	… (eg oversizing with regards to pressure, specific or increased margins, special dispensation if necessary)… …to minimize potential consequences on safety targets.	additional details		… pressure, increased safety margins, special justification for alternative testing regimes etc.) and in operation (e.g. reinforced monitoring of process parameters). A specific safety assessment of proposed alternative testing and operational regime should be made with the objective of demonstrating that the probability of failure and consequences or risk, as appropriate are consistent with the accident criteria for the facility		
52.	4.89	… a detailed seismic assessment should be made of the reprocessing design in order to demonstrate the respect of the requirements related to the safety functions (confinement, sub criticality and radiation protection). In this assessment, loss of cooling and changes in the criticality control mode (geometry, poisoning) must be	Consider not limiting the requirements in the seismic design to loss of cooling and criticality	X			

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		addressed.					
53.	4.89 (para n° and following ones to correct)	…including : seismically induced loss of containment functions (static and dynamic), functions ensuring the return and the preservation of the plant in a safe status after an earthquake (structural functions, auxiliary functions that need to operate in case of SSE, functions of prevention of other risks (e.g. fire, explosion, load drop, flooding) subsequent to SSE)…	Consider not limiting the requirements in the seismic design to loss of cooling	X			
54.	4.92	External fires and explosions is a title		X			
55.	4.93	Consider adding a title: External toxic hazards		X			
56.	4.100	Consider adding the footnote at the beginning of the chapter related to the external flooding hazard: If possible, the nuclear facility is sited above the flood level or at a sufficient elevation and with sufficient margin to account for uncertainties (e.g., postulated effects of global warming) to avoid major damage from flooding	The best way to protect a site is to have a sufficient elevation	X			
57.	4.100	Create a new para. Where dams are up-stream of nuclear sites, consideration is taken of the hazard posed by the dam collapse.	Potential is not necessary Dam collapse is another source of flooding to assess, as extreme rainfall, river flood…		New subsection		
58.	Title before 4.119	HUMAN FACTOR CONSIDERATIONS[38] ~~Human factors in operation, inspection, periodic testing, and maintenance~~	No subtitle needed (current one does not fully reflect the fact that it is to be down at the design stage)	X			
59.	4.141	Due to the nature and diversity of the composition of the spent fuel (structural parts, spectrum of fission and activation products and actinides)…		X			

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60.	5.3	The operating organization ~~should~~ may consider minimizing the number of designers and contractors~~, as far as practicable,~~ for consistency and standardization to support safe and effective operation and maintenance.	Alternate wording offering additional flexibility…			X	unnecessary as this is advice not a requirement
61.	6.6	During commissioning, operational limits and normal values for safety significant parameters should be validated (where established in the safety assessment or set by the regulatory authority), or confirmed.	Clarification		See ENISS #15		
62.	6.7	This type of material may be inadvertently introduced during construction and one of the objectives of the commissioning process is to ~~locate and remove~~ confirm all such foreign material have been removed, whilst enhancing controls to limit further introduction.	FME should be implemented since the construction stage, not only at commissioning.	X			
63.	6.9	If not identical, then the effect of any differences should be ~~rigorously~~ analyzed to determine the potential effects of any minor constituents or contaminants which might affect the integrity of the facility over its lifetime, before approval for use.	Superfluous	X			
64.	6.10	~~Each~~ Some stages of commissioning may require regulatory approval in accordance with national regulations, prior to starting and at completion.	Clarification	X			
65.	6.11		This list is quite limitative. Deletion is suggested or the list should be extended….	X			
66.	6.12	~~Clear and concise~~ communications between management, supervisors and workers (and between and within different shifts of workers under normal and abnormal circumstances and with the relevant emergency services) is a vital component of overall facility safety.	Superfluous. Concision may be conflicting with clarity…	X			
67.	6.16 stage	Regulatory permission to operate the facility is generally	Operating	X			

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	4 i	issued to the operating organization before the start of this stage. In this case, 'hot processing', commissioning will be performed under the ~~responsibility,~~ safety procedures and organization of the operating organization as for a fully operational facility;	organization, as the licence owner, is always responsible…				
68.	6.16 stage 4 iii	For the workforce, the safety culture should be enhanced at that stage so as to ~~ensure~~ <u>further contribute to</u> safe operation;	Safety culture is not the sole aspect for safe operation	X			
69.	7.1	The organization of the reprocessing facility should provide for this need, typically through a consistent and systematic method of approving, planning and coordinating such work (<u>within</u> the management system).	The Management System is broader than that….	X			
70.	7.3	Similar arrangements should be put in place to adopt lessons learned from other organizations which operate reprocessing facilities <u>or other hazardous facilities (e.g. chemical plants)</u>.	Need to expand to other industries where relevant lesson could be learned	X			
71.	7.5	~~Related to the complexity and hazard potential,~~ the operating organization should:	Not relevant for this paragraph	X			
72.	7.5	• Establish and maintain ~~the quality of the~~ <u>appropriate</u> interfaces (field implementation of communication procedures) between:	"quality of interfaces" is not clear	X			
73.	7.11		This list is quite limitative. Deletion is suggested or the list should be extended…. For example, the last bullet of 7.12 could be added.	X			
74.	7.15	Authority to make operating decisions should be assigned to suitable management levels in accordance with <u>the management system,</u> the OLCs and the operational sub-	Management system is also expected to		…the operational sub-limits and the potential safety implications of the decision. The integrated		

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		limits.	describe responsibilities.		management system should specify the authority and responsibilities of each management level and, where necessary individual post-holders.		
75.	7.18	To maximize the benefit of the reprocessing facilities robust design, it is vital that ~~well written and concise~~ user-friendly procedures for the operational state, ramp-up, ramp-down, non-operational and accident conditions should be in place.	Conciseness is not an objective per say.	X	…user-friendly, accurate procedures…		
76.	7.19	~~The~~ documents prepared should also be established to systematically link to the safety case and OL&C to operating procedures to ensure that safety requirements are comprehensively implemented in the instructions.	The link may not be in the procedures themselves but in an interface document…		….systematically link to the safety case and OLCs, either directly or through interface documents, to ensure that safety requirements are comprehensively implemented in the instructions.		
77.	7.24	The management system should include provision for a program of facility internal, audits whose purpose, among others, is to periodically confirm that the facility is being operated in accordance with operating procedures (including its OLCs, its safety case and licence conditions).	Internal audits have several purposes, not only related to implementation of operating procedures (they could address development of operating procedures, experience feedback, deviation management, contracted work…)	X			
78.	7.31	Process should be put in place to ensure that all maintenance activities are reviewed for evidence of	Re-arrangement within the	X			

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		reliability or performance issues. ~~The safety committee should routinely review the reports generated for the most significant SSCs and any other significant findings with consideration of their implications on facility safety.~~ Higher risk, complex or extended maintenance tasks should be regularly reviewed to benefit from lessons learned and to implement constant optimization of doses and environmental discharges. <u>The safety committee should routinely review the reports generated for the most significant SSCs and any other significant findings with consideration of their implications on facility safety.</u>	paragraph to have a more logical order				
79.	7.40	~~The main purpose of the modification control form is to provide the basis for a safety assessment of the modification, especially any changes that may affect radiological or criticality safety.~~ The modification control form should be used to identify all the aspects of safety that may be affected by the modification, especially any changes that may affect radiation protection or criticality safety, (including…) and to demonstrate … -	Consider simplifying the para.	X			
80.	7.48	Consider deleting the first bullet	Idem to the first sentence	X			
81.	7.116	Emergency preparedness is a title		X			

Note: Blue parts are those to be added in the text. ~~Red parts~~ are those to be deleted in the text.

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)** (with comments of GRS) Page 1 of 33 Country/Organization: **Germany** Date: 2015-01-05				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	In this Safety Guide, the term 'source term' seems to be used in a different context as defined in the IAEA Safety Glossary (2007 Edition). In the latter one, 'source term' is defined as "*The amount and isotopic composition of material released (or postulated to be released) from a facility.*" At several paragraphs in the draft document, the term seems to be used as a synonym for the inventory of radionuclides. However, the source term is only a subset of the total inventory which could be released from a facility.			The intended meaning is "radiation source strength".		
2	General	In this Safety Guide, the term 'basic safety function' is used. In a few recently published IAEA Safety Standards, however, the term 'main safety functions' is introduced, e.g. in the Safety Guide SSG-30 "Safety Classification of Structures, Systems and Components in Nuclear Power Plants" (2014). Therefore, it is proposed to replace 'basic safety functions' by 'main safety functions' to be consistent in terminology within new IAEA Safety Standards. The superordinate Safety Requirements NS-R-5 (Rev. 1) only refers to 'safety functions'.		X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3	1.8	1st sentence: "This Safety Guide is limited to the safety of reprocessing facilities ~~facility's~~ themselves, the protection of their workers and the public, and the protection of the environment around them." 2nd sentence: "… the ancillary process facilities in which wastes and effluents are treated, conditioned, ~~treated,~~ stored, or disposed of, except in so far as all wastes produced should comply with the requirements of (Refs. [1]: paras. 6.31–6.32, 9.54–9.57, Appendix IV: paras. IV.49–IV.50, IV.80–IV.82 and [8])."	Editorial / Wording. 1. To place the different steps for radioactive waste management in the correct order (treatment precedes conditioning). 2. Uniform citation of paragraph numbers throughout the document.	X X	"…the ancillary process facilities in which wastes and effluents are pretreated, treated, conditioned, stored, or disposed of, except in so far as all wastes produced should comply with the requirements of (Refs. [1]: paras. 6.31–6.32, 9.54–9.57, Appendix IV: paras. IV.49–IV.50, IV.80–IV.82 and [8])."		To comply with wording in Ref. [8]
4	1.11	5th sentence: "Section 4 deals with ~~on~~ safety considerations at the design stage, including safety analysis for operational states and accident conditions, the safety aspects of radioactive waste management in the reprocessing facility, and other design considerations."	Wording / Editorial.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
5	Footnote No. 4 (p. 3)	"… DEC: Postulated ~~A~~accident conditions that are not considered for design basis accidents, but that are considered in the design process of the facility in accordance with best estimate methodology, and for which releases of radioactive material are kept within acceptable limits (Ref. [29]).”	To be in line with the definition of DEC in the Safety Requirements SSR-2/1 (Rev. 1) as endorsed by the CSS in November 2014.			X	The addition of “postulated” is unnecessary and confusing as DBA are not defined as “postulated design basis accidents” but both DBA & DEC come about: Root cause→PIE’s→DBA→DEC (potentially)
6	2.6	3rd sentence: “The third level should be provided by the iteration and development of the safety assessment and the design to incorporate appropriate passive and active SSC’s with the necessary robust auxiliary systems, infrastructure (services, maintenance etc.) and appropriate operation instructions and training (Sections 4 and 7).”	Especially active SSCs provided on the third level of defence in depth (usually called safety systems) rely on auxiliary systems (e.g. electric power, pressurized air, cooling water, lubrication, I&C equipment). The auxiliary systems have to be designed with the same robustness as the SSCs themselves. This is consistent with Para 2.13 which uses the term ‘utility supply services’ instead of ‘auxiliary systems’.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
7	2.6	Last sentence: "The recommendations for accident conditions (Level 4 and 5) are addressed in the sections on Emergency preparedness (paras. ~~4.152–157~~ 4.151–4.156 and 7.116–7.121)."	Wrong paragraphs are cited.	X			
8	2.8	1st sentence: "Due to the anticipated long lifetime of industrial scale reprocessing facilities and taking into account the specific mechanical, thermal, chemical, and radiation conditions of the processes, the potential for ageing and degradation of structures, systems and components (SSCs) important to safety requires particular attention, especially for those components judged difficult or impracticable to inspect, to monitor or to replace."	With respect to potential ageing and degradation effects, special attention should be paid not only to those SSCs judged difficult or impracticable to replace, but also to items which are difficult to inspect and/or to monitor for such effects.			X	This aspect is addressed by the final sentence of the para. In general any plant item which cannot be satisfactorily inspected or monitored is unsuitable for designation as a SSC important to safety.

