Comment No.	Para/ Section	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification / rejection
DE001	00 General	In general, the present version of DS478 is already in a good condition and seems to be comprehensive with regard to its contents. The revised Safety Requirements publication on nuclear fuel cycle facilities is fully supported by the German experts for nuclear safety and waste safety. The remaining need for further upgrading and improvements as well as for corrections in the text is addressed in our comments below.	<2> Comment only.	Y			
EN001	00 General	Due to the scope that comprises very different facilities the requirements had unfortunately been directed to the most complex facility, which is a reprocessing facility. Worldwide there exist only a handful of those facilities. Most of the NFCF, more than a hundred, are spent fuel storage facilities according to the IAEA directory. Waste conditioning facilities are also very frequent. For both of these facility types the draft is not adequate and there is not enough guidance on how to apply the graded approach	This document is sized for complex facilities and as a consequence is not friendly for users of smaller ones. The will to delete annexes related to the safety requirements specific to each type of fuel cycle facilities make the text more complicated. Therefore, we consider that significant rewritten is necessary. ENISS believes that the best way should be to keep the previous structure with the specific annexes in order to segregate the requirements for the different types of facilities.			Y	The structure of the document was discussed and agreed by the committees and the Commission.

EN002	00 General	Most of the requirements stated in the draft are of a general nature and already covered by GSRs. There is only a very small part of really specific requirements, Most of them are not easy to devote to specific NFCFs. It is not acceptable according to SPESS that this draft imposes requirements that are already contents of GSRs but with a different wording and without proper quotation in quotation marks. It is also not acceptable that a requirement standard has so much redundant provisions.	For consistency purposes, “Structures, systems and components (SSCs) should be deleted and “Items important to safety” should be kept only Detailed comments follow, marked in red.	Y	SSC has been replaced by "items" except in 6.20(c), 6.120, 6.174 and 4.13 [Step 8 draft]. Use of the term "SSC" is reduced, but not eliminated, consistent with SSR 2/1.		
FR001	00 General	The main general comments identified in the previous revision of the draft are unchanged: • The main one is that this document is sized for complex facilities and as a consequence is not friendly for users of smaller ones. The will to delete annexes related to the safety requirements specific to each type of fuel cycle facilities brings make the text more complicated. • Graded approach is an easy concept, but poor in practice for replacing FCF type specific requirements				Y	The structure of the document was discussed and agreed by the committees and the Commission.
FR002	00 General	Consider replacing “plant” by “facility” in the whole text	Consistency	Y			
FR003	00 General	Consider identification of modifications linked to Fukushima Dai-ichi accident insights	Feedback and lessons learned from Fukushima Dai-ichi accident were foreseen in DPP and could be better highlighted in introduction chapter for example			Y	Feedback and lessons learned from Fukushima Daichii are covered in the document. The syle is consistent with other Safety Standards.
RU001	00 General	It is expedient to revise the structure of this draft document, to shorten its introductory sections and to eliminate repetitions (see our further comments to the text).	This draft document is very large, its introduction is too large (Chapter 2), needlessly repetitive.	Y	Repetition deleted		
RU002	00 General	Protection must be optimized to provide the ~~highest~~ level of safety that can reasonably be achieved.	In correspondence with ALARA principle			Y	The principle is obsolete. Optimization of protection is used, consistent with SF-1.

RU003	00 General	In respect to Sections:RADIATION PROTECTION CONCEPT OF DEFENCE IN DEPTH GRADED APPROACH It is suggested to shorten substantially these Sections to prevent repetition of information that is provided in other Sections of this draft document.	We propose to eliminate repetitions.	Y	The allocation of text between section 2 and section 6 has been improved.		
RU004	00 General	It is suggested to transfer the information presented in footnotes into the main text, if possible (see Comments No.20, 21). It is expedient to minimize the introduction of new definitions using footnotes: they should be presented in Glossary or the terminology established by the IAEA Safety Glossary' is to be used (see Comment No 19).	With a view of user friendliness and in order to ensure compliance of terminology used in footnotes with the terminology in the main text and in the IAEA Safety Glossary'.	Y	Several footnotes now transferred to the main text.		
RU005	00 General	The predisposal and disposal routes for waste shall be considered with the ~~same~~ aim of minimizing the overall human and environmental impacts.	The account must be taken of the impact on a human being as well as the environmental impact.	Y	Added people to Requirements 9, 24, 26. All other references to "environment" either include people or refer to the environment in a different context.		
RU006	00 General	It is suggested to eliminate the majority of requirements related to the particular type of NFC facilities; the requirements considered as general ones are to be kept in the main text. In case it is necessary to point out specific requirements to particular types of NFC facilities, it is expedient to do this directly in the main text.	The requirements are to be kept general.	Y			

RU007	00 General	It is suggested to revise the structure of the draft document.	It is stated that this document establishes safety requirements to NFC facilities. Sections 2-11 of Draft Specific Safety Requirements include safety requirements numbered as “2.1 ...11.4’’. At the same time this document’s structure (in addition to above mentioned items) includes “Requirements 1-78” with separate "consecutive numbering and text in bold letters with sub-head mgs, for example: “Requirement 60: Operational limits and conditions ...”. There are no explanations regarding the practicability of the described structure. Item 1.13 of DS-478: it is stated that the requirements highlighted in bold are to be considered as “overarching” (fundamental, comprehensive), In fact, the distinction of requirements from the point of view of their “importance” contradicts the content of Item 1.1 of this draft document.			Y	The structure of the document was discussed and agreed by the committees and the Commission.
EN021	00 General Section 3	Delete chapter 3	This topic is sufficiently formulated in GSR Part 1 and in DS 478 are no new and specific regulations for NFCFs. If the IAEA does not follow ENISS proposal, it has to be ensured that the same wording is used.			Y	This issue was subject to intensive discussions in previous committee meetings in which the document structure was approved.

EN031	00 General Section 4	Delete all.If you unfortunately should not agree, however, with a complete deletion, the following comments are valid.	This is regulated by GSR Part 2 [5] and in DS 478 there are no specificities regarding NFCF. If for the sake of understanding the standard provisions about the management system are warranted an exact quotation of GSR Part 2 is necessary.			Y	This issue was subject to intensive discussions in previous committee meetings in which the document structure was approved.
SE006	01 General Section 6- 8, pages 27-72	Describe to what extent these sections apply to existing facilities or to new facilities	It is not clear to what extent these full sections apply to existing facilities, or in fact if they apply at all. However, in certain sections, such as 6.72 and 8.2, references are made to existing facilities. The intended applicability for sections 6-8 is requested to be described in detail	Y	Text added to sections 1, OBJECTIVES and 2, STRUCTURE		
USB09	03 General Annex	Change the title to “Derivation of Risk-Informed Performance Requirements.” Remove the term “acceptance criteria” from the figure and title it “Adverse event risk diagram.” Replace “Such limits may be represented in the form of acceptability diagrams such as the following:” to “This may be represented in the form of the following diagram:” Replace “…there is adequate margin and regulatory limits are not exceeded” with “there is adequate margin and to provide reasonable assurance that regulatory limits are not exceeded.” Also, see comment #5. [Now 8]	The way in which the Annex is presented is very confusing. The diagram is a risk matrix and constitutes the basis for deriving accident risk performance requirements. The term “acceptance criteria” is not applicable in this context. One cannot ensure that regulatory limits will be met following an accident.	Y			

CA001	01.001 -	This Safety Requirements publication establishes requirements for all the important areas of safety in all phases of the lifetime of nuclear fuel cycle facilities, establishing requirements for both design and operation1. Non-radiological risks to the public – such as those arising from release of non-radioactive hazardous materials – are not fully addressed in this publication.	snm Paragraph 1.1 states that the document "establishes requirements for all the important areas of safety". In many nuclear fuel cycle facilities, chemical hazards can be more risk significant than radiological hazards. However, the direct risk to the public due to toxic chemical release is not consistently addressed. Some parts of the document address non-radiological risks to the public (e.g. 5.1 and Requirement 7), but others omit it entirely (e.g. 2.4 related to the fundamental safety objective and 2.13 on defence in depth). This limitation should be acknowledged in 1.1. Wherever appropriate, non-radiological hazards should be included (see specific comments below)	Y	Comment accepted and new sentence was added to para 1.12. References to the chemical hazards associated with radioactive materials added in several places throughout the document.		
USB01	01.003	Consider the addition of deconversion facilities to the list or, if applicable, stating that they are covered by other documents	In the U.S., deconversion facilities have the same regulatory requirements as conversion facilities.	Y			
JP001	01.003-6	Associated waste conditioning, effluent treatment and interim storage of radioactive waste ~~facilities for interim waste storag~~e	Last sentence of para 1.3 says "The activities undertaken at these facilities include", therefore the following bullets described here should be referring to activities but not facilities.	Y			

CA002	01.005 -	This publication provides a basis for safety and for safety assessment during all stages in the lifetime of nuclear fuel cycle facilities with particular emphasis on requirements for site evaluation, design, construction, commissioning, operation and preparation for decommissioning. This publication also establishes requirements that must be satisfied to ensure safety.	The first sentence does not read well. "*This publication provides a basis for safety and for safety assessment […] that must be satisfied to ensure safety.* " I would expect there to be requirements that must be satisfied. A facility operating organization does not satisfy a "basis" or a "safety assessment".	Y	The objective of this publication is to establish a basis for safety and for safety assessment for all stages in the lifetime of a nuclear fuel cycle facility by establishing requirements for site evaluation, design, construction, commissioning, operation and preparation for decommissioning that must be satisfied to ensure safety.		
DE002	01.005 -	2nd sentence: "This publication also includes references to IAEA Generic Safety Requirements along with Specific Safety Requirements publications on aspects relating to regulatory supervision, management of safety, and site evaluation of nuclear fuel cycle facilities."	<3> Wording. Elsewhere in this publication, the term 'nuclear fuel cycle facilities' is used.	Y			
USB02	01.007	Remove space before comma in line 2 in the phrase "fuel fabrication ,"		Y			
USA01	01.007	Consider adding facilities that utilize SNM to produce medical isotopes.	Facilities that use SNM to produce medical isotopes manipulate and process SNM through several steps much like a fuel cycle facility.	Y	The comment is valid, para 1.7 amended, to clarify that the requirements on criticality and containment for (re)processing can be applied to these processes utilizing nuclear material at radioisotope production facilities		

DE003	01.007 -	“This Safety Requirements publication applies to nuclear fuel cycle facilities of all types and sizes, including facilities for processing, refining, conversion, enrichment, fuel fabrication, spent fuel storage, and reprocessing of nuclear material and supporting ancillary facilities. The types of nuclear materials covered by these requirements include radioactive materials used as fissile or fertile fuels in thermal and fast reactors. In addition to processed uranium, these include plutonium, MOX fuel, thorium breeder material and other types of experimental fuels including tritium. The ancillary facilities covered by these requirements include ~~interim spent fuel storage and~~ nuclear fuel cycle research and development facilities. Facility-specific requirements for the predisposal management of wastes and the management of effluents containing radioactive and associated hazardous chemicals are also included. Facilities for mining and milling of ores are not within the scope of this publication.”	<1> Spent fuel storage facilities located on their own sites (i.e. not collocated with other nuclear facilities such as a nuclear power plant, a research reactor or a reprocessing plant) are not ‘ancillary facilities’. Instead, they constitute an own type of nuclear installations. According to the revised definition which has been endorsed at the 32nd CSS meeting in October 2012, the term ‘nuclear installation’ means “any nuclear facility subject to authorization that is part of the nuclear fuel cycle, except facilities for the mining or processing of uranium ores or thorium ores and radioactive waste disposal facil-ities” (see presentation to agenda item 6.1 “Revision of the Safety Glossary” at the 32nd CSS meeting). In contrast to radioactive waste, liquid and gaseous effluents are not disposed of. Consequently, there is no ‘predisposal management’ of such effluents.	Y			
EN003	01.007 -	Facility-specific requirements for the predisposal management of wastes and effluents containing radioactive ~~and associated hazardous~~ chemicals are also included.	Deletion as outside the scope.			Y	Reworded
RU008	01.007 -	There is a need for clarification.	1) The third sentence: tritium is categorized as experimental fuel. 2) The fourth sentence: there are doubts regarding the fairness of categorization of the interim spent fuel storages and research institutes as "‘auxiliary facilities”.	Y			

DE004	01.008 -	"This publication establishes specific requirements which help to meet the performance-based general requirements of IAEA standards covering radiation protection in Ref. [2] and the ~~pre-disposal~~ predisposal management of radioactive wastes in Ref. [3]. Where there is overlap or uncertainty regarding the application of this publication and other IAEA safety requirements ~~and guidance~~ publications, these standards can be regarded as complementary."	<2> Specific Safety Requirements such as DS478 are complementary to the General Safety Requirements GSR Part 1 to GSR Part 7. However, they are not complementary to any Safety Guides. Instead, the requirements established in DS478 are implemented through a set of Specific Safety Guides (namely SSG-5, SSG-6, SSG-7, SSG-15, DS360, and DS381).	Y			
JP002	01.008/2 and 09.107/5	pre-disposal → predisposal	Editorial.	Y			
EN004	01.009 -	~~All the requirements established here are to be applied unless it can be justified that, f~~For a specific facility, the application of certain requirements ~~may~~ shall be graded.	The graded approach is essential for this standard as it is written with the most complex facility in mind.	Y			
USB03	01.009c	Revise statement related to industrial hazards to identify those industrial hazards that could affect the safety of nuclear material: "For instance, a diesel spillage during a transfer of diesel generator fuel is not addressed unless it affects [could affect] the nuclear safety of the facility but a HF release due to the escape and hydrolysis of uranium hexafluoride is"	The document should be clear that if there is the potential for an industrial hazard to impact nuclear safety, it must be analyzed. For instance, if a diesel spill could result in an explosion that could rupture UF6 cylinders, that hazard should be analyzed and mitigated as appropriate. If the spill could not present such a hazard, there is no concern	Y			
CA003	01.010 - c	Delete item (c) from 1.10.	1.10 (c) specifically excludes non-radiological hazards from the scope of the document, except where they impact nuclear safety. However, many places in the document consider the direct impact of non-radiological hazards on the public, e.g. Requirement 7.	Y	Instead of deleting this bullet, which reamains true, additional text has been added to clarify Requirements 7, 15, 40, 41 and 42 in the revised draft. These were Requirements 7, 16, 43, 44 and 45 in the previous draft.		

SE001	01.010 (c), page 3	Review for consistency	The limitation regarding conventional industrial safety, as stated in section 1.10, is not always clear or considered in the standard, e.g. section 6.42, Requirement 45, section 6.176, Requirement 73 and section 9.122	Y	Instead of deleting this bullet, which reamains true, additional text has been added to clarify Requirements 7, 15, 40, 41 and 42 in the revised draft. These were Requirements 7, 16, 43, 44 and 45 in the previous draft.		
EN005	02.001 -	Restricting the likelihood of events that might lead to a loss of control over a nuclear chain reaction or ~~any other source of radiation~~ a loss of confinement of radioactive materials or a radiation exposure also requires control over chemical and other non-nuclear hazards of nuclear fuel cycle facilities.	The main risks of FCFs are criticality, loss of confinement and radiation exposure	Y	Restricting the likelihood of events that might lead to a loss of control over a nuclear chain reaction or loss of confinement of radioactive material, or radiation exposures of people also requires control over chemical hazards and other non-radiological hazards of nuclear fuel cycle facilities.		
FR004	02.001 -	The fundamental safety objective is to protect people, including workers, and the environment	Proposed modification enhances that radiation protection in the fuel cycle facilities is first aimed at protecting workers without modifying SF1 principle	Y			
FR005	02.001 -	Restricting the likelihood of events that might lead to a loss of control over a nuclear chain reaction or ~~any other source of radiation~~ a loss of confinement or a radiation exposure also requires control over chemical and other non-nuclear hazards of nuclear fuel cycle facilities.	The main risks of FCFs are criticality, loss of confinement and radiation exposure	Y	See response to EN005, above.		

USA02	02.002	Add at the end of Item (a): …to the environment; "in order to achieve the desired objectives in terms of health and safety protection and minimizing risks from radioactive and associated hazardous materials."	We recognize that the fundamental safety objective places emphasis on radiation risks. However, for fuel cycle facilities, risks from other associated hazardous materials (e.g.; chemical) could be as important and need to be conspicuously indicated. Therefore, the objective should cover protections from all health and safety risks associated with the licensed fuel cycle activity. For example, the US NRC regulation in 10 CFR 70.62(c) defines the radiation hazards, chemical hazards, and facility hazards that must be addressed.	Y	This text is a direct quotation from SF-1 and cannot be changed. Paragraph 2.3 was intended to cover this aspect, and has been further expanded to emphasize this point.		
EN006	02.002 -	~~The fundamental safety objective is to protect people and the environment from harmful effects of ionizing radiation.~~ This above fundamental safety objective	Avoid repetition of the text of §2.1	Y			
FR006	02.002 -	~~The fundamental safety objective is to protect people and the environment from harmful effects of ionizing radiation.~~ This above fundamental safety objective	Avoid repetition of the text of §2.1	Y			
RU009	02.002 -	...'"protect people and the environment against the radiological and chemical, consequences of normal and accidental , releases of radioactive or other : hazardous materials".	This will make it possible to take fuller account of risks inherent to NFC facilities.	Y	The text of para 2.2 is a direct quotation from SF-1 and cannot be changed. Paragraph 2.3 was intended to cover this aspect, and has been further expanded to emphasize this point.		
USA03	02.003	The reference cited at the end of section 2.3 is currently [1]. More precise references for this section are 11 and 3, respectively. The recommended change is to remove the current information at the end of section 2.3 ([Ref [1]) and replace it with [Refs [11, 3].	Completeness and accuracy.	Y	The text of para 2.3 is a direct quotation from Ref. [1], so references [10] and [11] have been introduced with a new sentence outside the quotes.		
FR007	02.003 -	… construction, commissioning and operation. **Decommissioning, closure, transport of radioactive material are treated in other documents (consider giving the reference).**	These three issues are not really addressed in this document			Y	It does not describe the scope of the document.

RU010	02.003 -	There is a need for clarification.	The lifetime stages of a NFC facility, that are presented in Item 2.3,, cover stages of “planning” and "manufacturing”, The scope of these stages is not provided by the IAEA Safety' Glossary,			Y	This paragraph is a direct quotation from SF-1. These terms are better explained.
EN007	02.006 -	The requirements presented in this publication are derived from the fundamental safety objective of protecting people and the environment, and the related safety principles Ref. [1]: ~~Principle 1: Responsibility for safety~~ ~~The prime responsibility for safety must rest with the person or organization7 responsible for facilities and activities that give rise to radiation risks.~~ ~~Principle 2: Role of government~~ ~~An effective legal and governmental framework for safety, including an independent regulatory body, must be established and sustained.~~ ~~Principle 3: Leadership and management for safety~~ ~~Effective leadership and management for safety must be established and sustained in organizations concerned with, and facilities and activities that give rise to, radiation risks.~~ ~~Principle 4: Justification of facilities and activities~~ ~~Facilities and activities that give rise to radiation risks must yield an overall benefit.~~ ~~Principle 5: Optimization of protection~~ ~~Protection must be optimized to provide the highest level of safety that can reasonably be achieved.~~ ~~Principle 6: Limitation of risks to individuals~~ ~~Measures for controlling radiation risks must ensure that no individual bears an unacceptable risk of harm.~~ ~~Principle 7: Protection of present and future generations~~ ~~People and the environment, present and future, must be protected against radiation risks.~~ ~~Principle 8: Prevention of accidents~~ ~~All practical efforts must be made to prevent and~~	There is no need for repetition of these requirements here and in an incorrect reduced way .			Y	It should be kept for the benefit of the readers. A similar style was used in other Safety Standards for NPP and research reactors.

PK001	02.006 principle 7	***Measures to ensure that*** people and the environment, present and future, must be protected against radiation risks.	i) For consistency of the sentence structure with the previous sentence (principle 6). ii) The present sentence is more like the safety objective and not a principle.			Y	This text is a direct quotation from SF-1 and cannot be changed. Paragraph 2.3 was intended to cover this aspect, and has been further expanded to emphasize this point.
EN008	02.007 -	In order to satisfy the safety principles, it is required to ensure that for all operational states of a nuclear fuel cycle facility, doses from exposure to radiation within the installation or exposure due to radioactive discharges from the installation are kept ~~within operational limits and~~ below the dose limits and kept as low as reasonably achievable (optimization of protection and safety Ref. [2]).	Deleted text is not in Ref. 2. When quoting other Standards it has to be with quotation marks and have the identical text.			Y	This text is not a quotation. See paras 3.32, 3.123 and 3.133 and glossary in Ref [2] .
FR008	02.007 -	In order to satisfy the safety principles, it is required to ensure that for all operational states (including normal operation and anticipated operational occurrences) of a nuclear fuel cycle facility,	To define precisely operational states	Y			
FR009	02.007 -	doses from exposure to radiation within the installation or exposure due to radioactive discharges from the installation are kept as low as reasonably achievable (optimization of protection and safety Ref. [2]) and kept within operational limits and below the dose limits.	To point out the optimization before any reference to the dose limits defined in regulations.	Y			
EN009	02.009 -	Such measures and arrangements include: engineered safety features~~; safety features for design extension conditions9, o~~n-site emergency plans and procedures established by the operating organization; and	Not part of Ref. 2			Y	The reference is GSR Part 7
USB04	02.011	Change “independent layers of provisions” to “independent layers of protection.”	“Layers of protection” better describes the setup of barriers needed	Y			

USA04	02.011	Replace "…~~so that if a failure was to occur, it would be detected and compensated for or corrected by appropriate measures.~~" With "… so that if a failure was to occur in any one of these layers, it would be mitigated through successful implementation of the other layers."	This change expounds upon the importance of independent layers of protection of DID that is discussed earlier in the paragraph. Current wording is vague and somewhat unrelated to the rest of the paragraph.	Y	This is to ensure that all safety related activities are subject to independent layers of protection (or barriers), so that if a failure were to occur in any one of these layers, it would be detected and corrected through successful application of measures in the other layers.		
USB05	02.013	Change "~~levels of defence~~" to "levels of protection." Change all subsequent "~~level of defence~~" phrases in Para 2.13 sections 1, 2, 3, 4, and 5 and, if needed, in the reset of the document, to "levels of protection."	"Layers of protection" better describes the setup of barriers needed.			Y	The use of "levels of defence" is used for consistency with the IAEA glossary from which the text is replicated.
EN010	02.013 -	The graded approach is applied to the concept of defence in depth in nuclear fuel cycle facilities. There are five levels of defence, which according to the graded approach may be applied as appropriate.	For clarification about the use of the graded approach.			Y	This is already implied by the line above. The objective is to encourage consideration of all levels of defence in depth.

EN011	02.013 (1)	The purpose of the first level of defence is to prevent deviations from normal operation and the failure of items important to safety. This leads to requirements that the facility be soundly and conservatively sited, designed, constructed, maintained operated and modified in accordance with the management system and appropriate and proven engineering practices ~~such as the application of redundancy, independence and diversity~~. To meet these objectives, careful attention is paid to the selection of appropriate design codes and materials, and to the quality control of the manufacture of components and construction, of the facility. Design options, including process selection, that reduce the potential for internal hazards also contribute to the prevention of accidents at this level of defence. Attention is also paid to the processes and procedures involved in design, manufacture, construction and in-service inspection, maintenance and testing, to the ease of access for these activities, and to the way the facility is operated and to how operating experience is utilized. This process is supported by a detailed analysis that determines the requirements for operation and maintenance of the facility and the requirements for quality management for operational and maintenance practices;	Redundancy, diversity and independence are not “proven engineering practices” for DID level 1, but design principles for achieving a required reliability of safety functions.	Y			
FR010	02.013 (1)	This leads to requirements that the facility be soundly and conservatively sited, designed, constructed, maintained, operated and modified in accordance with the management system and appropriate and proven engineering practices such as the application of redundancy, independence and diversity **as far as required.**	Consistency with a graded approach	Y	The reference to redundancy, independence and diversity has been removed so this comment is addressed.		
EN012	02.013 (2)	This second level of defence necessitates the provision of specific systems and features in the design, the confirmation of their effectiveness through safety analysis, and the establishing of operating procedures to prevent such initiating events, or to minimize their consequences, and to return the ~~plant~~ facility to a safe state11;	To be in line with scope of the draft.	Y			

FR011	02.013 (2)	The aim of the second level of defence is to detect and control deviations from normal operational states in order to prevent anticipated operational occurrences at the facility from escalating to accident conditions10. This is in recognition of the fact that ~~postulated initiating events~~ abnormal operation and failures are likely to occur over the operating lifetime of a nuclear fuel cycle facility, despite the care taken to prevent them. This second level of defence necessitates the provision of specific systems and features in the design, the confirmation of their effectiveness through safety analysis, and the establishing of operating procedures **to minimize the consequences of these abnormal operation and failures, and to return the plant to a safe state11**	Postulated initiating event is an event identified during design as capable of leading to anticipated operational occurrences or accident conditions. Accident conditions are the target of the third level of defence in depth. Prevention of abnormal operation and failures is the aim of the first level of the defence in depth.	Y	Deleted abnormal events and failures instead, for consistency.		
EN013	02.013 (3)	These unlikely events are anticipated in the design basis for the nuclear fuel cycle facility, and inherent and/or engineered safety features, fail-safe design, ~~additiona~~l ~~equipment~~ and procedures are provided to control their consequences ~~and to achieve stable and acceptable states of the facility following such events~~. ~~This leads to the requirement that~~ These engineered safety features shall be capable of transferring the nuclear fuel cycle facility first to a controlled state and subsequently to a safe state, and maintaining at least one physical barrier12 for the confinement of radioactive material. The radiological safety objective is to ~~have no~~ prevent releases or radiation levels requiring off-site protective measures ~~and returning the plant to a safe state~~.	“Additional” to what?. There is also an unnecessary mixture of controlled, stable and safe state, which leads to irritation. Objective on Level 3 is to achieve always a controlled state and then a safe state. Furthermore radiological objective is not to have no releases, but to prevent releases requiring off-site protective measures (see also SSR 2/1 new version). Radiation levels requiring off-site measure are encompassed by the releases.	Y	Accepted with minor editorial changes.		