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
9	2.9	1st sentence: "Reliability of process equipment should be ensured by adequate design, specification, manufacturing, storage (if necessary), installation, commissioning, operation, maintenance and facility management supported by the application of ~~a rigorous~~ an integrated management system ~~(quality assurance and quality control)~~ during all the phases of the ~~facilities~~ facility's lifetime."	It is proposed to use the term 'integrated management system' as introduced in the Safety Requirements GS-R-3 and in DS456 "Leadership and Management for Safety" (revision of GS-R-3), to be consistent with superordinate IAEA Safety Requirements.		"… of an integrated management system (which provides for quality assurance and quality control) during all the phases of the facility's lifetime. Inspection and testing should be in accordance with unambiguous, established performance standards and expectations."		To combine the comments France #7, Germany #9 and Japan #6 and retain the reference to QA and QC which may not be immediately obvious components of an IMS to some readers.
10	2.11	"All reprocessing facilities should have alarm systems to initiate full or partial facility evacuation in the case of emergencies (criticality, fire, high radiation, etc.)."	Editorial (missing word).	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
11	2.12	Last sentence: "The ~~ability of~~ operators should be assisted to clearly interpret and respond decisively to developing situations in the facility in a safety oriented manner ~~is crucial to safety~~."	Para 2.12 deals with the human factor engineering aspects, in particular in control rooms and for I&C systems. The last sentence does address more the skills of the operators. The objective is, by applying human factors engineering, to create a working environment assisting the staff in unambiguous decision making.		"The ease with which operators can clearly interpret and ……"		The chosen wording is less ambiguous than "ability" and delivers the intent of the comment more clearly.
12	3.2	"~~For~~ In the siting of new reprocessing facilities, particular attention should be given to: …"	Editorial.	X			
13	3.2	2nd bullet: "The suitability of the site to accommodate the engineering and infrastructure requirements of the facility, including: – Waste ~~treatment~~ processing and storage (for all phases of the facility's life); …"	According to the IAEA Safety Glossary (2007 Edition), the term 'processing' is more comprehensive and includes 'pretreatment', 'treatment' and 'conditioning'.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
14	3.2	4th bullet: "~~Flooding:~~ Natural and human-induced hazards: – The site specific loads due to hazards should be determined to define the design basis of SSCs. Some aspects of reprocessing facilities are particularly affected by potential flooding (criticality, water penetration through openings in static barriers, damage to vulnerable items e.g. glove boxes);"	There are more hazards than flooding. The site specific hazard curve is important to design SSCs in such a way that they can withstand the loads at least up to the design basis event. Therefore it is proposed to rephrase the 4th bullet.			X	The general requirement is covered by Ref. [10]. See France #11 also.
15	3.2	5th bullet: "Physical security measures in accordance with the guidance provided in the IAEA ~~n~~Nuclear ~~s~~Security ~~guidance s~~Series publications (Ref. [26])."	Wording / Editorial.	X			
16	3.3	1st sentence: "The site characteristics should be appropriately monitored and systematically evaluated during the reprocessing facility's ~~facilities~~ life-cycle."	Editorial.		Superseded by rewording of 3.3 see ENISS #2		
17	Footnote No. 9 (p. 9)	"The requirements relating to design for a reprocessing facility are established in (Ref. [1]: Section 6 and Appendix IV: paras. IV.2–IV.50~~52~~)."	Wrong paragraph of Appendix IV is cited in the footnote.	X			
18	Headline before 4.1	"**~~Basic~~ Main safety functions for reprocessing facilities**"	See our general comment No. 2.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
19	4.1	"The ~~basic~~ main safety functions (Ref. [1]: Appendix IV: para. IV.2) i.e. those functions, the loss of which, may lead to exposure to or releases of radioactive material having possible radiological consequences for workers, the public or the environment, are those designed for: 1) ~~Confinement of radioactive materials (including removal of decay heat and dilution of radiolysis gases)~~ Prevention of criticality; 2) ~~Protection against external exposure~~ Cooling of radioactive material (including removal of decay heat); 3) ~~Prevention of criticality~~ Confinement of radioactive material (including protection against external exposure and dilution of radiolysis gases). The ~~basic~~ main safety functions are further developed in (paras. ~~4.13~~4.14–4.57)."	In a few recently published IAEA Safety Standards (e.g. in the Safety Guide SSG-30), the term 'main safety functions' is used. For the sake of consistency, it is proposed to replace 'basic safety functions' by 'main safety functions'. It is recommended to change the order of the main safety functions to be consistent with the usual order in other IAEA Safety Standards (for NPPs) and in the IAEA Safety Glossary (2007 Edition), i.e. 1. Control of reactivity; 2. Cooling of radioactive material; 3. Confinement of radioactive material. In general, heat removal is also a main safety function and not only a safety function related to the confinement of radioactive material. Our proposal aims for improving consistency with the definition of the term 'main safety functions' in the IAEA Safety Glossary. Wrong paragraph is cited in the last sentence.		For: 1) Prevention of criticality; 2) Confinement of radioactive materials (including removal of decay heat and dilution of radiolysis gases); 3) Protection against external exposure.		See France #13 also: Concern about the loss of decay heat removal may have a number of immediate results (e.g. increased corrosion) but the ultimate concern is almost exclusively loss of containment and the escape of radioactive materials. In some specific cases other concerns may apply (e.g. dimensional changes relevant to criticality prevention or the melting or deformation of neutron decoupling provisions). There is no particular importance to the order of the safety functions but for continuity the order is changed to that in the other Ref. [1] related safety guides.

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
20	4.5	3rd bullet: "The requirements on ~~the dilution~~ preventing explosions of radiolytic hydrogen as established in (Ref. [1]: para~~s~~. 6.53 and Appendix IV: IV.33). In view of the widespread potential for the generation of radiolytic hydrogen, the need to mitigate hydrogen releases ~~for adequate air flows (or alternative techniques)~~ should be given appropriate consideration in design (e.g. dilution, inertization, ignition or recombination). Particular care should be paid to ~~the need to ensure the provision of adequate diluting air flow, without the need for ventilation fans or compressors if possible,~~ avoid the presence of ignition sources in areas of potential hydrogen releases, particularly in accident states."	Neither in Para 6.53 nor in Appendix IV.33 of NS-R-5 the dilution of hydrogen is required, but the control of hydrogen releases. There are more technical solutions available to control hydrogen, for example (in NPPs) • passive autocatalytic recombiners; • igniters; • inertization. Technical guidance can be found in IAEA-TECDOC-1661 "Mitigation of Hydrogen Hazards in Severe Accidents in Nuclear Power Plants" (2011). The presence of ignition sources should be avoided to prevent deflagration or detonation of hydrogen.		"The requirements on the need to address the generation of radiolytic hydrogen and other flammable or explosive gasses and materials are established in (Ref. [1]: paras. 6.53, 6.54 and Appendix IV: IV.33). In view of the widespread potential for the generation of radiolytic hydrogen, the need for adequate diluting air flows (or alternative techniques, as appropriate) should be given appropriate consideration in design. Particular care should be paid to the need to ensure the provision of adequate diluting air flow (where applicable) without the need for ventilation fans or compressors if possible, in accident states.		The aim here is to bring the matter to the designers and outline the main method used for control in current designs of reprocessing facilities

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
21	4.5	5th bullet: "The requirements on prevention of criticality as established in (Ref~~s~~. [1]: paras. 6.43–6.51, Appendix IV: IV.9 –IV.20 ~~and [23]~~). *All processes with fissile materials ~~are~~ should be designed in such a way ~~as to prevent~~ that criticality accidents become extremely unlikely to occur with a high level of confidence."*	1st sentence: Strictly speaking, IAEA Safety Guides like SSG-27 do not establish requirements. Thus, Ref. [23] needs to be deleted here. 2nd sentence: In a Safety Guide, usually recommendations (or "should" statements) are provided. As an uncontrolled nuclear chain reaction imposes a significant threat to workers and the public, criticality should be practically eliminated in reprocessing facilities. The concept of practical elimination has already been introduced in the IAEA Safety Standards SSR-2/1 and NS-G-1.10 relevant for NPPs. The term 'practically eliminated' is defined as follows: "*The possibility of certain conditions occurring is considered to have been practically eliminated if it is physically impossible for the conditions to occur or if the conditions can be considered with a high level of confidence to be extremely unlikely to arise.*"		"The requirements and general guidance on the prevention of criticality are established and given in (Refs. [1]: paras. 6.43–6.51, Appendix IV: IV.9 –IV.20 and [23]). All processes with fissile materials should be designed in such a way as to avoid an accidental criticality."		"*practically eliminated*" is currently applied to design extension conditions and no consensus has been reached over its use in DBA. The Fundamental safety principles SF-1 uses the verb "prevent"| in Principle 8: Prevention of accidents: "…to ensure that the likelihood of an accident having harmful consequences is extremely low, measures have to be taken: —To prevent the occurrence of failures or abnormal conditions (including breaches of security) that could lead to such a loss of control; —To prevent the escalation of any such failures or abnormal conditions that do occur; —To prevent the loss of, or the loss of control over, a radioactive source or other source of radiation. It is more realistic to use the verb "avoid" rather than the more absolute "prevent"

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22	4.6	"Ref. [13] and its supporting ~~G~~guide~~s~~ [7] ~~give~~ establish the general requirements and present recommendations for preparation for decommissioning."	Strictly speaking, IAEA Safety Guides do not establish requirements. Hence, wording needs to be adjusted (compare with the wording in Para 3.1). Please include Ref. [7] to the Safety Guide WS-G-2.4 which provides further guidance.	X			
23	Headline before 4.7	"**Other engineering design guidance**"	The headline should be printed in bold, as is the case for the other headlines in the subsection "GENERAL".	X	All sub-heading are in the same format		
24	4.10	1st sentence: "The definition of a design basis accident (DBA) and design basis external (DBE) event, in the context of nuclear fuel cycle facilities, can be found in (Ref. [1]: Annex III: para. III-10)."	Wording.	X			

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25	4.11	"The specification of a DBA or DBE (or equivalent) will depend on the facility design, the site, and national criteria. However, particular consideration should be given to the following events and hazards in the specification of design basis accidents for reprocessing facilities: • Postulated initiating events ○ Loss of cooling (for decay heat removal etc.); ○ Loss of electrical power; ○ Nuclear criticality accident; • Postulated initiating events induced by natural and human-induced hazards ○ Internal and external ~~E~~explosions; ○ ~~Nuclear criticality accident;~~ ○ Internal and external ~~F~~fires; ○ Natural phenomena (earthquake, flooding, or tornadoes, etc.); ○ ~~Loss of electrical power;~~ ○ Aircraft crash. The events listed in above may occur as a consequence of a postulated initiating event (PIE), selected PIEs are listed in (Ref. [1]: Annex I)."	A hazard itself is neither a PIE nor a DBA, but can cause a PIE and maybe escalate to a DBA. DBEs are site specific and do not only depend on the facility design or national criteria.	X			
26	4.15	1st sentence: "In reprocessing facilities (in ~~for~~ most areas), according to a graded approach, three (or more as required by the safety analysis) barriers should be provided."	Editorial.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
27	4.15	"… The design of the static containment system should take into account openings between different confinement zones (e.g. doors, instrument or pipe penetrations). These openings should be designed with care to ensure that confinement is maintained during operation~~, especially~~ and in accident conditions. Careful attention should be given during maintenance, ~~(~~e.g. provision of permanent barriers or for installing temporary, additional barriers (Ref. [1]: Appendix IV: paras. IV.22 and IV.28). These are supplemented by dynamic containment system(s) as necessary."	The isolation of contaminated atmospheres is especially important in accident conditions, where releases are possible.		These openings should be designed to ensure that confinement is maintained during operation, especially maintenance (e.g. provision of permanent or temporary, additional barriers (Ref. [1]: Appendix IV: paras. IV.22 and IV.28) and, as far as practicable, in accident conditions.		Simpler wording
28	4.19	"The building ventilation systems, including ~~duplication~~ redundant subsystems, filtration and other discharge control equipment, should be designed and assessed according to the type and design of static barriers (cells, gloveboxes, building), the classification of areas according to the hazards, the nature of potential airborne contamination and the requirements for maintenance (Ref. [1]: Appendix IV: para. IV.23)."	In nuclear safety, the term 'redundancy' is commonly used instead of 'duplication'.	X			
29	4.29	1st sentence: "~~Where~~ For the processing of easily ~~dispersed~~ dispersible radioactive materials, where the main hazard is contamination or ingestion, ~~are processed~~ gloveboxes are often the design solution."	Clarification.	X			
30	4.30	"For normal operation, the need for personal protective respiratory equipment should be minimized through careful design of static and dynamic containment systems and of devices for the immediate detection of low levels of airborne radioactive material ~~(~~and their location, para. 4.25 ~~24~~ …"	Wrong paragraph is cited. Monitoring of airborne radioactive material is dealt with in Para 4.25.	X			

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31	4.34	"Detailed recommendations for the treatment and monitoring of radioactive wastes and effluents are outside the scope of this guide but similar considerations (paras. 4.3130–4.3231) apply to liquid discharge points and sampling in the environment."	Wrong paragraphs are cited.	X			
32	4.35	1st sentence: "Radioactive decay heat, exothermic chemical reactions (e.g. neutralization of acid or alkaline ~~basic~~ solutions), and physical heating and cooling/condensation processes may result in: …"	Wording.	X			
33	4.40	"The aim of protection against radiation exposure is to maintain the doses below the ~~target~~ limits mentioned in ~~para. 4.5 (above)~~ (Ref. [5]: Schedule III: paras. III.1 and III.2) by using the following elements, separately or in combination: …"	Beside the objective to avoid internal dose during normal operation, no specific dose targets are mentioned in Para 4.5 of DS360. It is proposed to refer to the dose limits for occupational exposure as given in Schedule III of GSR Part 3.	X			See France #31 also

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34	4.42	1st and 2nd sentence: "In a high beta-gamma activity facility (HA units), the design of shielding should consider both ~~source term~~ inventory of radionuclides and location. In a medium or low activity facility, a combination of ~~source term~~ inventory of radionuclides and location, time and shielding should be utilized for protection of workers for both whole body and extremity doses."	According to the IAEA Safety Glossary, the 'source term' is the amount and isotopic composition of material released from a facility. For a proper shielding design, the whole amount of radioactivity in the facility (i.e. the inventory of radionuclides) has to be considered.		"….radiation source strength…" "….radiation source strength…"		See Germany #1 also
35	4.47	1st sentence: "… general recommendations on criticality prevention are presented in (Ref. ~~[19]~~ [23])."	Wrong reference is cited in this paragraph. Guidance on criticality prevention is provided in SSG-27 "Criticality Safety in the Handling of Fissile Material".	X			
36	4.50	"When required by the safety analysis, the ~~prevention of the~~ precipitation of fissile material within solutions should be prevented by e.g.: …"	Wording.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
37	Headline before 4.53	"***Criticality Safety Assessment***"	To be in line with the terminology used in the subsequent Para 4.53, in the Safety Guide SSG-27, and in Appendix IV, Paras IV.9 – IV.20 of the Safety Requirements NS-R-5 (Rev. 1).	X			
38	4.53	"The aim of the criticality safety assessment, as required in (Ref~~s~~. [1]: Appendix IV: para. IV.11 ~~and [23]~~), is to demonstrate that the design of equipment and the operating conditions in the reprocessing facility are such that the values of controlled parameters are always maintained in the sub-critical range. Guidance on criticality safety assessment is provided in (Ref. [23])."	Strictly speaking, IAEA Safety Guides like SSG-27 do not establish requirements. Hence, wording needs to be adjusted here.	X			