EN014	02.013 (3)	This leads to the requirement that engineered safety features shall be capable of transferring the nuclear fuel cycle facility first to a controlled state and subsequently to a safe state, and maintaining at least one ~~physical~~ static barrier~~12~~ for the confinement of radioactive material.	VGB - A dynamic barrier is not always required, especially for fuel cycle front-end facilities Footnote 12 should be deleted	Y	The explanation regarding static and dynamic barriers has been moved from the footnote, which no longer exists; This barrier may be provided by a combination of a 'static' barrier with a complementary 'dynamic' barrier (e.g. a ventilation system), which together provide effective confinement of radioactive material.The most important objective for this level is to prevent releases of radioactive material and associated hazardous material or radiation levels that require off-site protective actions.		
FR012	02.013 (3)	This leads to the requirement that engineered safety features shall be capable of transferring the nuclear fuel cycle facility ~~first~~ to ~~a controlled state and subsequently to~~ a safe state, and maintaining at least one physical static barrier~~12~~ for the confinement of radioactive material.	"Controlled state" is not usual for fuel cycle facilities. It is reactor related. The objective is to set the facility in a safe state, with or without an intermediate state. A dynamic barrier is not always required, especially for fuel cycle front-end facilities	Y	The explanation regarding static and dynamic barriers has been moved from a footnote; This barrier may be provided by the combination of a "static" barrier with a complementary "dynamic" barrier (e.g. ventilation system), which together provide effective containment/confinement.		
FR013	02.013 (3)	The radiological safety objective is **first** to **return the facility to a safe state with** ~~have no~~ releases or radiation levels requiring **only limited on-site protective measures and, if not achievable at least no releases or radiation levels requiring** off-site protective measures ~~and returning theplant to a safe state~~	The objective of no off-site protective measures is generally not enough ambitious. In the SSR-2/1 « This leads to the requirement that inherent and/or engineered safety features, safety systems and procedures be provided that are capable of preventing damage to the reactor core or significant off-site releases and returning the plant to a safe state.	Y	Reworded to; The most important objective for this level is to prevent releases of radioactive material and associated hazardous material or radiation levels that require off-site protective actions..		

AM001	02.013 (4)	After first sentence it is proposed to add "These unlikely events are taken into account in the design extension conditions for the nuclear fuel cycle facility, and additional appropriately qualified equipment and procedures are provided to minimize their consequences and to prevent cliff-edge effects."	To introduce design extension conditions in the defense-in-depth principle.	Y	*Agree- The wording of Level 4 in DS478 has been simplified to realign with SSR2/1 and SSR3. Para 6.74 in the new draft now states;* For facilities where design extension conditions have been identified by the analysis, additional appropriately qualified features. *The remainder of the suggested sentence reworded.*		
EN015	02.013 (4) Footnote 13	~~A severe (nuclear fuel cycle) accident is any event affecting the facility resulting in off-site radiological consequences equal to or greater than the high contamination level or radiation level criteria for design extension conditions i.e. an event more severe than a design basis accident.~~	This is a misunderstanding of the DEC concept – DEC is not considered as a design basis accident!	Y	References to severe accident have been removed.		
FR015	02.013 (5)	The purpose of the fifth ~~and final~~ level of defence				Y	Consistent with IAEA glossary.
EN016	02.014 -	Similar considerations apply to the prevention ~~or~~ of high radiation levels, particularly those arising from an uncontrolled criticality event, where external exposure of workers or the public is possible	Typo	Y	This paragraph repeated concepts elsewhere in DS478 and has been deleted.		
FR016	02.014 -	Similar considerations apply to the prevention ~~or~~ of high radiation levels, particularly those arising from an uncontrolled criticality event, where external exposure of workers or the public is possible	Typo	Y	This paragraph repeated concepts elsewhere in DS478 and has been deleted.		
AM002	02.015 -	After "These analyses are independently reviewed by the operating organization and by the regulatory body" sentence, it is proposed to add " Independent review should be supported by audit calculations for bounding cases"	In our opinion, effective review should include independent audit calculations.	Y	This paragraph repeated concepts elsewhere in DS478 and has been deleted.		

EN017	02.015 -	~~The defence in depth concept is applied mainly through the safety analysis and the use of sound engineering practices based on research and operational experience. This analysis is carried out in the design to ensure that the safety objectives are met. It includes a systematic, critical review of the ways in which the nuclear fuel cycle facility structures, systems and components16 could fail and identifies the consequences of such failures. The safety analysis examines: (1) All planned normal operational modes (including maintenance and shutdown) of the nuclear installation, and its performance during;~~ ~~(2) Anticipated operational occurrences;~~ ~~(3) Design basis accident conditions and, if necessary;~~ ~~(4) Event sequences that may lead to design extension conditions (Section 6 and Requirement 22)~~ ~~Requirements for the safety analysis in design are presented in Section 6 of this publication. These analyses are independently reviewed by the operating organization and by the regulatory body (se~~e Section 3).	There is no added value here for this para, as other paras are dealing with the safety assessment and there is even special IAEA safety standard document for it (GSR Part 4).	Y	This paragraph repeated concepts elsewhere in DS478 and has been deleted.		
FR017	02.015 -	(3) design basis accident conditions and, ~~if necessary~~,	It is always necessary to consider this, according to DiD	Y	This paragraph repeated concepts elsewhere in DS478 and has been deleted.		
DE005	02.015 Footnote No. 16	“See (Ref. ~~[2]~~ [9]) for definition.”	<2> Wrong reference is given in the footnote. The term ‘structures, systems and components’ is not defined in GSR Part 3 but in the Safety Glossary.	Y	Deleted with parent paragraph, which repeated concepts elsewhere in DS478 and has been deleted.		
EN018	02.016 -	Nuclear fuel cycle facilities have diverse natures and types. Their design and operating characteristics may vary significantly and present a variety of different hazards. Application of a graded approach ensures that the extent to which ~~control~~ measures are applied to the safety of facilities are commensurate, to the extent ~~possible~~ practicable, with the likelihood and possible consequences of a loss of control.	“control” not needed and it should be “practicable” not “possible”	Y	We agree with the suggested changes but the second sentence has been deleted completely, because it repeated concepts elsewhere in DS478.		

EN019	02.017 -	~~The attention given and level of detail involved in developing and approving the safety analysis and incorporating safety into the design of the facility and to ensuring the safety of the facility throughout its lifetime is required to be commensurate with the radiological and chemical hazards associated with the facility.~~	Content included in 2.16 and 2.18, but might give the impression, that safety can be graded, which is not the case – safety always has to be ensured ("The attention given … to ensuring the safety of the facility …to be commensurate with the radiological… hazards…").	Y			
FR018	02.017 -	throughout its lifetime **are** required to be commensurate		Y	Agree, however, this paragraph has been deleted, because it repeated concepts elsewhere in DS478		
USB06	02.018	Change "requirements ~~in~~ this publication" to "requirements of this publication."	"requirements in this publication" is confusing	Y	"In" has been changed to "of" wherever possible in DS478. This sentence moved to Requirement 11.		
USB07	02.018	Rephrase the last sentence to "The requirements of this document shall apply in full if no such justification is provided and approved."	The rephrasing of the sentence is needed to make it clear and appear as a requirement.	Y	Changed and moved to Requirement 11.		
EN020	02.018 -	Where certain risks are ~~demonstrated to be~~ non-existent or very small, application of some features or procedures required for other higher risk/hazard facilities may be of less importance or unnecessary. In such situations, the graded approach can be used in applying certain requirements in this publication~~. No requirements can be waived. However, based on an appropriately approved assessment,~~ the degree of application of certain requirements may be reduced, or in some cases effectively be "graded to zero" with an appropriate justification ~~in the safety case.~~ The~~se~~ requirements stated in this document apply in full, without grading, to a small number of large nuclear fuel cycle facilities.	The grading is not only directed towards the applicant, but also to requirements for certain facilities in national regulation. It should be formulated in an open way.	Y	We agree that national regulation has a role in application of the graded approach. This paragraph is now much shorter, with text transferred to Requirement 11, where the regulatory role is clarified (para 6.29 in latest draft).		

USA05	02.018(3)	Delete "…~~or in some cases effectively be "graded to zero". It is also recommend that the term "graded to zero" be deleted if it exists in any other portion of the document~~t.	Earlier in the document (1.9), it is stated that all requirements in the document should be addressed, but that some requirements could be graded, given the type/nature of facility and the risk. We agree with this but don't agree with use of the term "graded to zero" in 2.18 or any other place in the document because it implies that a requirement does not need to be addressed. Item 2.18 would be clearer and more effective by simply deleting this term.	Y	Para. 2.18 has been simplified and the first paragraph of Requirement 11 clarified.		
AM003	03.001	These principles are established in (Principles 2 and 3 of Ref. [1]).	It seems that sentence is not completed.	Y			
USA06	03.002	Consider adding requirements for the security of chemicals used at fuel cycle sites.	Certain states have enacted legislation requiring a Chemical Facility Anti-Terrorism Standards (CFATS) program that identifies and regulates high-risk chemical facilities to ensure they have security measures in place to reduce the risks associated with these chemicals	Y	Added text to para 3.2 and 11.2.		

EN022	03.002 -	General requirements to fulfil these principles are established in “Governmental, Legal and Regulatory Framework for Safety” (Ref. [4]). ~~This publication covers the essential aspects of the governmental and legal framework for establishing a regulatory body and for taking actions necessary to ensure the effective regulatory control of facilities and activities - existing and new - utilized for peaceful purposes. Other responsibilities and functions are also covered, such as liaison within the global safety regime and liaison for providing the necessary support services for the purposes of safety (including radiation protection), emergency preparedness and response, the interface with nuclear security18, and the State system of accounting for, and control of, nuclear material. These general requirements apply to the general legal and governmental infrastructure for the safety of nuclear fuel cycle facilities during site evaluation, design, construction, commissioning, operation, modification and preparation for decommissioning. A graded approach commensurate with the potential hazards of the facility shall be used in application of these requirements (Section 2: ‘Graded Approach’).~~	There is no added value or additional guidance to GSR Part 1 in these paras here, neither are they needed for understanding of the other context of the requirements – we suggest deletion.			Y	Kept for the benefit of the reader, It is also in other Safety Standards.
FR019	03.002 -	Consider explaining in a footnote what is the « global safety regime”		Y	Reference to GSR Part 1 added		
EN023	03.003 -	~~3.3. The State shall establish and maintain an independent body for the regulatory control of facilities and activities (Ref. [4]: Requirements 3, 4). To be effective, the regulatory body shall be provided with the statutory legal authority necessary to ensure that it can discharge its responsibilities and fulfil its functions. This includes the authority to review and assess safety related information submitted by the operating organization during the authorization process and to ensure compliance with the relevant regulations (e.g. by issuing, amending or revoking authorizations or their conditions), including carrying out compliance inspections and audits19, taking enforcement action and, providing other competent authorities or the public with information, as appropriate.~~	See above	Y	A footnote relating to audits has been moved Section 3 under Requirement 2.		

EN024	03.004 -	~~Every project for a new nuclear fuel cycle facility shall follow an authorization process that comprehensively addresses all safety aspects, Ref. [4]. The authorization process is ongoing, starting at the site evaluation stage and continuing up to and including the decommissioning of the nuclear facility.~~ Different types of authorization shall be obtained for the different stages in the lifetime of a facility (Para 4.29 of GSR Part1). The authorization process may vary among Member States but ~~the major stages of the authorization process~~ for nuclear fuel cycle facilities ~~shall include:~~ the stages in the lifetime usually include: (6) shutdown or termination of operation	The current para is misleading, saying that there is an "ongoing authorization process" – it must be clear, that each process part ends with an authorization – we suggest to stick to GRS Part 1 wording. Shutdown is inappropriate for e.g. a storage facility. See also 6.77. and 6.82.	Y	….the lifetime of a nuclear fuel cycle facility usually includes the following:		
RU012	03.004 -	"Every project for a ~~new~~ nuclear fuel cycle facility shall follow an authorization process that comprehensively addresses all safety' aspects"...	Activity' of a NFC facility (the new one or being operated) in the sphere of the use of atomic energy' is subject to licensing through all stages of its lifecycle.	Y	Agree entirely. This concept is now part of Requirement 1.		
JP003	03.005 footnote 21 / 2	See (Ref. [2] and [9]) for definitions	GSR Part3 defines only "license". Safety case is defined in IAEA Safety Glossary (2007 ed.).	Y			

DE006	03.005 Footnote No. 21	“Any differences between the scope of the licensing documentation and the safety case (e.g. financial information, multiple approvals, and regulatory specifications) are outside of the scope of this publication. See (Ref. ~~[2]~~ [9]) for definitions.”	<2> Wrong reference is given in the footnote. The relevant information is not provided in GSR Part 3 but in the Safety Glossary.	Y	The glossary is the correct reference for "safety case" and [2] explains licensing documentation. Both references in footnote.		
EN025	03.006 Requirement 1:	Licensing documentation The operating organization shall establish and ~~justify~~ demonstrate the safety of its facility through a set of documents known as the licensing documentation (or ‘safety case’). The licensing documentation shall ~~provide the basis~~ contain information concerning ~~for the safe~~ siting, design, construction, commissioning, operation and decommissioning of the facility, including ~~the justification for changes~~ modifications.	It is not a question of justification but rather a question of demonstration. Change of text for clarification.	Y	demonstrate - agreed; modifications - agreed; basis - not agreed for consistency with other publications.		

FR020	03.007 -	The safety **case** shall describe the facility, all activities with safety significance in detail **and the operational limits and conditions**, including the limits on facility inputs and outputs (e.g. burn up and enrichment). The safety analysis report shall discuss the application of the safety principles and criteria in the design for the protection of operating personnel, the public and the environment. The safety analysis report shall contain an analysis of the hazards associated with the operation of the facility and shall demonstrate compliance with the regulatory requirements and criteria.	The limits on facility inputs and outputs are included in the "operational limits and conditions" (general operating rules). Consider introducing the safety case, including the SAR and the OLC.	Y	Please read the previous paragraph, which introduces the safety case in the manner described. Word "limits" has been removed from this para and other changes to wording of this para made in clarification.		
RU013	03.007 -	"'The safety analysis report shall describe all activities with safety' significance in appropriate detail, including the limits on facility inputs and outputs", ~~(e.g.: burn up and enrichment~~".	The completeness of the information submitted depends on many factors. The example provided in brackets is not significant. It does not have a general nature.	Y	in adequate detail		
JP004	03.007/3	in the design for the protection of ~~operating personnel~~ workers, the public and the environment.	Amendment for the better wording.	Y			
EN026	03.008 -	The safety functions, associated safety limits and main items important to safety22 shall be identified in the safety analysis report., which shall also provide ~~details of the emergency arrangements for the facility and~~ details about the operating organization, the conduct of operations and the management system throughout the nuclear fuel cycle facility life. The safety case provides details of the emergency arrangements for the facility.	According to member states, the emergency arrangements are described either in the safety analysis report or in another piece of the safety case.	Y			
FR021	03.008 -	The safety functions, associated safety limits and ~~main~~ items important to safety22 shall be identified in the safety analysis report,	Consider not limiting the items important to safety addressed in the SAR.	Y			
FR022	03.008 -	The safety functions, associated safety limits and main items important to safety22 shall be identified in the safety analysis report., which shall also provide ~~details of the emergency arrangements for the facility and~~ details about the operating organization, the conduct of operations and the management system throughout the nuclear fuel cycle facility life. The safety case provides details of the emergency arrangements for the facility.	According to member states, the emergency arrangements are described either in the safety analysis report or in another piece of the safety case.	Y			

DE007	03.008 Footnote No. 22	"See (Ref. ~~[2]~~ [9]) for definitions."	<2> Wrong reference is given in the footnote. Definitions of the terms 'safety function', 'safety limits' and 'items important to safety' are not provided in GSR Part 3 but in the Safety Glossary.	Y			
EN027	03.011 -	The operating organization shall submit the licensing documentation to the regulatory body in support of its application for authorization of the facility ~~and periodically thereafter~~. A schedule for the submission of documents for review and assessment for the stages in the authorization process shall be agreed between the regulatory body and operating organization ~~at an early date in a new nuclear fuel cycle facility project.~~	A resubmission of licensing documentation without reason during the lifetime is not known, also not by GSR Part 1 – a resubmission or amendment might happen only, when a licence is renewed or amended. Additionally periodic safety review is considered in Req. 5. The time of contact with the regulatory body is not worth to be regulated.	Y	Paras 3.11 and 3.12 have been reworded, "early stage" retained.		
USA07	03.012	After the 1st sentence, add: "Typically, the operating organizations submit a letter of intent and the regulator and operator conduct pre-application meetings in a transparent fashion, well before an application for authorization is submitted." This review and assessment of the …	Regulatory agencies may need to plan and budget extra resources for major regulatory activities and actions. Early and frequent communications allow all parties to reach a common ground and understanding of the information needed by the regulator to assemble findings and issues required in a transparent manner to support decision-making.	Y	The operating organization shall give adequate notice to the regulatory body of its intent to move from one stage to another in the lifetime of the facility. Decisions on the need for authorization shall be documented by the regulatory body, which shall assess the licensing documentation prior to giving an authorization. Moved to para 3.11.		
CA004	03.012 -	The regulatory body shall base subsequent authorization for stages in the lifetime23 of the facility on relevant objectives, principles and associated criteria for safety to ensure that the facility presents no undue ~~radiological~~ risks to the personnel at the site, the public and the environment, and taking account of potential security threats…	3.12 should not limit the risks under consideration to radiological risks.	Y	Paras 3.11 and 3.12 have been reworded.		
EN028	03.012 -	This review and assessment of the licensing documentation shall be carried out prior to authorization ~~and repeated over the lifetime~~ of the facility.	See reason 3.11	Y	Paras 3.11 and 3.12 have been reworded.		

USB08	03.013	Replace “acceptance criteria” with the term “performance requirements.” Change the title to “Performance and prescriptive requirements.” Revise 3.13 as follows: “3.13 States shall develop their own approach to establishing requirements depending on their particular legal and regulatory infrastructure. These may be prescriptive or based on performance. Acceptance criteria that ensure compliance with the requirements shall be considered. The Annex to this publication provides an example of how likelihood and consequence performance requirements for minimizing accident risk may be developed.”	The use of the term “acceptance criteria” in this section is confusing. And so is the example provided in the Annex. The risk matrix provided in the Annex is a representation of performance requirements and not acceptance criteria. Even though it is extremely important to establish acceptance criteria against which a safety case could be developed and reviewed, it may not rise to the level of being a requirement. As an example, for ALARA, acceptance criteria may be for an operator to commit to (1) establishing an ALARA program and organization, (2) preparing ALARA policy and procedures, (3) establishing an ALARA Committee, etc.	Y			
RU011	03.013 -	“States shall develop their own approach to safety acceptance criteria depending upon their particular legal and regulatory infrastructures”.The title of sub-section should be changed accordingly.	Criteria related to safety are to be the subject for consideration.	Y	Now "criteria for judging safety" to align with Requirement 16 of GSR part 4.		
FR023	03.013 - + Annex	~~The Annex to this publication provides a diagram which explains the relationship between likelihood and consequence which could be used for accidental situations~~	Consider deletion of annex: this diagram is not an “acceptability diagram” but one (and only one) entry point for analysis that would lead to establishment of acceptance criteria. Moreover ALARA/ALARP remains relevant.			Y	Annex was revised to address comments from several MS. It adds value to the reader and it is suggested it be kept.

EN029	03.017 -	If there is evidence of non-compliance or risks are identified, including risks unforeseen in the authorization process, enforcement actions as stated in para 4.55 of [4] shall be taken. ~~a deterioration in the level of safety, or in the event of serious violations which in the judgement of the regulatory body could pose an imminent radiological, chemical or industrial hazard to the workers, the public or the environment, the regulatory body shall require the operating organization to curtail its activities and to take any further actions necessary to restore an adequate level of safety. In the event of continual, persistent or extremely serious non-compliance, the regulatory body shall direct the operating organization to curtail its activities and may suspend or revoke the authorization.~~	Text should be in line with and as close as possible to GSR Part 1 Req. 30 and 31, and especially para 4.55 ("Enforcement actions by the regulatory body may include recorded verbal notification, written notification, imposition of additional regulatory requirements and conditions, written warnings, penalties and, ultimately, revocation of the authorization. Regulatory enforcement may also entail prosecution, especially in cases where the authorized party does not cooperate satisfactorily in the remediation or resolution of the non-compliance.")	Y			
EN030	04.001 Requirement 2:	**The operating organization shall have the prime responsibility for the safety of the nuclear fuel cycle facility over its lifetime, from the beginning of the project for site evaluation, design, construction, through to commissioning, operation~~, utilization modification~~ and decommissioning.**	Modification can take place at any stage of the lifetime and should not be stated separately.			Y	Utilization and modification have important safety implications. Their use needs to be kept consistent with Requirements for NPPs and Research Reactors.
USA08	04.002	(a) Clearly define responsibilities and accountabilities with corresponding lines of authority and communication, ensuring organizational independence of safety and operations functions;	In the organizational structure, usually groups responsible for safety overview are independent from groups responsible for operations. "Independent" means neither group reports to the other in an administrative sense.The independence of safety groups allows them to achieve safety objectives and facilitate proper audit, review, and control of safety functions.	Y			

FR025	04.002 -	In order to ensure rigor and thoroughness by all levels of the staff in achieving and maintaining safety, the operating organization shall: (a) Clearly define responsibilities and accountabilities with corresponding lines of authority and communication; (b) Be committed to promoting and achieving a strong safety culture on the basis of a statement of safety policy and safety objectives which is prepared and disseminated and is understood by all staff; (c) Ensure that it has sufficient qualified staff with appropriate experience at all levels for all activities that may affect safety; (d) Develop and strictly adhere to sound procedures for all activities that may affect safety, ensuring that managers and supervisors promote and support good safety practices while correcting poor safety practices; (e) Review, monitor and audit all safety related matters on a regular basis, implementing appropriate corrective actions where necessary; (f) Allocate adequate financial resources to ensure safety including provision for decommissioning.	Safety culture " *the assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, protection and safety issues receive the attention warranted by their significance* " must be listed prior to the other bullets, which are parts of it.			Y	This suggestion is one of several interpretations of priority that are possible. We have aligned this sequence with the corresponding list in otherstandards for nuclear installations for consistency.
EN032	04.003 -	Delete 4.3. to 4.5	This has nothing to do with Req. 1 (Responsibility for safety), but with licensing process and enforcement. Content is already included in para 3.11. and 3.12, especially in GRS Part 1 para 4.34ff and also very detailed in DS 473 (FUNCTIONS AND PROCESSES OF THE REGULATORY BODY FOR SAFETY). Information requested in 4.4 is excessive and should be limited to safety related information.	Y	Reference to "assessment by the regulatory body" has been removed from paragraph 4.3. The scope of para 4.4 has been restricted to safety documentation. Para 4.5 has been deleted as suggested.		