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39	4.54	"The criticality safety assessment should include a criticality safety analysis, which should evaluate subcriticality for all operational states (i.e. normal operation and anticipated operational occurrences) and also during and after DBA conditions. The criticality safety analysis should be used to identify hazards, both external and internal, and to determine the radiological consequences. The criticality safety analysis should ~~for normal, abnormal, and DBA facility states,~~ involve: …"	Ensure consistency with Para 4.6 of the Safety Guide SSG-27. The relationship between criticality safety assessment and criticality safety analysis should be clarified. The facility states are defined in Annex III, Para III-12 of NS-R-5 (Rev. 1). According to the scheme provided therein, the term 'operational states' is more comprehensive and covers 'normal operation' (i.e. normal conditions) and 'anticipated operational occurrences' (i.e. abnormal conditions).	X			

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40	4.54	1st bullet: "The use of a conservative approach with account taken of: – Uncertainties in physical parameters, ~~the possibility of worst case~~ optimum moderation conditions and the presence of non-homogeneous distributions of moderators; – Combinations of anticipated ~~Plausible~~ operational occurrences ~~and their combinations~~ if they cannot be shown to be independent; – Facility ~~Operational~~ states that may result from external and internal hazards."	1st item: The commonly used term is 'optimum moderation conditions'. 2nd item: Maintain consistency with our proposal for modification of Para 4.54 and avoid repetitions (see also our preceding comment). 3rd item: Ensure consistency with our proposal for modification of Para 4.54. From a regulatory point of view, the current recommendation is too narrow. In addition to operational states, the criticality safety analysis should also take into account DBA conditions that may result from external and internal hazards.	X X	Anticipated operational occurrences and their combinations if they cannot be shown to be independent		To include consideration of all AOO

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
41	4.54	2nd bullet: "The use of appropriate and qualified computer codes that are validated and verified (i.e. ~~those that have been~~ compared with benchmarks ~~(validated and verified)~~ to determine the effects of code bias and code uncertainties ~~in the code in respect of~~ on the calculated, effective multiplication factor, k_{eff}) ~~used~~ within their applicable range and with appropriate data libraries of nuclear reaction cross-sections. Detailed guidance is provided in (Ref. [23]: paras. 4.20–4.25)."	Clarification. Instead of the benchmarks, the computer codes used in the criticality safety analysis should be validated and verified. Verification is the process of determining whether a calculation method correctly implements the intended mathematical model. Validation is the process of determining whether the overall calculation method adequately reflects the real system being modelled, and enables the quantification of any code bias and uncertainty, by comparing the predictions of the model with observations of the real system or with experi-mental data. As the Safety Guide SSG-27 provides further guidance on the verification and validation of computer codes, a reference to this publication should be added here.	X			

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42	4.55	"An alternative method of analysis is to specify, for physical parameters such as mass, volume, concentration, geometrical dimensions, a 'safe value' as a fraction of their critical value, and demonstrating that these parameters will always be less than their safe value for ~~under~~ all operational states ~~normal, abnormal conditions~~ and for DBA conditions."	Wording adjusted to be in line with the introductory sentence in Para 4.54 (see our corresponding comment).	X			
43	4.57	"The potential for fitting additional shielding, remote operation and other design measures to mitigate the consequences ~~lessen the hazard~~ of a criticality accident, if ~~should~~ one does occur, should be assessed in accordance with the Defense in Depth requirements (Ref. [1]: paras. 2.4–2.8 and Appendix IV: para. IV.29)."	Improve wording to be in line with Appendix IV, Para IV.29 of the Safety Requirements NS-R-5 (Rev. 1).	X			
44	Footnote No. 26 (p. 22)	"The requirements relating to fire for a reprocessing facility are established in (Ref. [1]: Section 2,~~) (Ref. [1]: Section 6~~ para. 6.55 and Appendix IV: paras. IV.33–IV.36)"	Editorial. Compare also with Para 4.62.	X			
45	Footnote No. 28 (p. 25)	"The requirements relating to explosion for a reprocessing facility are established in (Ref. [1]: Section 2,~~) (Ref. [1]: Section 6~~ para. 6.54 and Appendix IV: paras. IV.33–IV.36)"	Editorial. Compare also with Para 4.67.	X			
46	Footnote No. 29 (p. 26)	"The requirements relating to handling events for a reprocessing facility are established in (Ref. [1]: Section 2~~) (Ref. [1]:~~ and Appendix IV: para. IV.42)"	Editorial.	X			
47	Footnote No. 31 (p. 27)	"The requirements relating to equipment failure for a reprocessing facility are established in (Ref. [1]: Section 2~~) (Ref. [1]: para. 4.2~~ and Appendix IV: para. IV.37)"	Editorial. Wrong paragraph is cited in the footnote.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
48	Footnote No. 32 (p. 27)	"The requirements relating to the loss of support systems for a reprocessing facility are established in (Ref. [1]: Section 2,~~) (Ref. [1]:~~ para 6.28 and Appendix IV: para. IV.40–IV.41)"	Editorial.	X			
49	4.73	2nd sentence: "… should be provided to relevant Structures, Systems and Components important to safety, including the following (Ref. [1]: Appendix IV: para. IV.~~:~~41): …"	Editorial.	X			
50	Footnote No. 33 (p. 29)	"The requirements relating to corrosion, erosion and mechanical wear for a reprocessing facility are established in (Ref. [1]: Section 2,~~) (Ref. [1]:~~ para 6.17~~,~~ and Appendix IV:~~:~~ paras. IV.18 and IV.38)"	Editorial.	X			
51	Footnote No. 34 (p. 29)	"The requirements relating to internal flooding for a reprocessing facility are established in (Ref. [1]: Section 2~~)~~ ~~(Ref. [1]:~~ and Appendix IV: para. IV.39)"	Editorial.	X			
52	after 4.90	Wrong numbering of a single paragraph in the subsection "*Earthquake*": Replace "4.89" by "4.91". Renumbering of subsequent paragraphs in Section 4 is required.	Editorial correction.	X			
53	Headline before 4.92	"***External fires and explosions***"	The headline of this subsection is inadvertently placed at the beginning of Para 4.92.	X			
54	4.92	"The reprocessing facility design should address external fire and explosion hazards as ~~quantified~~ identified in the ~~siting~~ site evaluation (Section 3)."	Wording / Grammar.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
55	4.94	Delete this paragraph.	Identical text is presented in Para 4.93. Avoid unnecessary duplication.	X			
56	4.95	1st sentence: "A reprocessing facility should be protected against extreme weather conditions as identified in the ~~siting~~ site evaluation (Section 3) by means of appropriate design provisions."	Grammar.	X			
57	4.101	3rd sentence: "… and all glovebox penetrations should be above any potential flood levels (Ref. [1]: Appendix IV: para. IV.46)."	Editorial.	X			
58	4.103	"In accordance with the risk identified during the ~~siting~~ site evaluation (Section 3), reprocessing facilities should be designed to withstand the design basis impact …"	Editorial / Grammar.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
59	4.106	1st sentence: "Instrumentation should be provided to monitor the variables and systems of the facility over their respective ranges for: (1) Normal operation; (2) Anticipated operational occurrences; (3) Design basis accidents and, as far as practicable; (4) ~~Beyond design basis accidents (d~~Design extension conditions~~).~~."	To be consistent with recently published IAEA Safety Standards (e.g. SSR-2/1), the term 'beyond design basis accidents' should be avoided and 'design extension conditions' should be used instead. The upcoming revision of NS-R-5 Rev. 1 (DS478) will introduce this concept for nuclear fuel cycle facilities.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
60	4.108	"According to the requirements of the safety analysis and any defense in depth consideration, I&C systems should incorporate redundancy and diversity to ensure an appropriate level of reliability and availability. This should include the requirements for a reliable and uninterrupted power supply to the instruments."	It is agreed that a reliable power supply is important. Beyond that, an uninterrupted power supply – bridging the time between loss of external grid and start-up of emergency power supplies – is considered to be important especially for I&C systems.	X			
61	4.115	Last sentence: "… the appropriate course of action to return the facility to a safe and stable state (Ref. [1]: Appendix IV: para. IV.47). ~~[1]).~~"	Editorial.	X			
62	Footnote No. 38 (p. 40)	"The requirements relating to the consideration of human factors are established in (Ref. [1]: paras. 6.15 and 6.16)."	Wrong paragraph is cited in the footnote (compare also with Para 4.9).	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
63	4.120	Last sentence: "Particular attention should be paid to situations where operator action is anticipated in ~~DBA and~~ accident conditions for emergency and mitigation activities for rapid, fault-free and fault tolerant, problem identification."	According to Footnote No. 4 of the document, accident conditions include design basis accidents (DBAs) and design extension conditions (DECs).	X			
64	4.123	3rd bullet: "Consideration of the requirement for glovebox and glovebox window seal etc. maintenance including the need for personal protective equipment ~~PPE~~ during these operations."	The abbreviation 'PPE' has not been introduced elsewhere in the document. Therefore, its usage should be avoided here.	X			
65	4.128	Item 1): "Calculations with a bounding ~~source term~~ activity level on the basis of: – Inventory including activity, energy spectrum, and neutron emission of all radioactive materials, and; – Accumulation factor (e.g., accounting for deposition of radioactive material inside pipes and equipment);"	According to the IAEA Safety Glossary, the 'source term' describes the amount and isotopic composition of material released from a facility.		… bounding radiation source strength on the basis….		Radiation source strength is the required parameter

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
66	4.128	Item 2): "Two approaches are possible to assess external doses (Ref. [1]: paras. 2.6, 2.10–2.12 and 4.24): i. Define a limit for dose that will allow any worker to be present without time constraints, and the distance between the source ~~term~~ of radiation and the worker, or; ii. Identify and take into account the type of and time required for the work activity to be performed by each worker and the distance between the worker and the source ~~term~~ of radiation;"	Clarification. There might be a certain distance between the worker and the source of radiation rather than between the worker and the source term.	X			
67	4.128	Item 3): "Calculations to ~~determine~~ verify an adequate design of the shielding ~~requirements~~ to meet radiological dose limits for workers."	The objective of a safety analysis is not to define the shielding requirements, but to demonstrate that the designed shielding is sufficient to meet predefined radiological criteria (e.g. dose limits, dose rates).			X	This is the initial stage of design. The final objectives are given in 4.134

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
68	4.129	1st sentence: "The calculation of estimated dose for the public should include all the radiological contributions originating in the facility, i.e. direct or indirect (e.g. sky ~~effect~~ shine, cloud shine or ground shine ~~deposition~~) radiation, intake of radioactive material, and doses received through the food chain as a result of authorized discharges of radioactive material."	It is proposed to replace the following terms to be consistent with the definitions provided in the IAEA Safety Glossary (2007 Edition): • 'sky effect' by 'cloud shine' to consider external exposure by airborne radionuclides; • 'ground deposition' by 'ground shine' to consider external exposure due to radionuclides deposited on the ground. Furthermore, we propose to add the term 'sky shine' to account for direct radiation from the facility, reflected by the atmosphere and thereby leading to a higher external exposure in a large distance from the facility.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
69	4.129	"… Conservative models and parameters should be used to estimate doses to the public. The doses should also be estimated for the representative person~~(s)~~."	No plural (there is only one representative person). GSR Part 3 defines the representative person as "*an individual receiving a dose that is representative of the doses to the more highly exposed individuals in the population*". According to the ICRP Publication 101, the dose to the representative person is the equivalent of, and replaces, the mean dose in the critical group. All members of the public are considered to be adequately protected if the estimated effective dose to the representative person complies with the dose limit.			X	Different 'representative person' for different events/releases etc. hence person(s)
70	4.131	"The acceptance criteria associated with the accident analysis should be defined in accordance with (Ref~~s~~. [20]: Req. 16) and …"	Editorial.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
71	4.134	Bullet b.: "Identification of workers and members of the public who could possibly be affected by accidents~~;~~ (i.e. the representative person~~(s) people~~ living in the vicinity of the facility);" Bullet i.: "Quantification of the consequences for the representative person~~(s)~~ identified in the safety assessment."	See our related comment on Para 4.129. See our related comment on Para 4.129.			X	Accidents → 'representative person(s)
72	4.137	"The identification of workers and members of the public (the representative person~~(s)~~) who may potentially be affected by an accident should involve …"	See our related comment on Para 4.129.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
73	4.139	"~~"Waste conditioning" and 'a~~Associated waste treatment and conditioning ~~waste~~ facilities~~"~~ are excluded from the scope of this guide (paragraph 1.8, Ref. [1]: Appendix IV). ~~h~~However, the requirements and recommendations on design of such facilities from the relevant IAEA standards (Refs. ~~[7]~~ [8], [27] and [28] ~~[13]~~) apply fully to the wastes (solid, liquid, and~~,~~ gaseous) and effluents resulting from the operation of reprocessing facilities and from their eventual decommissioning."	1st sentence: To place the different steps for radioactive waste management in the correct order (treatment precedes conditioning). 2nd sentence: The references to Safety Standards for decommissioning (GSR Part 5, WS-G-2.4) are obviously misleading here. This paragraph addresses waste treatment and conditioning facilities which are associated with reprocessing facilities, e.g. for vitrification of high level radioactive waste or for immobilizeation of radioactive sludges. For the design of such predisposal waste management facilities, requirements and guidance are provided in GSR Part 5, WS-G-2.5 and WS-G-2.6.	X X		X	"of such facilities" Redundant and possibly confusing