FR026	04.004 -	The format and content of documents submitted to the regulatory body by the operating organization in support of the authorization shall be ~~based on~~ consistent with the requirements presented in this publication.	The format and content of documents submitted to the regulatory body by the operating organization in support of the authorization are based on the specific requirements of the member states regulatory bodies.	Y			
FR024	04.006 Requirement 3	The operating organization shall establish and implement safety, health and environmental policies. that give **protection and** safety the highest priority	See AIEA definition of "safety culture" Without the word "protection", it sounds as if safety has priority on environment protection while safety contributes to environment protection.	Y			
DE008	04.007 Footnote No. 24	" 'Senior management' means the person who, or group of people which, directs, controls and assesses an organization at the highest level (Ref. ~~[2]~~ [9]). …"	<2> Wrong reference is given in the footnote. The definition of the term 'senior management' is not provided in GSR Part 3 but in the Safety Glossary.	Y			
DE009	04.010 Footnote No. 25	"… This system integrates all elements of management including safety, health, environ-mental, security, quality, societal and economic elements so that safety is not compromised."	<2> Ensuring consistency with Requirement 7 and Para 1.3 of the Draft Safety Requirements DS456 "Leadership and Management for Safety" (future GSR Part 2; latest draft version dated 16 June 2015). Societal elements, such as communication with the public and other interested parties, should also be considered in the integrated management system.	Y			
DE010	04.014 -	2nd bullet: "Any requirements formally agreed with ~~stakeholders~~ interested parties;"	<2> The current IAEA Safety Standards and drafts in the development / revision process use the term 'interested parties' instead of 'stakeholders'.	Y			

DE011	04.014 -	3rd bullet: “All the relevant IAEA Safety Requirements publications, including those established by this publication and those on emergency preparedness and response (Ref. [7]), ~~and~~ safety assessment (Ref. ~~[3]~~ [12]), predisposal waste management (Ref. [3]) and decommissioning (Ref. [8]).”	<2> Wrong reference is given in this bullet. General requirements on safety assessment are established in GSR Part 4 (Rev. 1). There is no reason to leave out the General Safety Requirements GSR Part 5 and GSR Part 6 for the back end of the nuclear fuel cycle.			Y	This particular reference to the IAEA requirements is now less specific, not more specific.
EN033	04.014 -	The integrated management system shall identify and include the following requirements: - The relevant statutory and regulatory requirements of the Member State; ~~- Any requirements formally agreed with stakeholders;~~ ~~- All the relevant IAEA Safety Requirements publications, including those established by this publication and those on emergency preparedness and response Ref. [7] and safety assessment Ref~~. [3].	Only relevant requirements need to be respected in the management system. Not relevant. IAEA Safety requirements are not binding for licensees and need to be deleted here.	Y	"Relevant" inserted and reference to the safety standards toned down.		
SE002	04.014, page 19	Consider rephrasing	IAEA Safety Requirements are not directly introduced in the IMS of the facility. However, they may very well be implemented through the regulations submitted by the regulatory body of the Member State (e.g. SSM). These regulations can include IAEA Safety Requirements. Hence, IAEA Safety Requirements publications cannot be included in the IMS of the facility unless all requirements have been transferred and introduced in the regulations submitted by the regulatory body of the Member State	Y	Reference to the IAEA safety requirements has been replaced by a more general reference to the IAEA safety standards.		
EN034	04.015 -	The documentation of the integrated management system shall be reviewed and approved at appropriate levels of management in the operating organization and shall be submitted to the regulatory body for review and assessment ~~as~~ if required by national requirements.	Depends on Member State regulation.			Y	The Management System is important to safety and shall be subject to regulatory review.

EN035	04.017 -	Management shall seek independent advice and as required regulatory ~~agreement~~ permission before major decisions affecting safety.	Regulation of MS lay down, when regulatory agreement is needed.	Y	Inserted "if required" and changed word order. Differences in usage of words "permission" and "agreement" may vary between Member States, as neither is defined in the IAEA glossary.		
SE003	04.018(b), page 19		To require all suppliers of items important to safety to have an integrated management system in place is desired but not realistic at the moment	Y	Removed "integrated".		
EN036	04.021 -	The processes shall allow the operating organization to ensure that the fabrication and construction of items important to safety are performed in accordance with the design basis ~~intents~~ and regulatory requirements.	The term “design intent” is not known.			Y	The phrase "design intent" means the "intention of the design" and was used twice in the previous version of NS-R-5 also in SSG-38, GS-G 3.5, TecDocs and in several IAEA safety standards relevant to other types of facility.
DE012	04.025 Footnote No. 26	“See footnote ~~17~~ 19 for the definition of audits.”	<2> Wrong reference is given in the footnote.	Y	Footnote referred to para 4.2 with relocated footnote.		
EN038	04.026 -	~~The safety assessment process shall be undertaken by individuals or groups independent from those who originally carried out the design work. The management system shall include provision for ensuring the quality of the design of each structure, system and component, as well as of the overall design of the nuclear fuel cycle facility, at all times. This includes the means for identifying and correcting design deficiencies, for checking the adequacy of the design and for controlling design changes~~.	Not correct. The designer may have more information and insights and may be qualified for safety assessments. Deletion because content already included in paras regarding management system (Req. 4)	Y	Removal of repetitive text -agreed. Independence - not agreed		

RU014	04.026 -	~~The safety assessment process shall be undertaken by individuals or groups independent from those who originally carried out the design work.~~	It is unjustified to put as an obligation the requirement to undertake safety assessment independently ‘"from those who originally carried out the design works”. This requirement should be considered as an expression of will to perform assessment once again independently from the designers, whose obligations include implementation of safety assessment.			Y	This represents the basic requirement for independent review to ensure quality.
EN037	04.026 Requirement 5:	**The ~~performance~~ safety of the facility or activity in all plant states shall be assessed in the safety analysis and independently reviewed.**	For clarification.	Y			
EN039	04.028 -	…. The operating organization shall verify by analysis, surveillance, testing and inspection that the physical state of the facility is as described in the safety analysis report and other safety documents, including any ~~approved~~ modifications, -	The SAR shall be updated as necessary with the current description of the facility whatever approved/ non approved were the modifications	Y			
FR027	04.029 -	The periodic safety review shall confirm that the safety analysis report and other documents (such as documentation for operational limits and conditions, maintenance and training) ~~for the facility~~ remain valid in view of current regulatory requirements; or, if necessary, it shall propose improvements.		Y			
EN040	04.030 -	4.30. The findings of safety assessments and periodic safety reviews shall be considered by the safety committee (see 4.31)	Safety committee is not introduced before	Y	This paragraph has been moved to Requirement 6, where this clarification is unecessary.		
FR028	04.030 -	4.30. The findings of safety assessments and periodic safety reviews shall be considered by the safety committee (or an advisory group), see 4.31)	Safety committee is not introduced before	Y	This paragraph has been moved to Requirement 6, where these clarifications are unecessary.		

SE004	04.030, 4.35, pages 22- 24	Sections 4.30 - 4.35 should be expressed in a more flexible way	Depending on type of facility, country-specific regulations, size of company, organization etc. the safety committees may vary substantially. Also, there are important safety committees, e.g. chaired by the president of the facility, that cannot be independent as required in section 4.31	Y	Improved clarity of of scope of several paragraphs and added footnote.		
EN041	04.031 -	The operating organization shall establish one or more internal safety committees to advise the management of the operating organization on safety issues related to the commissioning, operation and modification of the facility. Such committees shall have among their membership the necessary breadth of knowledge and experience to provide appropriate advice. The members of the safety committee shall be to the extent practicable be independent of the management of operation ~~The committee shall be independent of the regulatory body and its membership shall, to the extent necessary, be independent of the operations management raising the s~~afety matter.	The idea here is only related to internal safety committee			Y	
FR029	04.031 -	The committee shall be independent of the regulatory body and its membership shall, to the extent necessary, be independent of the operations management ~~raising the safety matter~~.	The goal of the safety committee is not only to give advice on subjects raised by operations management but also to identify issues by his own!	Y			
RU038	04.031 Requirement 6	"'Safety department for a nuclear fuel cycle facility''.We suggest to delete the requirement concerned with the establishment of such committee with deliberative authority. In return, we suggest to provide requirement regarding establishment of a special-purpose subdivision (Safety department) within the frames of the operating organization to exercise mostly the same functions, As a result we propose to change the main text accordingly and to re-locate this section to the section dedicated to operation.	This requirement is excessive; it is not necessary as compared with the proposed one.			Y	We agree that many facilities should have a specialised safety department, but the safety committee is different.

EN042	04.033 -	The list of items that the safety committee is required to review shall also be established. Such a list shall include, ~~as a minimum~~, for example the following items:	The list is too large to be sais “as a minimum”.	Y	deleted "as a minimum"		
FR030	04.033 -	(c) Proposed modifications (temporary or permanent) to processes, equipment or systems **or structures** that may have significance for safety;	Consider addressing all the SSCs.	Y			
FI001	04.034 -	Before the safety committee is established the operating organization shall establish appropriate management systems to ensure relevant aspects of the facility design, changes to the design, operating procedures, organization and safety assessment are subject to an appropriate level of review by the safety committee.	Add: Organization. The organization changes can have safety impact that should be analyzed (in line with GS-R-3 and DS456].	Y			
RU015	05.001 -	The main safety objective in site evaluation for a nuclear fuel cycle facility is to identify and assess site characteristics affecting or potentially affecting its safety».	The main safety objective presented in evaluating the site for a nuclear fuel cycle facility is a common safety objective to all lifecycle stages. As long as this Section includes safety requirements to the particular stage (site selection/evaluation), it is suggested to formulate the objective taking Into account the specific features of this stage.	Y	The main safety objective in evaluating the site for a nuclear fuel cycle facility is the protection of the public and the protection of the environment against the radiological and chemical hazards arising from normal and accidental releases of radioactive material (see NS-R-3 [6]). This requires the identification and assessment of site characteristics affecting, or potentially affecting, the facility and the effects that the facility has, or may have, on its surroundings.		
EN043	05.001 - 05.013 to	Delete Chap. 5 Site Evaluation for Nuclear Fuel Cycle Facilitiestogether with paras. 5.1 to 5.13	For site evaluation there is NS-R-3 and DS 433 which is addressed in para. 1. Additional explanations are not necessary. This becomes yet clear since there’s not a single requirement in chapter 5.			Y	The structure was approved by Committees after intensive discussions on this point.
SE005	05.001 section 5 p24-27	It should be clarified that the first part (Site evaluation) only deals with new sites	The Section consists of two parts, i.e. Site Evaluation and Ongoing Site Evaluation	Y	The first part has been clarified, so that it covers both. A new sub-section heading has been added and Section 1 changed to clarify the requirements that are specifically for new facilities.		

FR031	05.002 -	(c) The population density and population distribution and other characteristics of the external zone in so far as they may affect the possibility of implementing emergency response actions ~~and the need to evaluate the risks to individuals and the population~~;	It is always required to evaluate the risks to the population.			Y	To be kept for the benefit of the readers.
AM005	05.002 - a	(a) The possible effects of external hazards applicable to region of a particular site (these hazards could be of natural origin or human induced);	Though the statement in §5.2(a) is consistent with NS-R-3 document, it is still questionable whether "external event" term could be used. It seems that term "external hazard" is more correct in this context since the statement relates to hazard evaluation which potentially could lead to event.			Y	The wording is consistent with NS-R3.
AM006	05.002 - e	It is proposed to delete "~~(e) The presence of other nuclear or chemical facilities on or near the same site~~"	The presence of other nuclear or chemical facilities is type of human induced external hazards that are already covered in the paragraph 5.2(a).	Y	Scope of (a) increased to include events on the site, explicitly.		
FR032	05.004 -	The evaluation shall be graded so the amount of detail required for facilities where the ~~unmitigated hazard is~~ risks are low (e.g. a natural uranium fuel fabrication facility) can be substantially reduced below that required for a medium (e.g. light water reactor fuel manufacture) or high risk facility (e.g. reprocessing facility).	"Unmitigated hazard" is quite unclear. The evaluation could be graded to the level of risks induced by the facility.	Y			
FR033	05.004 -	Consider adding a bullet requiring the definition of the radiological and chemical initial state of the site, before the implementation of the new facility.	This is initial state is necessary to assess the real impact of ta new facility on a new or existing site.	Y	Added to para 5.10 in the revised draft.		
FR034	05.005 -	The site evaluation includes an analysis of the effect of normal operation of the facility on people and the environment around the site. ~~If events of lesser severity but higher probability make a significant contribution to the overall risk, they shall also be considered in the design of the nuclear fuel cycle facility.~~	The second sentence is related to the design of the facility and the chapter 5 is devoted to the site evaluation. More than that, the comparison (lesser severity or higher probability) is unclear for normal operation conditions.	Y	Clarified to refer to design acceptance criteria for the as-built or the proposed design of the facility.		

PK002	05.005 -	The text, ‘‘The site evaluation includes an analysis of the effect of normal operation of the facility on people and the environment around the site." may be replaced with,“The site evaluation includes an analysis of the effect of normal operation of the facility and accident conditions on people and the environment around the site.”	The objective of site evaluation also includes effects of accident conditions on population, as described by Para 5.9.	Y			
CA005	05.009 -	5.9. In relation to the characteristics and distribution of the population, the combined effects of the site and the installation shall be such that:(a) For operational states of the facility the ~~radiological~~ exposure of the population to radiological and toxic hazards remains as low as reasonably achievable and in any case is in compliance with national requirements, with account taken of international recommendations; (b) The ~~radiologic~~al risk to the population associated with accident conditions, including those that could lead to emergency response actions being taken, is acceptably low.	5.9 should not limit the risks under consideration to radiological risks.	Y	We use "associated toxic hazards" to avoid (re)defining standards for non-nuclear safety.		
CA006	05.011 -	5.11. When a new nuclear fuel cycle facility is planned, in or near to urban or suburban environment, the suitability of the site to accommodate a nuclear installation shall be carefully analysed to avoid unacceptable ~~radiological~~ risk to site personnel and public.	5.11 should not limit the risks under consideration to radiological risks.	Y			
USB11	06.001	Delete last two sentences; ~~This is one of the principal means of avoiding cliff edge effects in nuclear fuel cycle facilities. Unless inherently safe , the systems that provide these functions are not intended as primary systems for normal control.~~	This is not a requirement	Y	Simplified and reworded as requirement		
USB12	06.001	Rephrase last sentence as follows: “Unless approved by the regulatory body, active systems relied on to ensure main safety functions shall not be used to conduct normal operation.”	The purpose of this requirement is to not use (challenge) active safety systems to control normal operations. However, there may be special circumstances where this is needed.	Y			

USB13	06.001	Add a new sub-requirement (6.1) to address the conduct of a hazards analysis as follows: “A hazards analysis shall be conducted to identify all credible design basis events and their associated initiating events that could challenge or fail the main safety functions and result in unacceptable consequences.”	Reactors tend to have a standard or similar set of design basis events and initiating events. Fuel cycle facilities are different with many unique design basis events. Therefore, for each facility, a specific hazards analysis is needed to identify all potential credible accident sequences and their corresponding initiating events.	Y			
EN044	06.001 -	These main safety functions address the principles in Ref. [1] and specific requirements in Ref. [2]. By use of defence in depth, the facility shall be designed to operate normally in a manner that does not challenge these main safety functions. ~~This is one of the principal means of avoiding cliff edge32 effects in nuclear fuel cycle facilities. Unless inherently safe33, the systems that provide these functions are not intended as primary systems for normal control.~~	The main safety functions have to be always applied! Also systems or features for normal operation are needed and used to ensure the main safety function. Furthermore it is fully implied in Req. 10	Y	Simplified and reworded as requirement		
FR035	06.001 -	Requirement 7: Main safety functions The design shall ensure the fulfilment of the following main safety functions for all plant states of the nuclear fuel cycle facility, the loss of which may lead to significant radiological or chemical consequences to the workers, the public or the environment: (a) Maintaining the sub-criticality of fissile material; (b) Confining radioactive and associated harmful materials; (c) Cooling radioactive materials; (d) Pro**tecting** workers, peo**ple and env**ironment ~~against~~ external radiation.	Consider distinguishing “cooling” and “confining”. Cooling could be also necessary to ensure prevention of criticality accident. Workers and environment have also to be protected against ionizing radiations. Not only external exposure shall be addressed, but also internal exposure.	Y	"protection against radiation exposure"		
FR036	06.001 -	*This is one of the principal means of avoiding cliff edge32 effects in nuclear fuel cycle facilities .*	Clarify or delete!!	Y	Simplified and reworded as requirement		
FR037	06.001 -	Unless inherently safe33, the systems that provide these functions are not intended as primary systems for normal control**, as far as practicable**	For most FCFs, the level of independence between the systems that provide the safety functions and the systems for normal control is not as stringent than for nuclear reactors	Y	Agree not always physically possible to provide independence. Referred to regulator instead.		

JP005	06.001 footnote 32	Please consider of adding the following description to the footnote 32 or “NOTE ON DEFINITIONS” if it is appropriate to describe the “cliff edge effect” of a nuclear fuel cycle facility.“The system and the characteristics in nuclear fuel cycle facilities of “cliff edge effect” are quite different from ones in NPPs. Here are some examples of cliff edge effect for nuclear fuel cycle facilities; ・Boiling or evaporation to dryness of highly active liquid waste ・4 vol% of hydrogen in a vessel ・Leak or evaporation of water in the spe nt fuel pool”	Clarification for “cliff edge effect” is required for better understanding of readers. - The “cliff edge effect” described in Safety Glossary is defined for reactors but not for nuclear fuel cycle facilities. - Since the system and the mechanism in nuclear fuel cycle facilities are quite different from reactors, it is quite difficult to understand what will be the “cliff edge effect” for nuclear fuel cycle facility.	Y	Clarified main text and added examples to footnote.		
USB10	06.001 Requirement 7(b)	Delete “Cooling and” since it is one of the means for providing confinement. Under (a) change “Maintaining the…” to “Maintaining…”	If cooling is identified then so should ventilation, valves, hot cells, etc.			Y	The items listed are SSC, not functions. There is no alternative to the provision of cooling where it is needed. That is why so many cooling systems are passive.
EN045	06.002	Confinement can depend on the cooling of ~~some nuclear~~ radioactive materials where a loss of cooling could eventually result in the dispersion of radioactive materials. Confinement shall prevent any unplanned release of ~~nuclear~~ radioactive materials with radioactive or hazardous chemical properties. Planned releases of ~~nuclear~~ radioactive materials shall be controlled to be kept within authorized limits and shall be as low as reasonably achievable. Any accidental releases shall be limited. Secondary safety functions associated with confinement include the integrity of items important to safety, removal of decay heat (cooling) and prevention of adverse consequences of radiolysis (e.g. accumulation of hydrogen radiolysis).	Example: HLW solutions Clarity Clarity	Y	Inserted text slightly shorter.		

FR038	06.002 -	Confinement can depend on the cooling of some nuclear materials ~~where a loss of cooling could eventually result in the dispersion of radioactive material~~.	The second part of the sentence seems to be obvious.	Y			
FR039	06.002 -	Confinement shall prevent any unplanned release of ~~nuclear~~ materials with radioactive or hazardous chemical properties.	The release of UF6 is in fact the release of a radioactive compound of uranium (UO2F2) and the release of an hazardous chemical product (HF). Both have to be contained.	Y	The proposed wording appears to prohibit the release of excluded material and Radon - changed unplanned to unintended.		
FR040	06.002 -	Secondary safety functions associated with confinement include the integrity of items important to safety, ~~removal of decay heat~~ and prevention of the adverse consequences of radiolysis.	Removal of decay heat is one of the main safety functions.	Y			
FR041	06.003 -	Sub-criticality shall be ensured for all facilities handling fissile materials above certain limits. However facilities which handle natural (unenriched) uranium and certain other materials, as defined by national regulations, **could** be considered deterministically safe against a criticality accident.	It should not be a requirement.	Y	*Para 6.4 now reads;* Sub-criticality shall be ensured for all facilities handling fissile material (see Requirement 38). It is often impracticable to provide shielding for protection against an excursion or a shutdown system provided for criticality in a fuel cycle facility, and so emphasis shall be placed on prevention of excursions leading to criticality.		
JP006	06.004/3	the main safety functions for all plant states ~~of the facility~~.	Making the description consistent with "Note on Definitions".	Y			
JP007	06.005/2	for all plant states ~~of the facility~~.	Making the description consistent with "Note on Definitions".	Y			

USA09	06.006	At the beginning of Para 6.6, add the following: The design of a facility as well as radiation protection management and control shall provide for adequate protection of workers and the public from radiation and associated hazards both during normal operations and during emergencies." Acceptable limits...	Completeness. Need to emphasize in Para 6.6, that the physical design, the radiation protection control and management, as well as workers qualification and training are key factors in achieving compliance with dose limits, especially during accidents, which by definition are uncontrolled	Y	Reworded to align with the intent of the proposed text.		
EN046	06.006 Requirement 8	Delete Requirement 8 together with paras. 6.6 to 6.7.	Text should be identical to GSR Part 3, see para 3.5.			Y	This wording is almost identical to R8 in SSR2/1 and very similar to R8 in SSR3, both of which have CSS approval.
FR042	06.006 Requirement 8	Requirement 8: Radiation protection for a nuclear fuel cycle facility The design of a nuclear fuel cycle facility shall ensure that radiation doses to workers and other personnel at the facility and to members of the public do not exceed the dose limits, and that total doses are kept as low as reasonably achievable in operational states for the entire lifetime of the facility, and that they remain below acceptable limits and as low as reasonably achievable during, and following, accident conditions.	Consider defining what total doses are.	Y			
DE013	06.007 Footnote No. 35	"See footnote ~~13~~ 15."	<2> Wrong reference is given in the footnote. The term 'practically eliminated' is defined in footnote 15.	Y	Footnotes moved		

FR014	06.007and 02.013(4)	Consider deletion of practical elimination concept	The wording “practically eliminated” is not usual for fuel cycle facility and not easily understandable. Indeed, the accident kinetic is often very fast (fire, UF6 releases) even for accident that should be considered in the safety demonstration. It is difficult to understand how an accident with fast kinetic – thus early releases – should be: - On the one hand, considered and its consequences mitigated, - On the other hand, practically eliminated. **This concept should be explained or it should be removed**			Y	This was discussed and agreed at NUSSC in June 2015.
EN047	06.008 -	~~Adequate information on the design shall be provided for ensuring the safe operation, utilization, maintenance and decommissioning of the nuclear fuel cycle facility, and to allow subsequent modifications and new operating regimes to be implemented.~~	Unclear. Clarify or delete			Y	The same requirement appears in SSR2/1 and SSR3, approved by CSS.
EN048	06.008 Requirement 9	The design of a nuclear fuel cycle facility shall ensure that the facility and items important to safety have the appropriate characteristics to ensure that the safety functions can be performed with the necessary reliability, that the facility can be operated safely within the operational limits and conditions for its entire lifetime and can be safely decommissioned, and that impacts on the environment are ~~minimized~~ as low as reasonably achievable.	See also Requirement 24 and 26.	Y			
USB14	06.010	Change “…accidents that do occur” to “…accidents in case they occur”		Y	This phrase was poorly worded and has been deleted.		

EN049	06.010 -	~~The design shall take due account of the results of deterministic safety analyses and as appropriate complementary probabilistic safety analyses to ensure that due consideration has been given to the prevention of accidents and to mitigation of the consequences of any accidents that do occur~~The design features, controls and arrangements necessary to implement the defence in depth concept shall be identified mainly by means of a deterministic analysis (which may be complemented by probabilistic studies) of the design and operational regime. The safety assessment shall be justified by the application of sound engineering practices, based on research and operational experience. The safety assessment shall be carried out during the design stage to ensure that safety and regulatory requirements can be met.	§6.22 is better than §6.10. The first should replace the second	Y	See revised text		
FR043	06.010 -	The design shall take due account of the results of deterministic safety analyses and as appropriate complementary probabilistic safety analyses to ensure that due consideration has been given to the prevention of accidents and to **the** mitigation of **their**consequences ~~of any accidents that do occur~~. The safety assessment shall be carried out during the design stage to ensure that safety and regulatory requirements can be met.	Wording.	Y			
EN050	06.012 -	Delete. This said in a better way in §6.66	§6.66 is simpler and clearer.	Y			
FR044	06.012 -	(1) ~~A postulated initiating event would produce no safety significant effects and would result in change towards a more safe and stable condition by means of inherent safety characteristics of the facility;~~	A postulated initiating event (PIE) is an event identified during the design as capable of leading to anticipated operational occurrences or accident conditions. How a PIE could lead to a safer or more stable state of the facility?	Y			

USB15	06.012(2)	by the action of systems that are operating continuously …" to "…by continuously available active safety systems or human action in…"	It is not clear what is meant by systems that are operating continuously.	Y	(1) Following a postulated initiating event, the facility would be rendered safe by means of passive safety features or by the action of systems that are continuously available or activated by an operator;		
USB16	06.013	Change "…~~design of automatic safety actions for the actuation~~…" to "design for automatic actuation…"	Editorial	Y	Changed to "design for automated safety actions" and deleted "for the actuation of safety systems".		
EN051	06.013 -	Where prompt and reliable action would be necessary in response to a postulated initiating event, provision shall be made in the design of automatic safety actions ~~for the actuation of safety systems~~, to prevent progression to more severe facility conditions	"Safety system" are not currently used in FCFs. For most FCFs, the level of independence between I&C used for safety and I&C used for normal operation is not as stringent than for nuclear reactors	Y	Changed to "design for automated safety actions" and deleted "for the actuation of safety systems".		
PK003	06.013 -	The text, "Where prompt and reliable action would be necessary in response to a postulated initiating event, provision shall be made in the design of automatic safety actions for the actuation of safety systems, to prevent progression to more severe FACILITY conditions." may be replaced with,"Where prompt and reliable action would be necessary in response to a postulated initiating event, provision shall be made in the design of automatic safety actions for the actuation of safety systems, to prevent progression to more severe	'Accident Condition' is more appropriate term as defined in IAEA glossary under the definition of 'Plant States'.	Y			
USB17	06.014	In the last sentence change "…~~diagnosis of the necessary recovery process~~" to "…diagnosis of the event and the necessary recovery process	The design should take into consideration the possibility of an operator making the wrong event diagnosis	Y			
EN052	06.014 -	An analysis shall be made for reliability of human action in this case ~~of the potential for an operator to worsen an event sequence through erroneous operation of equipment or incorrect diagnosis of the necessary recovery process~~.	For clarification and a more positive wording	Y	An analysis shall be made of human reliability in the operation of equipment, diagnosis of the event and the necessary recovery process.		