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
74	4.144	1st sentence: "… in accordance with (Ref~~s~~. [8]: para. 1.6, 1.8 and Req. 4 and 6)."	Editorial.	X			
75	4.150	"The design and location of effluent discharge systems for a reprocessing facility should be optimized to maximize the dispersal/ dilution of discharged effluents (Ref. [8] ~~GSR Part 5]~~: para 4.3) and …"	Editorial.	X			
76	4.151	1st sentence: "A comprehensive hazard assessment in accordance with (Ref. [9]: {[DS457]: Req. 4}) should be performed in relation to reprocessing facilities."	The requirement to perform a hazard assessment has been established in DS457 (revision of GS-R-2; future GSR Part 7), but not in GS-R-2 (compare with Para 2.1).		(..Ref. [9]: para 3.7 {hazard assessment …[DS457]: requirement 4)…		DS457 not yet published
77	4.155	2nd sentence: "As far as practicable, the control room(s) should be designed and located so as to remain habitable during postulated emergencies (e.g. separate ventilation, low ~~criticality event~~ calculated dose in the case of a criticality event etc.)."	Clarification.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
78	5.4	Please include a new sentence: "… Testing and verification of specific SSCs important to safety should be performed before construction and installation when appropriate (e.g., verification of shielding efficiency, neutron decoupling devices, geometry for criticality purposes, welding) since this may not be possible or be limited after installation. The operating organization should have effective processes in place to prevent the installation of counterfeit, fraudulent or suspect items, as well as non-conforming or sub-standard components, because such items or components could impair safety even years after commissioning of the reprocessing facility. The recommendations relevant to the care of installed equipment should also be strictly followed."	The emergent issue of counterfeit, fraudulent and suspect items, as well as the increase in non-conforming and sub-standard components, necessitates the improved sharing of operating experience between designers, manufacturers, suppliers, and facility operators. The operating organization should implement effective means to prevent the installation of such equipment because it can be considered as a latent risk to nuclear and radiation safety.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
79	6.10	Please include a new sentence: "Each stage of commissioning may require regulatory approval in accordance with national regulations, prior to starting and at completion. The regulatory body should define hold points and witness points commensurate with the complexity and hazard potential of the facility to ensure proper inspection during commissioning, in order to verify compliance with regulatory requirements and license conditions. The operating organization should establish and maintain effective communications with the regulatory authority, so as to ensure full understanding of the requirements and to maintain compliance with those requirements."	The regulatory body should be involved in the commissioning programme, as recommended in the Safety Guide GS-G-1.3 "Regulatory Inspection of Nuclear Facilities and Enforcement by the Regulatory Body".	X			
80	6.16	Last sentence: "The requirements for this stage are set out in (Ref. [1]: Appendix IV: paras. IV.55–IV.57~~)~~)."	Editorial (surplus bracket).	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
81	7.4	"Round the clock continuity of organization should be provided in order to ensure that the appropriate authority is present on the site, with appropriate access to suitably qualified and experienced personnel (whether on-site or available to be called in, commensurate with the grace time for manual intervention). This should include operations, engineering, radiation protection, emergency management and others as necessary."	• In case of a 24 hours / 7 days operation, the necessary personnel should be available on site. If the personnel will be called in case of demand, the timeframe between alerting the personnel and taking over their responsibilities on site should be commensurate with the facility's grace time for manual intervention.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
82	7.7	"The safety requirements related to the qualification and training of facility personnel are defined in (Ref. [1]: paras. 9.8–9.13). Guidance can also be found in (Ref. ~~[1]~~ [33]: paras. 4.6–4.25)." Add the Safety Guide GS-G-3.1 to the list of references: "[33] INTERNATIONAL ATOMIC ENERGY AGENCY, Application of the Management System for Facilities and Activities, Safety Standards Series No. GS-G-3.1, IAEA, Vienna (2006)"	Wrong reference is cited in the second sentence. Guidance on the qualification and training of reprocessing facility personnel is provided in the Safety Guide GS-G-3.1. Compare with the equivalent paragraphs in the relevant IAEA Safety Guides for other types of nuclear fuel cycle facilities: • Para 7.3 in SSG-5; • Para 7.4 in SSG-6; Para 7.4 in SSG-7.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
83	7.8	Please add a new sentence: "The safety risks and hazards for operators, maintenance staff and other personnel such as the decontamination team should be carefully considered when establishing the training programme. In particular, all staff handling fissile material should have a sound understanding of criticality safety and the relevant physical phenomena."	Based on the experiences and lessons learned from past criticality accidents (e.g. at the JCO Nuclear Fuel Conversion Test Facility in Tokaimura in 1999), a sound understanding of the physical phenomena on all staff levels is crucial for preventing such accidents.	X			
84	7.13	"For reprocessing facilities, the requirements on operating instructions established in (Ref. [1]: paras. 9.21–9.27) should be strictly adhered to."	Amendment to be more specific.	X			
85	7.15	2nd sentence: "If a sub-limit or an OLC is exceeded, the appropriate level of management should be informed (Ref. [1]: Appendix IV: para. ~~IV.136~~ IV.63)."	Wrong paragraph is cited.	X			
86	7.27	1st sentence: "Waste minimization should be an important objective for reprocessing facility's management and operators."	Editorial.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
87	7.41	"Modification control forms should be scrutinized by and be subject to approval by qualified and experienced persons to verify that the arguments used to demonstrate safety are suitably robust. This should be considered particularly important if the modification could have an effect on doses to the workers, the public, environment or criticality safety. The depth of the safety arguments and the degree of scrutiny to which they are subjected should be commensurate with the safety significance (potential hazard) of the modification. The modification control forms should be used to identify the need for a license revision/renewal by the regulatory body. The ~~Review of~~ modification control forms should be reviewed by the safety committee or an equivalent committee, with suitable expertise, independent examination and record keeping. Responsibility for the approval and control of modifications should rest with head of the reprocessing facility."	It is proposed to add the aspect that the licensee has to verify that the planned modification is in line with the current license conditions. If this is not the case, a license revision or renewal by the regulatory body is required.	X	Added to previous para.		More appropriate location.
88	7.47	1st sentence: "The requirements for criticality safety in a reprocessing facility are established in (Ref. [1]: paras. 9.49 and 9.50 and Appendix IV: paras. IV.66–IV.76) and general recommendations are made in (Ref. [23])."	Editorial (missing words). A reference to the Safety Guide SSG-27 "Criticality Safety in the Handling of Fissile Material" needs to be included.	X			
89	7.48	Wrong numbering of a single paragraph in the subsection "CRITICALITY SAFETY": Para No. "7.48" is inadvertently used twice. Renumbering of subsequent paragraphs in Section 7 is required.	Editorial correction.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
90	7.77	2nd sentence: "Where necessary, the relationship between fixed detectors and individual doses should be verified by the use of personal air samplers in ~~preferably, limited duration,~~ sampling campaigns of preferably limited duration."	1. Wording.	X			
91	7.98	"The waste collection and further processing (i.e. pretreatment, treatment and conditioning) should be organized according to pre-established criteria and procedures defined to meet the requirements of defined or planned routes for ~~treatment~~ processing, storage and disposal ~~routes~~."	2. According to the IAEA Safety Glossary (2007 Edition), the term 'processing' is more comprehensive and includes 'pretreatment', 'treatment' and 'conditioning'. Completeness with regard to the further steps involved in the management of radioactive waste as storage is usually part of predisposal management.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
92	7.103	"Information about radioactive waste needed for its safe management and eventual disposal now and in the future should be collected, recorded and preserved according to an appropriate management system (Ref. ~~[17]~~ [32])."	Wrong reference is cited in this paragraph. Further guidance on the management system for predisposal management of radioactive waste is provided in the Safety Guide GS-G-3.3, but not in GSG-3. With respect to this proposal, see also the IAEA resolution table of SSC members comments (June 2014) on draft version 1.4, comment No. JP.W07 provided by Japan. This comment was accepted but incorrectly implemented in the latest version of DS360.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
93	7.108	"Periodic estimate of the impact to the public (representative person~~(s)~~) should be made using data on effluent releases and standard models agreed with the national authorities."	See our related comment on Para 4.129.			X	There may be different representative persons for different species/discharge points
94	Headline before 7.116	"EMERGENCY PREPAREDNESS (Operation)"	The headline of this subsection is inadvertently placed at the beginning of Para 7.116. To separate it from the subsection "EMERGENCY PREPARED-NESS (Design)" in Section 4, add the keyword 'Operation' in brackets.	X			
95	7.121	Wrong numbering of a single paragraph: Replace "7.121" by "7.119".	Editorial correction. Paras 7.119 and 7.120 do not exist in the document.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
96	8.1	"Requirements and recommendations for the decommissioning of nuclear fuel cycle facilities are given in (Ref. [13] and [7]). These require, inter alia, that ~~the initial decommissioning strategy, plan and safety assessment are produced~~ • The decommissioning strategy is selected in accordance with the national policy on the management of radioactive waste; • The initial decommissioning plan is prepared, and; • Safety assessment is conducted • early in the design stage so that decommissioning can be included in the optimization of protection by iteration of the design and safety assessment, and that ~~sufficient~~ adequate financial resources are ~~identified~~ available when necessary to carry out decommissioning, including management of the resulting radioactive waste."	2nd sentence, 1st part: Maintain consistency with Requirements 3, 8 and 10 of GSR Part 6. Please include bullets to support structuring of the different tasks to be fulfilled. 2nd sentence, 2nd part: To be in line with Requirement 9 as well as with Paras 6.1 and 3.2 (last bullet) of GSR Part 6. It is essential that adequate financial resources are available when necessary for ensuring safe decommissioning. This includes the management of the resulting radioactive waste.		Bullets modified to improve clarity		

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
97	8.2	"The decommissioning plan and safety assessments are developed and periodically reviewed throughout the reprocessing facility's commissioning and operational phases (Ref. [13], Req. 7 and 8) ~~{[DS450]: Requirements:7 and 8})~~ to take account of new information and emerging technologies to ensure that: ~~the (updated) decommissioning plan is realistic; can be carried out safely; that provisions are made for sufficient resources, and; that the radioactive wastes anticipated are compatible with available (or planned) interim storage capacities and disposal routes.~~ • The (updated) decommissioning plan is realistic and can be carried out safely; • Provisions are made for sufficient resources, and; • The radioactive wastes anticipated are compatible with available (or planned) interim storage capacities and disposal routes."	Please include bullets to support structuring of the various objectives when developing and periodically reviewing the decommissioning plan and safety assessments throughout the commissioning and operational phases, with the aim to improve the readability of the entire sentence.	X			

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Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
98	8.3	"Due to their size, complexity and the diverse waste arising during operation and decommissioning, particular care should be taken that the following aspects are addressed throughout the lifetime of the reprocessing facility: • ~~f~~Facilities should be, sited, designed, constructed, operated (maintained and modified) to facilitate eventual decommissioning, as far as practicable including: ○ Specific design features to facilitate decommissioning; ○ … • Consideration of the implications for decommissioning when modification to and experiments on the facility are proposed; Comprehensive record preparation for all significant activities and events at all stages of the facility's life, archived in a secure and readily retrievable form, indexed in a documented, logical and consistent manner."	Both the second and the third bullet were inadvertently moved to the beginning of Para 8.4. However, they belong to Para 8.3 as they complete the list of aspects to be addressed throughout the lifetime of a reprocessing facility. Compare with Para 8.3 of the previous draft version 1.4 dated 11 April 2014.	X			

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)** (with comments of GRS) Page 1 of 33 Country/Organization: **Germany** Date: 2015-01-05				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
99	8.4	"~~Consideration of the implications for decommissioning when modifications to and experiments on the facility are proposed; Comprehensive record preparation for all significant activities and events at all stages of the facility's life, archived in a secure and readily retrievable form, indexed in a documented, logical and consistent manner. Requirements i~~In the event of decommissioning being significantly delayed after a reprocessing facility has permanently shut down for decommissioning or shut-down suddenly (e.g. as a result of a severe process failure or accident), general requirements are also given in (Ref. [13]) and include the potential need to revise the decommissioning strategy, the decommissioning plan and the safety assessment."	1st sentence: See our related comment on Para 8.3. 2nd sentence: Improve wording.	X			
100	Annex II	Note on the use of the term 'basic safety function': In a few recently published IAEA Safety Standards (e.g. in the Safety Guide SSG-30), the term 'main safety function' is introduced. For the sake of consistency, it is proposed to replace 'basic safety functions' by 'main safety functions'. According to the IAEA Safety Glossary, the main safety functions (for NPPs) are defined as follows: 1. Control of reactivity; 2. Cooling of radioactive material; 3. Confinement of radioactive material. In general, heat removal is also a main safety function and not only a safety function related to the confinement of radioactive material.	Our proposal aims for improving consistency with the definition of the term 'main safety functions' in the IAEA Safety Glossary (2007 Edition).	X		X	See France #14, Germany #19 etc.

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)** (with comments of GRS) Page 1 of 33 Country/Organization: **Germany** Date: 2015-01-05				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
100	Ref. [2]	"INTERNATIONAL ATOMIC ENERGY AGENCY, Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety, IAEA Safety Standards Series No. GSR Part 1, IAEA, Vienna ~~(2000)~~ (2010)."	GSR Part 1 was published in 2010.	X			
101	Ref. [3]	"INTERNATIONAL ATOMIC ENERGY AGENCY, The Management System for Facilities and Activities, Safety Standards Series No. GS-R-3, IAEA, Vienna (2006) {DS456}."	GS-R-3 is currently under revision by DS456. Add revision notice for completeness.	X			
102	Ref. [4]	"INTERNATIONAL ATOMIC ENERGY AGENCY, ~~Application of t~~The Management System for ~~Facilities and Activities~~ Nuclear Installations, Safety Standards Series No. GS-G-3.5, IAEA, Vienna (2009)."	Citation of the correct title of the Safety Guide GS-G-3.5. The recommendations provided in GS-G-3.5 are supplementary to, and should be read in conjunction with, the generic recommendations given in the Safety Guide GS-G-3.1.	X			
103	Ref. [5]	"… Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards ~~— Interim Edition~~, IAEA Safety Standards Series No. GSR Part 3 ~~(Interim)~~, IAEA, Vienna ~~(2011)~~ (2014)."	The final version of GSR Part 3 was published in July 2014. Therefore, an update is required.	X			

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)** (with comments of GRS) Page 1 of 33 Country/Organization: **Germany** Date: 2015-01-05				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
104	Ref. [6]	"INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANISATION, Occupational Radiation Protection, Safety Standards Series No. RS-G-1.1, IAEA, Vienna (1999) {DS453}."	RS-G-1.1 is currently under revision by DS453. Add revision notice for completeness.	X			
105	Ref. [7]	"INTERNATIONAL ATOMIC ENERGY AGENCY, Decommissioning of Nuclear Fuel Cycle Facilities, Safety Standards Series No. WS-G-2.4, IAEA, Vienna (2001) {DS452}."	WS-G-2.4 is currently under revision by DS452. Add revision notice for completeness.	X			
106	Ref. [8]	"INTERNATIONAL ATOMIC ENERGY AGENCY, Predisposal Management of Radioactive Waste, General Safety Requirements, Safety Standards Series No. GSR Part 5, IAEA, Vienna (2009) ~~{DS447}~~"	Wrong assignment. DS447 is the revision of the Safety Guide WS-G-2.6.	X			
107	Ref. [13]	"INTERNATIONAL ATOMIC ENERGY AGENCY, Decommissioning of Facilities ~~Using Radioactive Materials~~, Safety Standards Series No. ~~WS-R-5~~ GSR Part 6, IAEA Vienna (2014) ~~(2006) {*DS450: Decommissioning of Facilities GSR Part 6 (2014)* }~~"	GSR Part 6 was published in July 2014. Therefore, an update is required.	X			
108	Ref. [19]	"… Fundamental Safety Principles, Safety Fundamentals, Safety Standards Series No. SF-1, IAEA Vienna (2006)"	Uniform citation of publications issued in the IAEA Safety Standards Series.	X			

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)** (with comments of GRS) Page 1 of 33 Country/Organization: **Germany** Date: 2015-01-05				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
109	Ref. [25]	"INTERNATIONAL ATOMIC ENERGY AGENCY, A General Framework for Prospective Radiological Environmental Impact Analysis ~~for Facilities and Activities~~ and Protection of the Public, IAEA Safety Standards Series No. SSG-DS427 (revision of NS-G-3.2), IAEA Vienna"	Citation of the correct title of the latest draft version 5 of DS427 dated September 2014.	X			
110	Ref. [27]	"INTERNATIONAL ATOMIC ENERGY AGENCY, Predisposal Management of Low and Intermediate Level Radioactive Waste, IAEA Safety Standards Series No. WS-G-2.5, IAEA Vienna (2003) {DS448}"	WS-G-2.5 is currently under revision by DS448. Add revision notice for completeness.	X			
111	Ref. [28]	• "INTERNATIONAL ATOMIC ENERGY AGENCY, Predisposal Management of High Level Radioactive Waste, IAEA Safety Standards Series No. WS-G-2.6, IAEA Vienna (2003) {DS447}"	WS-G-2.6 is currently under revision by DS447. Add revision notice for completeness.	X			
113		Please check spelling in the whole document: • 'glove box' versus 'glovebox', • 'programme(s)' versus 'program(s)', • 'lifecycle' versus 'life-cycle', • 'subcritical' versus 'sub-critical', 'analyzed' versus 'analyzed'.	Harmonization of spelling and consistent usage of either British English or American English throughout the document is recommended.	X	The IAEA convention of using the "z" form will be adhered to.		

COMMENTS BY REVIEWER Reviewer: Page: of Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1.4/6	reprocessing ~~facility~~ facilities	Editorial.	X			
2	1.9/2	is ~~as~~ established	Editorial.		…supervision established…		"is" not required
3	1.11/5	Section 4 discusses ~~on~~ safety considerations at the design stage	Editorial. (Verb missing. There is no verb.)		As Germany #4		Either option is acceptable Germany #4 was applied first
4	2.3/the bottom	comply with authorized ~~all regulatory discharge~~ limits for discharges (Ref. [5, 8, X, Y]). Add followings to the reference. [X] INTERNATIONAL ATOMIC ENERGY AGENCY, Regulatory Control of Radioactive Discharges to the Environment, IAEA Safety Standards Series No. {DS442} (revision of WS-G-2.3), IAEA, Vienna [Y] INTERNATIONAL ATOMIC ENERGY AGENCY, Predisposal Management of Radioactive Waste from Nuclear Fuel Cycle Facilities, IAEA Safety Standards Series No. {DS447} (revision of WS-G-2.5 and WS-G-2.6), IAEA, Vienna	See GSR Part 3 para.3.123.	X			
5	2.6/7	and training	Editorial Typo.	X			
6	2.9/5	Inspection and testing should ~~be against~~ comply with or in accordance with unambiguous, …	For the better wording.		See Germany #9		

COMMENTS BY REVIEWER Reviewer: Page: of Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
7	2.13/4-6	loss of both normal and one of back-up services will not lead to unacceptable consequences. ~~This should be achieved by a combination of robust design including diverse and redundant supplies.~~ Wherever possible…	Clarification for condition of normal and back-up utility supply services. The 2nd through the 4th sentences may cause confusion because "the simultaneous loss of normal and back-up services" ~~means that even~~ sounds as though "diverse and redundant supplies" are lost. Therefore, the 3rd sentence should be deleted with a small modification in the 2nd sentence.		2nd sentence now: "Continuity of service should be achieved by robust designs including sufficient diverse and redundant supplies." The 3rd sentence remains unchanged.		Maintain the intent that robust designs should be used for "services" but that, as far as practicable, the loss of all services should be accommodate by design.
8	2.13/8 Footnote 7/2	to this position	Editorial. Typo.	X			
9	3.2/5	- Information on local physical data relevant to the dispersion of released radioactivity and its potential effects on people; - The physical factors affecting the dispersion and accumulation of released radioactivity and the radiological risk to people;	Superfluous. Two sentences ~~say~~ are describing almost the same thing. Delete one or the other.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
10	4.1/6	2) Protection against internal and external exposure;	Adding word for clarification and comprehensive description. -Para.4.5 first bullet sentence says "internal dose is avoided by design". -Para.4.30 says "the need for personal protective respiratory equipment should be minimized through careful design of …"			X	See France #13, Germany #19 and Russia #14
11	4.5/5	Radiation protection based on t~~T~~he use of personal protection (personal protection equipment, (Ref.[5])) should be avoided.	Better wording. Using personal protection equipment itself isn't always inappropriate.		The use of personal protection (personal protective equipment, (Ref. [5])) should be minimized in accordance with the optimization of protection.		More appropriate wording aligning use with the "optimization of protection" thus permitting its use when justified.
12	4.9/1	should benefit from ~~of~~ the ergonomic	Editorial.	X			4.9 deleted - see Russia #7
13	4.12/3	radioactive releases to the environment	Editorial.	X			

COMMENTS BY REVIEWER Reviewer: Page: of Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
14	4.15/1-2	In reprocessing facilities (in for most areas), according to a graded approach, ~~three~~ two (or more as required by the safety analysis) static barriers and a dynamic containment system should be provided.	Clarification. This "three barriers" doesn't seem to be consistent with NS-R-5 (Rev. 1) Appendix IV.22, which requires two static barriers. So, it should be consisted with among them taking into account a graded approach.			X	The requirement is "at least two" for any nuclear fuel cycle facilitiy. The recommendation for reprocessing plants is that there should be 3 (or more)
15	4.26/3	so as to ensure	Editorial.	X			

COMMENTS BY REVIEWER Reviewer: Page: of Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
16	4.51/8-9	Level measurement devices~~detectors~~ should also be installed in the drip trays to provide additional defence ~~defense~~ in depth.	Clarification. Normally, drip tray doesn't have level measurement detectors but has leak detectors which detect ~~that the level of leaked liquid goes beyond the fixed level. "Level measurement devices" is better wording.~~ the excess of leaked liquid level against the preset limit.	X	Level measurement or liquid detectors…..		
17	4.54/4	non-homogeneous distributions of fissile materials and moderators	Clarification.	X			
18	4.59/5	of neutron decoupling devices	Clarification.	X			

COMMENTS BY REVIEWER Reviewer: Page: of Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
19	4.65	Delete ~~this sentence~~ the sentence below. Evacuation routes for fire and criticality event should be the same as far as possible.	This is not practical measure. Evacuation routes for criticality event are fixed in advance because there ~~are~~ will be no time to decide ~~judge~~ the appropriate evacuation route in such case. ~~to which way to evacuate~~. On the other hand, ~~In the case of fire event,~~ there will be ~~is~~ some time margin to decide ~~select~~ appropriate evacuation route in the case of fire event. ~~So, flexibility exists for fire evacuation route, but not for criticality evacuation route.~~ For this reason, there ~~may~~ could be some ~~the~~ cases that prefixed evacuation route for criticality event is not appropriate ~~proper~~ for fire ~~evacuation~~ event depending on fire location.		Evacuation routes for fire and criticality events should be considered in design in accordance with national regulations and the safety assessment. They should follow the same routes as far as possible consistent that the aim of reducing the number of different evacuation routes, where this does not impact significantly on fire or criticality safety.		Clarification that the aim is to reduce the number of different evacuation routes where this does not impact on fire or criticality safety.

COMMENTS BY REVIEWER Reviewer: Page: of Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
20	4.69/9	and robust management systems.~~, and;~~	Editorial. Typo	X			
21	4.75/6-7	~~Last~~ Sentence below seems to be uncompleted. "When restoring power following the appropriate emergency instructions for (safety) priorities for equipment (e.g. ventilations systems)" ~~has no verb. Incomplete sentence.~~	~~Editorial.~~ Uncompleted sentence. The sentence "When restoring …" needs more explanation.	X			
22	p31)4.89 t 4.156	Earthquake 4.~~89~~ 91 To ensure that the design provides the required degree … … 4.~~156~~ 158 Infrastructure off-site emergency preparedness …	~~Miss~~ Numbering mistake.	X X			
23	4.90/1	Earthquake 4.~~89~~ 91 To ensure that the design provides the required degree … … 4.~~156~~ 158 Infrastructure off-site emergency preparedness …	~~Miss~~ Numbering mistake.	X X			
24	4.92/1	"Emergency control panels" should be clarified and stated in a footnoted as stated in para. 4.155.	Clarification.		Reference to 4.163 (was 4.155) made		
25	4.114/1	"External fires and explosions" should be moved to a heading.	Editorial.	X			
26	4.118/p39,4	are considered as an option…	~~Editorial.~~ Word omitted.	X			
27	4.120/ 4 and 9	~~Key v~~Ventilation (stack) flows monitoring for environmental discharge ~~monitoring~~;	Better wording.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
28	4.126/4 and 6	~~being tolerant to human error~~ human error resistance/being resistant to human error for rapid, <u>fault-resistant response action,</u> ~~fault-free and fault-tolerant,~~ problem identification.	Better wording. "error-tolerant" sounds like it doesn't lead to accident (loss of safety function) as if even in case of error. ~~means that even if error happens, it doesn't lead to accident (loss of safety function).~~ ~~Next sentence says~~ The following description, "the design to prevent or reduce the likelihood of operator error (e.g. locked valves, segregation and grouping of controls, fault identification, logical displays, segregation of process and safety systems and alarms etc.)." is not about the examples of ~~These examples are not~~ error-tolerant but expected to avoid operator error (reduce the likelihood of operator error.) Therefore, using "error-resistance / fault-resistance" seems to be better.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
29	4.128/4	"optimize protection" should be clarified in a footnote~~d~~.	Clarification.	X			
30	4.134/ a.	A common initial approach is to first allocate an (estimated) internal dose based on experience and then to assess the external radiation protection (shielding, layout etc.).	Para.4.5 says "During normal operation, internal dose is avoided by design", therefore, describing "to allocate an internal dose" in this Para. is inappropriate.			X	An estimate of internal dose can still be made, it may be negligible.
31	4.134/7	Analysis of the actual site conditions (e.g. meteorological, geological and hydrogeological site conditions) ~~and conditions expected in the future~~;	Clarification. To be ~~consisted~~ consistent with NS-R-3 "Site Evaluation for Nuclear Installations". There ~~are~~ is no clear description for such as meteorological conditions of future in NS-R-3, but only for the distribution of the population of the region ~~as the future condition~~.			X	NS-R-3: "2.6. The foreseeable evolution of natural and human made factors in the region that may have a bearing on safety shall be evaluated for a time period that encompasses the projected lifetime of the nuclear installation."
32	4.138/3	representative person(s) ~~people~~	~~Editorial.~~ Similar word duplicated.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
33	4.139/3	additional guidance in Refs. [17], [18], [32~~27~~] and [Y~~28~~]	GS-G-3.3 and DS447 are also relevant (See Comment No.4).	X			
34	4.140/3	from the relevant IAEA standards (Refs. [7], ~~and~~ [8~~13~~] and [Y])	GSR Part 5 is more appropriate than GSR Part 6. DS447 is also relevant (See Comment No.4).	X			
35	4.141/7	from reprocessing (Refs. [19]: Principle7, [8]: Req.8~~{[DS447]}~~).	Editorial	X			
36	4.142/2	the nuclide ~~isotopic~~ composition…	Better wording.	X			
37	4.143/2	the minimization of effluent arising and the maximization of process efficiency,	Clarification.	X			
38	4.144/7	acceptance criteria ~~requirements~~ for disposal (Refs. [8]:Req.12),	To be consistent~~cy~~ with GSR Part 5.		Paragraph reworded but suggestion accepted		
39	Subtitle before 4.147	Management of gaseous and liquid discharges ~~releases~~	To be consistent~~cy~~ with GSR Part 5.	X			
40	4.149/4	Similar provisions to paragraph 4.148~~4.149~~	~~Editorial.~~ Numbering mistake.	X	As Areva #27		