EN053	06.015 -	The operator actions necessary to diagnose the state of the nuclear fuel cycle facility following a postulated initiating event and to put it into a ~~stable long term shutdown~~ safe condition in a timely manner shall be facilitated, as needed, by the provision in the design of adequate instrumentation to monitor the status of the nuclear fuel cycle facility, and adequate means for the manual operation of equipment.	Shutdown applies only for very few facilities – term should be safe condition! There are facilities, that don't need instrumentation, e.g. storage facilities.	Y	"as necessary"		
FR045	06.015 -	The operator actions necessary to diagnose the state of the nuclear fuel cycle facility following a postulated initiating event and to put it into a stable ~~long term~~ shutdown condition in a timely manner shall be facilitated by the provision in the design of adequate instrumentation to monitor the status of the nuclear fuel cycle facility, and adequate means for the manual operation of equipment	Consider erasing the reference to "long term", in a section dealing with operational occurrences…	Y			
GB001	06.016 -	The design shall ensure that the generation of radioactive waste and discharges to the environment are kept to the minimum practicable in terms of both activity and volume, and that wastes are categorized and appropriately segregated.		Y	See Requirement 24		
RU016	06.016 -	"The design shall ensure that the generation of radioactive waste and discharges to the environment are kept to the minimum practicable in terms of both activity and volume, and that wastes are characterized and safely managed".Another option: to exclude this requirement from this Section and move it to the appropriate Section on RAW management.	The desired requirement is not complete; our proposal clearly complements it exhaustively.	Y	See Requirement 24		
USB18	06.018	Change "…provide several levels…" to "…provide the appropriate number of levels…"	At fuel cycle facilities all accidents do not need several levels of defense.	Y	Now para 6.19		
USB19	06.018	Change "…~~environment, ensure~~…" to "…environment, and ensure…"		Y	This sentence has been deleted from para (now 6.19) to make it more readable.		
USB20	06.018	Change "…described ~~below and~~ in Section 2" to "…described in Section 2"	The graded approach is not described below; only in Section 2	Y	This cross reference to paragraph (now 6.28) has been deleted.		
PK004	06.018 -	The text of this Para may please be rephrased.	Thu text of this Para is not self-explanatory but is rather confusing	Y	The paragraph (now 6.19) has been rephrased and made shorter.		

PK005	06.018 Requirement 10	Some discussion regarding emergency response facilities and emergency plans and procedures may please be included under Requirement 10.	Emergency response facilities and emergency plans and procedures are also part of defence in depth as per Para 2.13	Y	See new paras 6.25 - 6.26		
EN054	06.019 -	~~The design shall take due account of the fact that the existence of multiple levels of defence is not a basis for continued operation in the absence of one level of defence.~~ All levels of defence in depth shall be kept available at all times and any relaxations shall be justified for specific modes of operation including maintenance operations.	Second sentence includes first one – furthermore it is unclear what is meant by it (design shall take due account of the absence of one level?)	Y			
FR046	06.020 -	(a) Provide successive verifiable **levels** to:▪ **Prevent criticality accident,** ▪ Control release of radioactive material and associated hazardous chemicals to the environment; ▪ **To control exposure of workers, population and environmen**t**,** ▪ **If relevant, hea** t removal.	The defence in depth principle is applicable to maintain all the main safety objectives.	Y	Provided cross-reference to Requirement 7 for safety functions.		
EN055	06.020 - f	Provide ~~multiple~~ reliable ~~(diverse and independent, where possible)~~ means (e.g. by using the principle of redundancy, diversity~~e~~ and/or independency~~t, where possible~~)for ensuring that each of the main safety functions is performed, thereby ensuring the effectiveness of the barriers37 and mitigating the consequences of any failure or deviation from normal operation.	For clarification, that reliable means are needed, not multiple.	Y	The principle of Requirement 23 is referred to.		
USB21	06.020(a)	Change to "Provide for successive verifiable barriers to control the release	Editorial	Y	Whole paragraph reworded, with cross-reference to Requirement 7 for safety functions.		
USB24	06.020b Footnote 36 (now 31 ?)	Footnote 36 (now 31 ?). Provide reference for the phrase "cliff edge effects"	The reference to the note on definitions is confusing	Y	Explanation provided in the footnote.		
EN056	06.021 -	~~To ensure that the concept of defence in depth is maintained,~~ the design shall prevent, as far as is practicable:	This is not done to ensure DID, but to ensure the safety function of confinement.	Y			

USB22	06.022	Change first sentence to “The safety analysis shall identify the design features, controls and arrangements necessary to implement the defence in depth concept.”	It is not necessary to base the determination of design features and controls on a deterministic analysis which may be complemented by probabilistic studies.	Y	Concept deleted from this paragraph. Please see para 6.68 in the revised draft.		
USB23	06.022	Modify the beginning of the third sentence as follows: “The safety analysis shall incorporate application of sound engineering practices…”		Y	Comment accepted in full, but the change has been implemented in para 6.10 because 6.22 no longer exists.		
EN057	06.022 -	Delete 6.22	The proposal made before is to put the text in §6.10.	Y			
FR047	06.022 -	Delete 6.10 and keep 6.22	Repetition of 6.10.			Y	Deleted 6.22 and kept 6.10
EN058	06.023 -	The design shall be such as to ensure as far as practicable, that accidents ~~the first, or at most the second, level of defence is capable of preventing an escalation to accident conditions for all failures or deviations from normal operation that~~ are not likely to occur over the operating lifetime of the nuclear fuel cycle facility.	For clarification what is meant – likelihood of events.	Y			
CA007	06.024 -	6.24. Defence in depth shall be implemented by taking into account the graded approach as described in Section 2. The amount and type of radioactive and toxic material present, its potential for dispersion, the potential for nuclear, chemical or thermal reactions, and the kinetics of such events shall all be considered in determining the required number and strength of lines of defence.	This should be expanded to address non-radiological hazards. See comment 0.	Y			
EN059	06.025 -	The levels of defence in depth shall be independent as far as is practicable to avoid a failure of one level reducing the effectiveness of other levels. In normal operation items or procedures important to safety shall not routinely be activated or challenged or only challenged by a very wide safety margin, as far as reasonably practicable.	The addition is needed to follow wording of Req. 10.			Y	Feed back from the Fukushima Daichii accident underlines the importance of independence in the application of the defence in depth concept.

FR048	06.025 -	As far as required by the graded approach, the levels of defence in depth shall be independent to avoid a failure of one level reducing the effectiveness of other levels. In normal operation items or procedures important to safety shall not routinely be activated or challenged or only challenged by a very wide safety margin38	The required degree of independency differs according to the amount and type of radioactive materials, its potential for dispersion, the potential for nuclear, chemical or thermal reactions, and the kinetics.			Y	Feed back from the Fukushima Daichii accident underlines the importance of independence in the application of the defence in depth concept.
USB25	06.026	Add “documented” in front of “engineering judgement.	An appropriately documented basis is needed.	Y	This para (now 6.29) has been rewritten and documentation is required.		
USA10	06.026	Delete the term ~~“engineering judgment”~~ in this paragraph and throughout the entire document	The term “engineering judgment” is vague, ill-defined, and connotes different meanings to different people and contexts. Its use has no place within a general requirements document such as this. Simple deletion throughout the document is probably acceptable. A suitable replacement could be “operating experience” or “experience in the same or similar industries” in most cases.	Y	This paragraph (now 6.29) rewritten and refers simple to "judgement". "Expert judgement" replaces "engineering judgement" elsewhere in DS478.		
EN060	06.026 -	~~The use of a graded approach in the application of the safety requirements shall not be considered as a means of waiving requirements and shall not result in compromising safety. Grading of requirements shall be justified and supported by safety analysis or engineering judgement.~~	The deleted text questions the concept of graded approach.			Y	Paragraph (now 6.29) retained and reworded. Text inserted to highlight that graded approach is *necessary* for some fuel cycle facilities instead.
FR049	06.027 -	The available routes for the ~~disposal~~ release of effluents and the storage of radioactive waste;	wording	Y	"discharge of effluents"		
RU017	06.027 -	(d) “The strategy for radioactive waste management and available routes for the discharge of effluents”.	This formulation is more logical and precise.	Y			
USB26	06.028	Delete the second sentence	The requirement is confusing and open ended.	Y	Significantly simplified.		

RU018	06.028 -	~~The personnelmakinggrading judgements shall be suitably qualified and experienced. Great care is needed to avoid the loss of significant safety measures such as passive safety and features provided for defence in depth.~~	This requirement is not necessary in view of its obviousness; it takes the form of a recommendation.	Y	Experts making judgements on grading that could have a significant impact on safety shall be suitably qualified and experienced.		
SE007	06.028 Req 12	Add “to the extent possible” (or similar)				Y	The wording is identical to SSR2/1 and SSR3, whach were accepted by CSS.
FR050	06.029 -	Items important to safety shall preferably be of a design that has previously been proven in equivalent applications39. ~~**If not**~~ **In any case**, items shall be of high quality and of a technology that has been qualified and tested	Even if their design has been previously proven, items important to safety shall be of high quality.	Y			
EN061	06.031 -	~~Codes and standards applicable to items important to safety shall be identified and their use shall be in accordance with their classification (see Requirement 14). In particular, if different codes and standards are used for different types of items (e.g. for piping and for electrical systems), consistency between the codes and standards shall be demonstrated.~~	Redundant with 6.54	Y			
FR051	06.031 -	In particular, if different codes and standards are used for different types of items (e.g. for piping and for electrical systems), consistency between the codes and standards shall be demonstrated, as far as necessary.	Precision	Y	This para deleted.		
DE014	06.033 -	Note to the 1st sentence: The reference to Footnote No. 40 is misleading and has to be deleted.	<2> Footnote 40 deals with the safety classification of items important to safety. This information does not fit to the content of the first sentence of Para 6.33.	Y	Reference corrected to 32.		
EN062	06.034 -	For the design of items important to safety, acceptance criteria in the form of engineering design rules may be used. These rules may include requirements in relevant codes and standards established in the State or internationally. ~~The acceptance criteria shall be provided to the regulatory body for review, Ref. [4].~~	The review by the regulatory body of the whole of the acceptance criteria is not practicable	Y	Restricted scope of this requirement to "for significant items important to safety"		

EN064	06.036 -	The method for classifying40 the safety significance of items important to safety shall be based primarily on deterministic methods complemented, where appropriate, by probabilistic methods (if available), with due account taken of factors such as:(a) The safety function(s) to be performed by the item; (b) The consequences of failure to perform a safety function; ~~(c) The frequency with which the item will be called upon to perform a safety funct~~ion; (d) The time following a postulated initiating event at which, or the period for which, the item will be called upon to perform a safety function	The frequency is not a pertinent criterion as some items important to safety can be only called upon very rarely; nevertheless they require a high classification level.	Y			
FR053	06.036 -	The method for classifying40 the safety significance of items important to safety shall be based primarily on deterministic methods complemented, where appropriate, by probabilistic methods (if available), with due account taken of factors such as:(a) The safety function(s) to be performed by the item; (b) The consequences of failure to perform a safety function; ~~(c) The frequency with which the item will be called upon to perform a safety funct~~ion; (d) The time following a postulated initiating event at which, or the period for which, the item will be called upon to perform a safety function	The frequency is not a pertinent criterion as some items important to safety can be only called upon very rarely; nevertheless they require a high classification level.	Y			
FR052	06.036 Requirement 14	Requirement 14: Safety classification of items **important to safety**	wording	Y			
RU019	06.039 -	Items and software for instrumentation and control that are important to safety shall ~~be first identified~~ and then classified according to their function and significance for safety.	The requirement regarding identification of equipment is not clear.	Y			
USB27	06.042	Change "…acceptable in all plant states" to "sufficiently low in all plant states"	Most member countries do not specify what an acceptable level of risk is.	Y			

FR054	06.042 -	The goal of the safety assessment shall be to demonstrate that the risks to the **workers, public and environment** from the radioactive materials and chemicals in the facility are acceptable in all plant states, when account is taken of the capabilities of the facility and the safety of operations.	Consider adding the environment.	Y	Also added "associated" to "chemicals"		
AM007	06.043 -	All foreseeable hazards and correlations/ combinations of hazards shall be examined systematically and in combinations with plant conditions41 and human activities, to identify all sources of potential radioactive or associated hazardous chemicals.	Lessons learned from Fukushima accident show that safety assessment should also cover possible combinations and/or correlations of hazards. Currently there are a lot of activities in this field aimed to develop complementary analysis techniques (screening tools) that could assist to address this issue. One of the examples could be Fault Sequence Analysis method developed and benchmarked by the IAEA after Fukushima accident. The mentioned change is in line with the Requirement 17 of the same document.	Y	All foreseeable hazards and correlated events shall be examined systematically and in combinations with facility conditions…		
FR055	06.043 -	All foreseeable hazards shall be examined systematically and in combinations with plant conditions41 and human activities, to identify all sources of potential radioactive or associated hazardous chemicals. Internal industrial hazards that could interfere with safe operation of the facility shall be identified~~. Internal and external hazards shall be identified that could affect multiple facilities on the same site~~.	Consider adding a section 6.47 to insert this requirement and make the transition to the next part devoted to external hazards.	Y			
CA008	06.044 -	6.44. All credible failures of safety function and human error that could result in a hazardous event shall be examined for all operating conditions of the facility, including shutdown. All non-radiological hazards, e.g. industrial and chemical hazards that may lead to ~~radiological~~ unacceptable consequences shall be taken into account.	6.42 explicitly includes public risk from hazardous chemicals but 6.44 excludes it.	Y	"..that may affect facility safety and lead to unacceptable radiological or chemical consequences shall be taken into account."		