COMMENTS BY REVIEWER Reviewer: Page: of Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
41	4.150/2-3	should be optimized to maximize the 'dilute and disperse' ~~dispersal/ dilution~~ of discharged effluents (Ref. [8 GSR Part 5]: para 4.3) and reduce~~, to a very low level,~~ the discharge of particulates and insoluble	- To be consistent~~cy~~ with GSR Part 5. - To be consistent~~cy~~ with DS447 para.6.43 "Waste that is immiscible with water should be completely excluded from discharge.".		..dilution and dispersal….. …eliminate, as far as practicable….		Editorial Complete elimination is not possible
42	5.4/6	proven at manufacturers' and/or operators' sites…	Clarification.	X			
43	6.6/5	and other small perturbations should also be validated and confirmed.	Editorial. ~~There is no verb.~~ Incomplete sentence.	X			
44	6.9/2 and 4	these ~~are~~ have equivalent ~~identical~~ characteristics If not equivalent ~~identical~~,	Better wording. (Simulate of temporary reagent can't have identical characteristic to the material to be used.)			X	Any difference between the reagent or simulant used and "reality" is the issue here
45	6.15/5	(as a check on arrangements in 6.14~~6.15~~)	~~Editorial.~~ Numbering mistake.	X			
46	6.16/Stage1 11	may not be possible ~~to the same extent~~.	Clarification.				

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
47	6.16/Stage 2, l4	in this stage which won't be impeded	Editorial.		…stage, unimpeded by…		
48	7.25/2nd bullet	The meaning of "on access equipment" should be clarified.	Clarification.	X			
49	7.27/7	(Ref. [1]. paras 9.5~~`~~4-9.56).	Editorial.	X			
50	7.47/3	(Ref. [_]).	Editorial. There is no reference number.	X			
51	7.48/1st bullet	Delete the first bullet.	Duplication. First bullet ~~sentence~~ is ~~the~~ same as the first sentence of this para.	X			
52	7.48 to 7.118	7.~~48~~49. For each reprocessing … 7.~~118~~119. The emergency	~~Editorial.~~ Numbering mistake. Renumbering.	X			
53	7.60/3-4	should be segregated by type ~~(i.e. disposal route)~~, collected and directed to ~~disposal storage~~ an interim storage or disposal route appropriately, in a timely manner.	Clarification. There is the case where the disposal route is not available. Para 7.92, 7.93 and 8.2 use the phrase of "an interim storage or disposal route".	X			

COMMENTS BY REVIEWER Reviewer: Page: of Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
54	7.62/5	and adjusted to match current conditions or brought back to original conditions by decontamination or shielding etc.	Addition. There may be the case that the current condition is not appropriate from the view point of radiation protection.		Addition made to 7.62 (new) and reference added to 7.63 (was 7.62)		Recommendation better placed in 7.62
55	7.62/9	at the boundaries of contaminated areas as necessary during maintenance when the possibility of contamination spreading exists.	Addition.<br ~~Adding~~ Supplemental explanation needed that describes about ~~in which~~ the condition in which the mobile air sampler should be used.		… contaminated areas as necessary, e.g. during maintenance or other operations, when there is a risk of contamination spreading.		
56	7.92/2	chemical, biological and radiological properties to	To be consistent with DS447 para.6.11.	X			
57	7.93/2	the acceptance criteria ~~specifications~~ for existing	To be consistent with GSR Part 5.	X			
58	7.94/2	licensee (para. 4.138~~139~~)	~~Editorial~~ Numbering mistake.	X			
59	7.98/3	requirements of defined or planned storage ~~treatment~~ and disposal routes.	Editorial	X			

COMMENTS BY REVIEWER Reviewer: Page: of Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
60	7.99/3-5	There are no clear definition of "such 'bounding case' sorting criteria" and "remote and/ or automatic detailed characterization." ~~Some~~ Supplemental explanation should be stated in here as a footnote.	Clarification.	X			
61	7.103/3	appropriate management system (Ref. [32~~17~~, Y]).	GS-G-3.3 and DS447 are relevant document (See Comment 4).		(Refs. [32], [33], [27] and [28]).		Pending publication of DS447
62	Subtitle before 7.10	Gaseous ~~Aerial~~ discharges	Editorial	X			
63	7.116/1	"EMERGENCY PREPAREDNESS" should be moved to a heading.	Editorial.	X			
64	7.121	~~7.121.~~7.120 Further information	~~Editorial.~~ Numbering mistake.	X			

COMMENTS BY REVIEWER Reviewer: Page: of Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
65	8.1/3-5	decommissioning strategy~~,~~ and plan ~~and safety assessment~~ are produced early in design so that decommissioning can be included in the optimization of protection by iteration of the design ~~and safety assessment~~ and that sufficient financial resources	Safety assessment for decommissioning is required at the phase of final decommissioning plan, but not at the phase of the initial decommissioning plan. At the phase of the initial decommissioning plan, safety assessment for decommissioning is not required. At the phase of the final decommissioning plan, safety assessment is required.		..and safety assessment (appropriate to the development stage of the decommissioning strategy and plan)… the facility design, decommissioning strategy etc. and safety assessment		Without some form of safety assessment the plan cannot be judged
66	8.2/1-3	The decommissioning plan ~~and safety assessments~~ should be ~~are~~ developed and periodically reviewed throughout the reprocessing facility's commissioning and operational phases (Ref. [13]~~, {[DS450]~~: Requirement~~s:~~10~~7 and 8}~~)	- See above. - Same reason as of comment No. 66. -"should be" is better Wording. Editorial. - Quoting the appropriate reference.	X			

COMMENTS BY REVIEWER Reviewer: Page: of Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
67	8.4/1-2	Consideration should be given for ~~of~~ the implications for decommissioning when modifications to and experiments on the facility, ~~are proposed;~~ such as a c~~C~~omprehensive record	Clarification.	X			
68	Ref	[6] INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANISATION, Occupational Radiation Protection, Safety Standards Series No. {DS453} (revision of RS-G-1.1), IAEA, Vienna ~~(1999)~~.	DS453 is under SPESS Step 12.	X			
69	Ref	[7] INTERNATIONAL ATOMIC ENERGY AGENCY, Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities, Safety Standards Series No. {DS452} (revision of WS-G-2.1 and WS-G-2.4), IAEA, Vienna ~~(2001)~~.	DS452 is under SPESS Step 8.		The new title/publication will be cited when published.		
70	Ref	[8] INTERNATIONAL ATOMIC ENERGY AGENCY, Predisposal Management of Radioactive Waste General Safety Requirements, Safety Standards Series No. GSR Part 5, IAEA, Vienna (2009) ~~{DS447}~~	Editorial	X			
71	Ref	[13] INTERNATIONAL ATOMIC ENERGY AGENCY, Decommissioning of Facilities ~~Using Radioactive Materials~~, Safety Standards Series No. GSR Part 6 ~~WS-R-5~~, IAEA Vienna (201406) ~~{DS450: Decommissioning of Facilities GSR Part 6 (2014) }~~	GSR Part6 has been published.	X			
72	Ref	[X] INTERNATIONAL ATOMIC ENERGY AGENCY, Regulatory Control of Radioactive Discharges to the Environment, IAEA Safety Standards Series No. {DS442} (revision of WS-G-2.3), IAEA, Vienna	DS442 is relevant for this guide, and under SPESS Step 8.	X			

COMMENTS BY REVIEWER Reviewer: Page: of Country/Organization: Japan/Nuclear Regulation Authority (NRA) Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
73	Ref	[Y] INTERNATIONAL ATOMIC ENERGY AGENCY, Predisposal Management of Radioactive Waste from Nuclear Fuel Cycle Facilities, IAEA Safety Standards Series No. {DS447} (revision of WS-G-2.5 and WS-G-2.6), IAEA, Vienna	DS447 is relevant for this guide, and under SPESS Step 12.	X			
74	ANNEX II	Table of SEPARATION PROCESS(p92)L.8 Leakage of Pu with U ~~FP.~~	Editorial.	X			
75	ANNEX II	Table of SEPARATION PROCESS(p93)L.4-7, 9 Table of U PRODUCT TREATMENT PROCESS(p93), L.2-4, (p.94) L.1-2, 5-8 Table of Pu PRODUCT TREATMENT PROCESS(p94), L.3-4, 9-10 "1a" in 4th column should be "1c."	Fire and explosions should be explicitly categorized to "1.Confinement: 1c: Prevention …" not "1a".		Definition of 2c clarified		2c would require and explosion or generation of "new" flammable or explosive material e.g. red oil

COMMENTS BY REVIEWER Reviewer: S. Ramprecht Page.... of.... Country/Organization: Luxembourg Date13/01/2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
NONE							

COMMENTS BY REVIEWER Reviewer: Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety			Page.... of.... Date: **19.11.2014**	RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	General comment		These comments don't address the consistency of the Guide structure to the structure adopted for IAEA guides and don't take into account that NS-R-5 is now under revision.		Noted		These issues were raised, discussed and resolved at the previous stage in NUSSC, WASSC, RASSC etc.
2.	General comment		The Guide involves a lot of very useful, adequate and valuable specific information but it should be re-structured and reduced to make the Guide more logical, clear and to avoid repetitions logical, clear (see specific comments).	X			

COMMENTS BY REVIEWER Reviewer: Page.... of.... Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety Date: **19.11.2014**				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3.	General comment	The repetition of the phrase "in large and complex facilities such as reprocessing facilities" should be avoided	Editorial remark.	X			
4.	1.5	This Safety Guide provides recommendations on meeting the requirements established in (Ref. [1]: Sections 5-10 and Appendix IV). ~~The safety requirements applicable fuel cycle (i.e. storage and reprocessing of spent fuel, associated conditioning and storage of wastes and facilities for the related research and development) are established in (Ref. [1]). The requirements~~ specifically applicable to reprocessing facilities ~~are established in (Ref. [1]: Appendix IV)~~.	This information is not directly related to subject of the Guide.		The safety requirements applicable to *all types of* fuel cycle facilities (i.e. facilities for uranium ore processing and refining, conversion, enrichment, fabrication of fuel including mixed oxide fuel, storage and reprocessing of spent fuel, associated conditioning and storage of waste, and facilities for the related research and development) are established in *the main text* of (Ref. [1]). The requirements specifically applicable to reprocessing facilities are established in (Ref. [1]: Appendix IV).		Clarification that the intent was to indicate that the main text and Appendix IV apply to reprocessing plants
5.	1.8.	This Safety Guide is limited to the safety of reprocessing facility's themselves, the protection of their workers and the public, and the environment ~~around them~~. It does not deal with ~~any impact that the products have on safety for the reactors in which they are to be used or~~ the ancillary process facilities...	This information is apparent and hence excessive.	X			

COMMENTS BY REVIEWER Reviewer: Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety			Page.... of.... Date: **19.11.2014**	RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
6.	2.8-2.15	Recommended to remove to appropriate sections of the Guide.	This information is appropriate and useful but seems to be too specific for this general section.		If specific instances of duplication or missing information are identified by commentators sections will be moved as appropriate		Item were placed in this section if they were assessed as having general applicability but will be moved if more appropriate locations are identified.
7.	4.5-4.9	Should be deleted or removed and included to appropriate sections of the Guide because these issues are considered further on many times in the Guide.	To avoid multiple repetitions (such issues as protection from internal and external exposure, containment and confinement of radioactive materials, criticality etc.)		(4.9 deleted)		See Russia #6

COMMENTS BY REVIEWER Reviewer: Page.... of.... Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety Date: **19.11.2014**				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
8.	4.7	In large and complex facilities such as reprocessing facilities, the design ~~authority~~ *should be developed* ~~a set of standardized designs and conditions for their use,~~ based upon *standardized design solutions and conditions as well* as proven experience ...	It is unclear what does "design authority" mean and why it should develop such issues.		Footnote added giving the organizational role of the design authority: "design authority: the function of an operating organisation with the responsibility for, and the knowledge to maintain the design integrity and the overall basis for safety of the reprocessing facility throughout the full lifecycle of that facility. Design authority relates to the attributes of the operating organisation rather than the capabilities of individual post holders."		Design authority is an accepted term for an important function/ capability in the operating organisation.
9.	4.10-4.12 Sub-Section heading	Design basis accidents, ~~design basis external events~~ and safety analysis	More general title.	X			
10.	4.10.	The definition of a design basis accident (DBA) and design basis external (DBE) event in the context of fuel cycle facilities, can be found in (Ref. [1]: Annex III: para. III-10). The safety requirements relating to DBAs (or equivalent) *conditions and events* ~~and DBEs~~ are established in (Ref. [1]: paras. 6.4- 6.9).	Term "Design basis external events (DBEs)" is not used in NR-S-5 and is mentioned only three times in the Guide but without specifying.		Footnote included with definition for DBE		DBE is a standard term in the IAEA Glossary: design basis external events The external event(s) or combination(s) of external events considered in the design basis of all or any part of a facility.

COMMENTS BY REVIEWER Reviewer: Page.... of.... Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety Date: **19.11.2014**				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
11.	4.13.	~~The likelihood of the design basis accidents (or equivalent) should be minimized, and any associated radiological consequences should be controlled by means of SSCs important to safety~~	This provision doesn't meet the definition of "SSCs important to safety" given in IAEA Safety Glossary (2007 edition) - Plant equipment.			X	Guidance on DBAs not a definition of SSCs.
12.	4.17.	To complement the effectiveness of the static barriers, dynamic containment systems *should be provided to prevent or control the release and the dispersion of radioactive substances and to establish* a cascade of pressure between the environment outside the building and the contaminated material ~~inside and across all static barriers within the building as far as possible.~~	To establish a cascade of pressure is not the only function of the dynamic containment systems. More widely, the definition, functions and examples of dynamic containment systems applied to reprocessing facilities should be defined here.	X	New 4.26 written providing more guidance on dynamic containment and 4.17 & 4.38 deleted		Reduce repetition and clarify

COMMENTS BY REVIEWER Reviewer: Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety			Page.... of.... Date: **19.11.2014**	RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
13.	4.24.	*Fire-fighting features* to prevent the propagation of a fire through ventilation ducts and to maintain the integrity of firewalls should be installed ...	"Fire-fighting features" is a more general term including other fire-fighting features (firewalls).	X			
14.	4.1	1) Confinement of radioactive materials ~~(including removal of decay heat and dilution of radiolysis gases);~~ *2) Cooling and removal of decay heat;*	Cooling and the removal of decay heat should be recognized as a separate safety function because the purposes are not only to prevent uncontrolled environmental releases of radioactive material, exposure of workers and the public, but also to prevent <u>criticality accidents</u> (as stated in para 4.35 of the Draft).		See France #13 and Germany #19 etc.		See France #13 and Germany #19 etc.

COMMENTS BY REVIEWER Reviewer: Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety			Page.... of.... Date: **19.11.2014**	RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
15	4.35-4.36	*New heading:* *Cooling and the removal of decay heat* It is reasonable to separate the section "Cooling and the removal of decay heat"	See comment 13.	X			
16.	4.40	The aim of protection against radiation exposure is *to ensure that exposures are kept below regulatory limits and to optimize radiation protection as established in (Ref. [1]…). Protection against radiation exposure could be provided by implementing the following measures...*	The aim of protection against radiation exposure is not limited by maintaining the doses below the target but also includes optimization as stated in (Ref. [1]).		See France #31		See France #31
17.	4.46.	*Depending* on national and international regulations and the safety assessment, the radiation ~~protection~~ monitoring system *should consist* of principally:	Radiation monitoring systems generally don't have protection function (in contrast with safety protection systems).		Depending on national and international regulations and the safety assessment, the monitoring system for radiation protection should consist principally of:		

COMMENTS BY REVIEWER Reviewer: Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety			Page.... of.... Date: **19.11.2014**	RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
18.	4.46	To avoid the inadvertent spread of contamination by personnel, control points with contamination monitoring equipment for workers (feet, hands and working suits) should be located at the exit airlocks and barriers from potentially contaminated areas and to the extent practical, as close to workplaces with contamination hazards (Ref. [1]: para 6.42).	This provision addresses containment issues and should be moved to appropriate place.	X			
19.	4.48	Criticality hazard should be controlled by design as far as practicable (Ref. [1]: para. 6.43 and Appendix IV: para. IV. 10). *For the prevention of criticality by means of design, the double contingency principle is the preferred approach (Refs. [1]: para. 6.45 and [23]).*	Clarification remark (in consistent with para. 6.45 [1]).	X			
20.	4.50	When required by the safety analysis, the prevention of the precipitation of fissile material within solutions should be *provided e.g. by following measures:*	The key idea of this provision should be to prevent uncontrolled precipitation of fissile material. And then recommendation how to implement it should be provided.	X			

COMMENTS BY REVIEWER Reviewer: Page.... of.... Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety Date: **19.11.2014**				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
21.	4.70	As part of design the fail-safe state of *SSCs important for safety* all active components should be assessed and consideration given (in accordance with a graded approach) to the design or procurement of items to ensure that they fail-safe. Where no fail-safe state can be defined, consideration should be given ~~to eliminating the uncertainty or, where appropriate, strengthening the defense depth (diversity and independence)~~ to ensure *that* functionality *of SSCs important to safety* is maintained *(by diversity and independence).*	1) Fail-safe state of the SSCs important for safely should be provided by design. 2) Clarifying and editorial proposals.	X			
22.	4.72-4.77 Heading	Loss of support systems	Typical support systems related to reprocessing facilities should be listed.	X			
23.	4.72	To fulfil the requirements established in (Ref [1]: para. 6.28) a reprocessing facility should be designed to cope with a loss of support systems such *as supply of* electrical power, *cooling water for process equipment, ventilation systems and compressed air, pneumatic supply etc. that may have consequences for safety*	See comment 13. Only situations when loss of support systems may lead to safety consequences should be considered.	X			

COMMENTS BY REVIEWER Reviewer: Page.... of.... Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety Date: **19.11.2014**				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
24.	4.78-4.82 Sub-Section	Pipe or Vessel Leaks (Corrosion, Erosion and Mechanical Wear)	The information of this section doesn't address erosion and mechanical wear aspects.	X	Title: Pipe of Vessel Leaks		
25.	4.87-4.88 Sub-Section	Use of hazardous chemicals	The term "hazardous chemicals' should be clarified (toxic, corrosion, fire, explosion dangerous?).	X			Two references to appropriate IAEA publications added
26.	4.93 - 4.94	~~Toxic hazards should also be assessed To verify that specific gas concentration meet acceptance criteria. It should be ensured that external toxic hazards would not adversely affect the control of the facility.~~	1) Paras 4.93 and 4.94 duplicate each other. 2) Toxic hazards are out of the scope of this section and should be moved to the proper section.	X			

COMMENTS BY REVIEWER Reviewer: Page.... of.... Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety Date: **19.11.2014**				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
27.	4.100	Flooding Flooding should be separated into specific section.	Flooding could be caused not only by extreme weather conditions but also by other phenomena (high tides, storm surges, overflowing of rivers and upstream structures, coastal erosion, seiches and tsunamis).		There is a separate section on Flooding see France #58 also		
28,	4.107.	*Adequate and reliable control and appropriate* instrumentation should be provided for *monitoring* measuring all the main variables that can affect the processes and the general conditions of the facility (such as radiation *exposure*, *contamination conditions*, release of effluents, criticality *conditions*, fire *conditions)* and for obtaining any other information about the facility necessary for its reliable and safe operation.	Clarification and editorial remark.	X			

COMMENTS BY REVIEWER Reviewer: Page.... of.... Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety Date: **19.11.2014**				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
29	4.110	Within the constraints of the availability of capable equipment, its discrimination, reliability and stability, suitable process locations, realistic calibration options and the ergonomics of maintenance and replacement, including dose considerations and timeliness issues, the preference in reprocessing facilities should be for measurement by:	The purpose of this provision is unclear.				
30.	4.118 Sub-section	**I&C systems important to safety**	It is recommended to move this subsection to the beginning of the section INSTRUMENTATION AND CONTROL (I&C) because it includes general and clarified information related to the section as a whole.	X			

COMMENTS BY REVIEWER Reviewer: Page.... of.... Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety Date: **19.11.2014**				RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
31.	6.4	~~The head of the facility has responsibility for safety throughout the reprocessing facility. To provide advice on commissioning, a Safety Committee should be established at this stage (if one has not already been established). The Safety Committee should consider:~~ *The following issues during the commissioning should be considered:*	1. Responsibility of administration for safety is a very country-dependent issue. 2. Safety Committee is not adopted option for each country and functions of the Safety Committee could be implemented by the Operator without establishing such committee.		"or equivalent role" added to text Footnote added "or equivalent body"		See also existing footnote also Ref. [1]: para. 8.9 "The operating organization shall establish a safety committee (see para. 9.15) to review the commissioning programme and the results of commissioning tests and to provide technical advice to the operating organization."
32	7.27 and 7.28	Should be moved to the section of waste management	These para concern waste management	X			
33	6.7 and 7.29 Heading	The term "foreign material" should be clarified	Editorial remark	X			
34	7.48.	Operational aspects of the control of criticality hazards in reprocessing facilities should include: • Operational aspects of the control of criticality hazards in reprocessing facilities should include:	Repetition	X			

COMMENTS BY REVIEWER Reviewer: Country/Organization: Russian Federation, Moscow/ Scientific and Engineering Center for Nuclear and Radiation Safety			Page.... of.... Date: **19.11.2014**	RESOLUTION			
Comment No.	Para/Line No.	Comment No.	Para/Line No.	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
35	7.63.	Contamination zones should be delineated with proper posting.	This provision is provided by design		Newly contaminated areas should….		Original intent of paragraph

COMMENTS BY REVIEWER Reviewer: E. Liczka Country/Organization: Sweden			Page.... of.... Date13/01/2015	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
NONE							

COMMENTS BY REVIEWER Reviewer: C.G. Jones Country/Organization: United States of America			Page.... of.... Date13/01/2015	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
NONE							

COMMENTS BY REVIEWER Reviewer: Josiane DUBAC / Pierre NOCTURE Page.... of.... Country/Organization: AREVA E&P/AREVA DSQE Date13/01/2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	1.9	The implementation of other safety requirements such as those on the legal and governmental framework and regulatory supervision as established in (Ref. [2]) and those on the management system and the verification of safety as established in (Ref. [3]), are not addressed in this Safety Guide.	Addition of a verb in the sentence	X			
2.	1.11	Annex I shows the typical main process routes for a reprocessing facility	All process routes are not shown in Annex I	X			
3.	2.6	The third level should be provided by the iteration and development of the safety assessment and the design to incorporate appropriate passive and active SSC's with the necessary robust infrastructure (services, maintenance etc.) and appropriate operation instructions and training (Sections 4 and 7).	Typo	X			
4.	3.3	The results of the on-going site evaluation established in Ref [1] Paras 5.9 and 5.10 should be used the periodic safety review (or equivalent) as necessary	Ongoing site evaluation is a requirement (Ref [1] Paras 5.9 and 5.10)		See ENISS "General comment"		See ENISS "General comment"
5.	4.8	As reprocessing facilities are complex facilities with long operational life, provisions to …	Typo		See France #17		
6.	4.15	In most areas of reprocessing facilities, three static barriers (or more as required by the safety analysis) should be provided	Clarification		In reprocessing facilities (in most areas) according to a graded approach three barriers (or more as required by the safety analysis) should be provided.		Combining Areva #6, #7, ENISS "General comment" and Germany #26
7.	4.15	~~These are supplemented by dynamic containment systems as necessary~~	Delete last sentence as it is already in 4.17	X			

COMMENTS BY REVIEWER Reviewer: Josiane DUBAC / Pierre NOCTURE Page.... of.... Country/Organization: AREVA E&P/AREVA DSQE Date13/01/2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
8.	4.20	To be moved: Careful attention should be paid to the need to install effective washing, draining and collection systems to reduce the build-up of contamination and activity and facilitate future decommissioning.	This sentence seems not to apply only to process equipment ventilation system but to the whole process systems of reprocessing facilities. It has to be moved to another point.	X	Added to 4.37		
9.	4.29	Where easily dispersed radioactive materials are processed, where the main hazard is contamination or ingestion, ~~are processed~~ gloveboxes are often the design solution	Correction	X			
10.	4.31	As far as practicable, the final stage of filtration should be located close to the point at which aerials are discharges to the environment occurs	Precision			X	"Filtration" not necessarily the final stage.
11.	4.33	…should be the preferred design for the transfer of liquid process effluents to their treatment facilities and equipment should be provided for…	Precision and correction	X			
12.	4.34	… similar considerations (paras 4.32-4.33)	Correction	X			
13.	4.47	Are presented in Ref. [23]	Correction	X			
14.	4.52	Add: "In accordance with the criticality safety analysis, instruments specifically intended to detect accumulation of fissile material should be installed. These instruments can also be used to verify the fissile inventory of the equipment during decommissioning"	This sentence was in the previous revision of the draft and is specific and important to reprocessing facilities	X			

COMMENTS BY REVIEWER Reviewer: Josiane DUBAC / Pierre NOCTURE Page.... of.... Country/Organization: AREVA E&P/AREVA DSQE Date13/01/2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
15.	4.56	Add a new paragraph stating "The requirements to be applied to the criticality detection systems and associated provisions are defined in Ref [1] Para. 6.50"	The link between NS-R-5 requirements and this safety guide should be made here also	X			
16.	4.69	End of the second bullet: …and robust management system. ~~and~~	Typo	X			
17.	4.73	To the safety analysis requirements, a robust emergency electrical power supply…	Typo	X			
18.	4.92	***External fires and explosions*** 4.92 The reprocessing facility design address external fire and explosion hazards as quantified in the siting evaluation (Section 3).	Bolt italic for a new sub chapter	X			
19.	4.104	Add at the end of the paragraph: "These require the knowledge of such factors as the possible angle of impact or the potential for fire and explosion from aviation fuel. In general, fire cannot be ruled out following an aircraft crash, and so establishing the specific requirements for fire protection and emergency preparedness and response will be necessary"	This is useful and was in the previous draft (para 4.108 of draft 1.4 dated 11 April 2014)	X			
20.	4.94	Delete	Repetition of 4.93	X			
21.	4.103	In accordance with the risk identified during the siting evaluation …	Correction	X			
22.	4.105	Delete	This is related to NNP cold sump. Spent fuel pools are not in the scope of the document		Section on fuel storage ponds deleted		

COMMENTS BY REVIEWER Reviewer: Josiane DUBAC / Pierre NOCTURE Page.... of.... Country/Organization: AREVA E&P/AREVA DSQE Date13/01/2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
23.	4.113	Add at the ned of the first sentence (Ref [1] para 6.6)	Link to an existing and general requirement	X			
24.	4.114	When administrative controls are considered as an option, the criteria…	Correction	X			
25.	4.126	Delete the words ““and optimize protection “ at the end of the first two bullets …	The 3 words were not in para 4.124 of draft 1.4 dated 11 April 2014). Unclear		…and consistent with the optimization of protection (Ref. [5]: principles 11 and 12);		Identification of the source of the requirement. See Japan #28 also.
26.	4.131	End of the sentence , replace “and accident risk criteria” with “emergency criteria”	“Emergency criteria” was used in para. 4.130 of draft 1.4 dated 11 April 2014 and is more clear.	X			
27.	4.149	Similar provisions to paragraph ~~4.149~~ should be made to allow the efficiency of these systems to be monitored.	Could be 4.148 but the status of its 3rd bullet is specific to gas filters	X	4.155 …Analogous provisions ….4.154…		
28.	5.2	2nd sentence: The operating organization should ensure that the relevant recommendations in …	Typo	X			

COMMENTS BY REVIEWER Reviewer: Josiane DUBAC / Pierre NOCTURE Page.... of.... Country/Organization: AREVA E&P/AREVA DSQE Date13/01/2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
29.	6.6	During commissioning, operational limits and normal values for safety significant parameters should be confirmed validated (where established in the safety assessment or set by the regulatory authority) ~~, confirmed~~ In addition any limits (margins) required due to measurement precision or uncertainties and any acceptable variation values (range) due to facility transients and other small perturbations should be established. Considerations in this area should include changing from one facility state to another (e.g. at the start and end of a campaign). ~~Such limits and values may include the type, quantity and state of the fuel to be accepted (including such factors as the 'burn up' and duration expired since the fuel was discharged from the reactor).~~	Correction A verb is missing in the sentence The characteristics of the fuel to be accepted are not a result of the commissioning; they are fixed by the regulatory body in reprocessing facility Authorization Act (Decree or equivalent) and when possible, "validated" during the commissioning stages		See ENISS #15 See Japan #43	X	See ENISS #12
30.	6.9	Where inactive simulates or temporary reagent supplies are introduced for commissioning purposes, care should be taken that ~~these are~~ they have identical characteristics	Correction	X			
31.	6.15	2nd sentence. Replace « (as a check on arrangement in ~~6.15~~ 6.14 »	Correction	X			

COMMENTS BY REVIEWER Reviewer: Josiane DUBAC / Pierre NOCTURE Page.... of.... Country/Organization: AREVA E&P/AREVA DSQE Date13/01/2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
32.	7.5	First main bullet « - Shift and day operations staff (especially maintenance and radiation protection staffs) within the reprocessing facility	Important. Was in in para. 7.5 of draft 1.4 dated 11 April 2014	X			
33.	7.25	Operator including ~~senior~~ management walk-around's should be specified with the aim of ensuring that as far as practicable all area of the facility are subject to regular surveillance with particular attention paid to the recording, evaluating and reporting abnormal conditions. ~~This programme of walk-around's should include a suitable level of independence (for example, including personnel from other facilities on- or off-site~~).	Such walk-a round's can be performed by management (it is not necessary to require senior management) Such a level of independence is not necessary for the regular surveillance.			X	Visibility is an important aspect of safety leadership. Independent scrutiny enhances safety culture by challenging complacency
34.	7.48	Delete the first bullet	Repetition of the first sentence	X			
35.	7.116	EMERGENCY PREPAREDNESS	Tittle of the paragraph	X			

COMMENTS BY REVIEWER Reviewer: Josiane DUBAC / Pierre NOCTURE Page.... of.... Country/Organization: AREVA E&P/AREVA DSQE Date13/01/2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
36.	8.3	Reprocessing facilities should be sited, designed, constructed, operated (maintained and modified) to facilitate eventual decommissioning as far as achievable. Due to their size, complexity and the diverse waste arising during operation and decommissioning; particular care should be taken that the following aspects are addressed throughout the life time of the facility: • Design feature to facilitate decommissioning (e.g. measures to minimize contamination penetrating in the structures) • Physical and procedural methods to prevent the spread of contamination • Consideration of the implication for decommissioning when modifications to and experiments on the facility are proposed • Identification of reasonably practicable changes to the facility design to facilitate or accelerate decommissioning • Comprehensive record preparation for significant activities and events at all stages of the facility life, archived in a secure and readily retrievable form, indexed in a documented, logical and consistent manner; • Minimizing the eventual generation of radioactive waste during decommissioning	Correction of the 8.3 and 8.4 as 8.4 collected sentence without verbs that were initially in a bullet forms inside 8.3	X			
37.	8.4	Delete the beginning and start the sentence with" Requirements in the event of decommissioning being significantly delayed …	See above	X			

COMMENTS BY REVIEWER Reviewer: ENISS Country/Organization: ENISS			Page 1 of 7 Date 21/01/2015	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	General comment	Some editorial errors (1.9, 2.6, 4.8, 4.29, 4.34, 4.47, 4.69, 4.73, 4.92, 4.103, 4.114, 5.2, 6.9, 6.15, 7.48, 7.116 or repetitions (4.15, 4.94)		X			
	General comment	Compared with the previous Draft Status Step 7 (Draft 1.4 dated 11 April 2014) references were expanded to other IAEA standards (site evaluation, safety assessment, construction, emergency preparedness) but the tracking of the deleted texts in the referenced Step 7 document should be done to check nothing is lost		X			
	General comment	Some recommendations "(should forms") are to be written in a more directive way e.g. 3.3, 4.15,		X			
1	1.11	Annex I shows the typical main process routes for a reprocessing facility	All process routes are not shown in Annex I	X			
2	3.3	Replace with: The results of the on-going site evaluation established in Ref [1] Paras 5.9 and 5.10 should be used the periodic safety review (or equivalent) as necessary	Ongoing site evaluation is a requirement (Ref. [1] Paras 5.9 and 5.10) and as such cannot be in a should form. The recommendation here is the use of these evaluation in the periodic safety review as necessary		3.3. "(Refs. [1] and [10]) specify the requirements for site evaluation and ongoing site evaluation and the use of a graded approach for reprocessing facilities. In addition, for reprocessing facilities, care should be taken and an adequate justification made for any grading of the application of site evaluation requirements. Particular attention should be paid to the following during the reprocessing facility's life-cycle (including decommissioning)…"		Modified in response to ENISS "General comment" with the same intent
3	4.15	In most areas of reprocessing facilities, three static barriers (or more as required by the safety analysis) should be provided	Clarification	X			

COMMENTS BY REVIEWER Reviewer: ENISS Country/Organization: ENISS			Page 1 of 7 Date 21/01/2015	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
4	4.20	To be moved after 4.25 Careful attention should be paid to the need to install effective washing, draining and collection systems to reduce the build-up of contamination and activity and facilitate future decommissioning.	This sentence seems not to apply only to process equipment ventilation system but to the whole process systems of reprocessing facilities. It has to be moved to another point, e.g. after 4.25.		See Areva #8		
5	4.31	As far as practicable, the final stage of filtration should be located close to the point at which aerials are discharges to the environment occurs	Precision			X	See Areva #10
6	4.33	…should be the preferred design for the transfer of liquid process effluents to their treatment facilities and equipment should be provided for…	Precision and correction	X			
7	4.52	Add: "In accordance with the criticality safety analysis, instruments specifically intended to detect accumulation of fissile material should be installed. These instruments can also be used to verify the fissile inventory of the equipment during decommissioning"	This sentence was in the previous revision of the draft and is specific and important to reprocessing facilities	X			
8	4.56	Add a new paragraph stating "The requirements to be applied to the criticality detection systems and associated provisions are defined in Ref [1] Para. 6.50"	The link between NS-R-5 requirements and this safety guide should be made here also	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
9	4.104	Add at the end of the paragraph: "These require the knowledge of such factors as the possible angle of impact or the potential for fire and explosion from aviation fuel. In general, fire cannot be ruled out following an aircraft crash, and so establishing the specific requirements for fire protection and emergency preparedness and response will be necessary"	This is useful and was in the previous draft (para 4.108 of draft 1.4 dated 11 April 2014)	X			
10	4.105	Delete	This is related to NNP cold sump. Spent fuel pools are not in the scope of the document		See Areva #22		
11	4.113	Add at the ned of the first sentence (Ref [1] para 6.6)	Link to an existing and general requirement	X			
12	4.126	Delete the words ""and optimize protection " at the end of the first two bullets …	The 3 words were not in para 4.124 of draft 1.4 dated 11 April 2014). Unclear		See Areva #25		
13	4.131	End of the sentence , replace "and accident risk criteria" with "emergency criteria"	"Emergency criteria" was used in para. 4.130 of draft 1.4 dated 11 April 2014 and is more clear.	X			
14	4.149	Similar provisions to paragraph ~~4.149~~ should be made to allow the efficiency of these systems to be monitored.	Could be 4.148 but the status of its 3rd bullet is specific to gas filters	X	As Areva #27		

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
15	6.6	During commissioning, operational limits and normal values for safety significant parameters should be confirmed where established in the safety and assessment and validated where they are set by the regulatory authority) In addition any limits (margins) required due to measurement precision or uncertainties and any acceptable variation values (range) due to facility transients and other small perturbations should be established. Considerations in this area should include changing from one facility state to another (e.g. at the start and end of a campaign). ~~Such limits and values may include the type, quantity and state of the fuel to be accepted (including such factors as the 'burn up' and duration expired since the fuel was discharged from the reactor).~~	Correction A verb is missing in the sentence The characteristics of the fuel to be accepted are not a result of the commissioning; they are fixed by the regulatory body in reprocessing facility Authorization Act (Decree or equivalent) and when possible, "validated" during the commissioning stages	X	See Japan #43	X	In this para. Pre-set limit such as these are being confirmed and validated this may apply to the procedures and instructions or to the setting and performance of SSC's important to safety.
16	7.5	First main bullet « - Shift and day operations staff (especially maintenance and radiation protection staffs) within the reprocessing facility	Important. Was in in para. 7.5 of draft 1.4 dated 11 April 2014	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
17	7.25	Operator including ~~senior~~ management walk-around's should be specified with the aim of ensuring that as far as practicable all area of the facility are subject to regular surveillance with particular attention paid to the recording, evaluating and reporting abnormal conditions. ~~This programme of walk-around's should include a suitable level of independence (for example, including personnel from other facilities on- or off-site~~).	Such walk-a round's can be performed by management (it is not necessary to require senior management) Such a level of independence is not necessary for the regular surveillance.			X	See Areva #33

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18	8.3	Reprocessing facilities should be sited, designed, constructed, operated (maintained and modified) to facilitate eventual decommissioning as far as achievable. Due to their size, complexity and the diverse waste arising during operation and decommissioning; particular care should be taken that the following aspects are addressed throughout the life time of the facility: • Design feature to facilitate decommissioning (e.g. measures to minimize contamination penetrating in the structures) • Physical and procedural methods to prevent the spread of contamination • Consideration of the implication for decommissioning when modifications to and experiments on the facility are proposed • Identification of reasonably practicable changes to the facility design to facilitate or accelerate decommissioning • Comprehensive record preparation for significant activities and events at all stages of the facility life, archived in a secure and readily retrievable form, indexed in a documented, logical and consistent manner; • Minimizing the eventual generation of radioactive waste during decommissioning	Correction of the 8.3 and 8.4 as 8.4 collected sentence without verbs that were initially in a bullet forms inside 8.3	X			
19	8.4	Delete the beginning and start the sentence with" Requirements in the event of decommissioning being significantly delayed …	See above	X			