FR056	06.044 -	All credible failures of safety function and human error that could result in a hazardous event shall be examined for all operating conditions of the facility, including shutdown. All non-radiological hazards, e.g. industrial and chemical hazards that **may impact the facility and lead to radiological or chemical** consequences shall be taken into account.	Wording. Consider adding the chemical consequences	Y	"..that may affect facility safety and lead to unacceptable radiological or chemical consequences shall be taken into account."		
USB28	06.045	In the first sentence, add “and explosions” before “fire”	Explosions are also important at certain fuel cycle facilities	Y			
CA009	06.045 -	6.45. The potential for internal hazards such as fire, flooding, missile generation, pipe whip, jet impact, corrosion, erosion, vibration, thermal or pressure cycling or the release of fluid from failed systems or from other installations on the site shall be taken into account in the design of the facility, see Appendix. Appropriate preventive and mitigation measures shall be taken to ensure that ~~nuclear~~ safety is not compromised. Some external events could initiate also internal fires or floods or lead to the generation of missiles. Such interrelation or interaction of external events with internal hazards shall also be considered in the design where appropriate.	6.42 explicitly includes public risk from hazardous chemicals. 6.45 excludes it.	Y			
FR057	06.045 -	Some external events could initiate also internal fires or floods or lead to the generation of missiles. Such interrelation or interaction of external events with internal hazards shall also be considered in the design where appropriate.	This sentence is related to external event, subject of the following sections.	Y	First sentence moved to Requirement 17.		
FR058	06.049 -	The need for the nuclear fuel **cycle** facility	wording	Y	Also improved wording of second sentence in this para.		
FR059	06.052 -	The design shall provide for ~~an~~ adequate **margins** to protect items important to safety against levels of external hazards more severe than those selected for the design basis taking into account the site hazard evaluation.	Wording This requirement is related to stress tests. It could be insert in a specific chapter devoted to Fukushima accident feedback.	Y	Wording changed but the structure of the document has not been altered.		
FR060	06.054 -	In particular, if different criteria, codes and standards are used for different aspects of the same item or system, consistency between them shall be demonstrated	Already written in 6.31. 6.54 seems to be the proper place	Y	6.31 deleted		

DE015	06.054 Footnote No. 42	“For instance, the designer may not design to the Class 1 section of the design code where Class 3 would fulfil the required safety objective. The designer also has some discretion in estimating loads for the classification of structures and components, and hence in the selection of codes.”	<1> Does the first sentence refer to the classification of SSCs according to the Safety Guide SSG-30 “Safety Classification of Structures, Systems and Components in Nuclear Power Plants” ? For clarification purposes, an appropriate reference should be inserted into the footnote. Although SSG-30 primarily applies to the design of SSCs important to safety in NPPs, it can also be applied to other nuclear installations subject to appropriate adjustments relevant to the specific design of the type of facility being considered (see Paras 1.6 to 1.9 of SSG-30).	Y	Footnote does not refer to SSG-30 and has been clarified as follows; For instance, the designer may not design to the Class 1 section of a design code where Class 3 would fulfil the required safety objective. The designer also has some discretion in estimating loads for the classification of items, and hence in the selection of methods, so that the 3-tier classification system used for NPP is inappropriate for facilities where the hazards are very small. See also Requirement 14 with footnote.		
FR061	06.059 -	Certain events might be consequences of other events, such as a flood following an earthquake. An external hazard, such as an earthquake, is able to cause multiple simultaneous events on a site and major releases of hazardous materials from various source locations. Credible consequential events shall be considered to be part of the initiating hazard. The safety analysis shall take into account such series of aggressions or the impact of one aggression on all the facilities located on the same site. ~~The safety analysis shall demonstrate the ability of the design to withstand combinations of abnormal operating occurrences.~~	To clarify how to take into account succession of hazards and impact on a whole site	Y	Inserted with "hazardous chemicals and radioactive materials from various….”		
FR062	06.059 -	The safety analysis shall demonstrate the ability of the design to withstand combinations of abnormal operating occurrences.	Consider creating a new section for this requirement which concerns the operation conditions.	Y	Moved to Requirement 9 "General Design Considerations".		
FR063	06.063 -	For each design basis accident, the consequences to the workers ~~personnel~~, the public and the environment shall be estimated	Wording	Y			

USA11	06.064	Modify 2nd sentence to read: “The analysis shall confirm that the risk of consequences from design basis accidents is acceptably low.”	The consequences of accidents are never acceptable. It's the low risk that we find acceptable.	Y			
JP008	06.065/3	~~Mobile~~ Non-permanent equipment that is important to safety shall be included in the analysis.	Making the description consistent with SSR-2/1 (Rev.1). If “mobile equipment” is the same meaning of “non-permanent equipment”, then “non-permanent equipment” used in SSR-2/1 (Rev. 1) should be used for para. 6.193 and 6.201.	Y			
FR064	06.066 -	(1) Process selection to eliminate inherent hazards; (2) Passive design features ~~controls~~; (3) Active design features~~ control~~s; (4) Administrative controls	wording	Y			
FR065	06.067 -	Within these requirements and the general framework of Section 2, the operating organization shall specify explicit acceptance criteria for the level of safety to be achieved. Targets shall be set on the radiological consequences and associated chemical consequences for the workers and the public, from direct and indirect exposures to radiation, authorized discharges and design basis accident situations. The targets shall be set below the levels set in national regulations, regulatory guidance, international and national standards to ensure compliance across the full range of facility conditions and throughputs.	The general safety objective is to reduce as far as possible the release of radioactive or chemical materials. Consider addressing targets or objectives and not limits. For existing facilities or new one, the objectives must be below the limits which could be defined in regulations.	Y	Inserted with additional text; "..consequences for the workers, the public and the environment, from .." and deleted final sentence of paragraph making the exception for new facilities.		
FR066	06.068 -	In setting targets related to accident conditions in the design basis, the aim is to decide if additional provisions in accordance with the defence in depth principle are necessary.	For operational states and design basis accident, the objective is to reduce the consequences as far as possible by the implementation of different provisions participating to the first three levels of the defence in depth. consider deletion of annex ‘see comment on 3.13	Y	The sentence describing the Annex has been replaced äs follows; "….linked to the frequency or probability of occurrence, see the Annex. Where consequences of accident conditions in the design basis exceed the set targets, additional provisions shall be made in accordance with the defence in depth principle."		

DE016	06.071 -	Last sentence: Footnote 11 has to be replaced by footnote 13.	<2> Wrong footnote is referred to in Para 6.71. The term ‘severe accident’ is defined in footnote 13.	Y	The term "severe accident" has been removed from this paragraph and the footnote now linked to Requirement 9.		
EN065	06.071 -	The main technical objective of considering the design extension conditions shall be to provide assurance that the design of the facility is such as to prevent accident conditions not considered as design basis accident conditions, or to mitigate their consequences, as far as is reasonably achievable. ...	missing word	Y			
FI004	06.071 -	Footnote 11 should be 13		Y	The term "severe accident" has been removed from this paragraph and the footnote now linked to Requirement 9.		
CA010	06.071 - 06.073 ,	Correct references to footnotes 11, 12, 13. Now 13, 14, 15.	Editorial	Y	The term "severe accident" has been removed from this paragraph and the footnote now linked to Requirement 9.		

FR067	06.071 - 06.075 Main Requirement 22 and text to	The design extension conditions shall be used to identify the additional accident scenarios to be addressed in the design and to plan practicable provisions for ~~the prevention of such accidents or~~ mitigation of their consequences **and emergency preparedness and response**.	"Design extension condition" is a concept that arises from reactor design. It is relevant to apply this approach to fuel cycle facilities in order to enhance safety but it should be adapted and explained. **Regarding that, 6.71 to 6.75 are not understandable** and their deletion should be considered and a **complementary IAEA guidance should be developed.** For example, DEC for reactor are clearly divided in two types: accidents more complex than the set of DBA (generally named multiple failures) and severe accident. Then DEC is both for prevention of SA (level 3 of DiD) and mitigation of SA (level 4 of DiD). It should be explained how to apply such an approach to fuel cycle facilities - with less complex functional aspect but more complex phenomena (chemical ones for example); - whose objectives could focus on confinement and workers protections; - whose accidents kinetic could be very fast regarding confinement consequences. For these installations, if the extended accident scenario is prevented, it is control of a design basis accident.			Y	DEC is a new concept and we agree that supporting guidance will be needed. However, it is better to include something in DS478 that to omit DEC altogether. DEC is not a type of accident but a challenged / degraded plant status. If a DEC is avoided in a reactor, it would probably be a DBA as it would be in a fuel cycle facility.
AM008	06.073 -	The facility shall be designed so that the possibility of conditions that could lead to early releases, or to large releases14, is practically eliminated15.	There are wrong references to the footnotes describing "large releases" and "practically eliminated" terms.	Y			

DE017	06.073 -	1st sentence: Footnotes 12 and 13 have to be replaced by footnotes 14 and 15, respectively.	<2> Wrong footnotes are referred to in Para 6.73. The terms ‘early / large releases’ and ‘practically eliminated’ are defined in footnotes 14 and 15.	Y			
FI005	06.073 -	Footnote 12 should be 14		Y			
FI006	06.073 -	Footnote 13 should be 15		Y			
FR069	06.076 -	A fire hazard analysis and an explosion hazard analysis shall be carried out for the nuclear fuel cycle facility to determine the necessary ratings of fire barriers and identify means of passive protection and appropriate physical separation against fires and explosions. Fires and explosions originating externally to the site and within the site shall be considered ~~using a graded approach~~.The analysis shall cover all means of fire prevention and control: (a) Fire prevention; (b) Fire detection; (c) Fire extinction; (d) Segregation and barriers to prevent the spread of fire and smoke; (e) Escape of personnel.	The graded approach is applied function to the level of risks not in function of the hazard origin. External fires and explosions have to be studied and, if necessary, dispositions have to be implemented and these features have to be commensurate to the risks. Consider creating a new section for these means dedicated to fire control. Consider creating a similar section, to define dispositions dealing with explosion hazard: (a) Explosion prevention; (b) Explosive gaz detection; (c) ventilation for dilution; (d) Inerting of vesssels and glove boxes; (e) …	Y			
RU020	06.076 -	The analysis shall cover all means of fire and explosion prevention and fire control: (a) Fire prevention; fb) Runaway reactions prevention:	Explosion hazards are to be taken into account.	Y			
FR068	06.076 Requirement 23	The potential for external and internal fires and explosion**s** shall be analyzed and **related** potential initiating events shall be identified for the safety analysis. Specific controls required for fire**s** and explosions shall be identified clearly.	**postulated initiating event:** An event identified during design as capable of leading to anticipated operational occurrences or accident conditions.	Y			

CA011	06.077	The fire and explosion hazard analyses shall consider both fires involving nuclear material and fires affecting nuclear material explicitly. The analyses shall demonstrate that a single event cannot prevent a safe shutdown or result in an uncontrolled release of radioactive or other hazardous material from the facility.	This should be expanded to address non-radiological hazards. See comment 0.	Y	With "associated" not "other"		
FR070	06.078 -	and would not simultaneously affect redundant safety groups and thereby render ineffective the measures taken to comply with the **single failure criterion**.	Consider reminding definition “single failure criterion” in a foot note: A criterion (or requirement) applied to a system such that it must be capable of performing its task in the presence of any single failure.	Y	Cross-reference provided to Requirement 25		
EN063	06.079 Requirement 24	Delete	”Requirement 24 is a copy/paste” of Requirement 9	Y			
FR071	06.079 Requirement 24	Delete	”Requirement 24 is a “cut & paste” of Requirement 9	Y			
USA12	06.081	Re-phrase or delete examples 1, 3, and 5 in the footnote.	The footnote to 6.81 provides 5 examples. Three examples (1, 3, and 5) are not clear and contain undefined technical jargon. Those examples should either be clarified or replaced.	Y	Footnote reworded.		
FR072	06.081 -	Items important to safety shall be designed to withstand the effects of extreme loadings and environmental conditions (e.g. extremes of temperature, humidity, pressure, radiation levels) arising in operational states and in relevant design basis accident ~~**(or equivalent)**~~ conditions48.	Equivalent conditions to design basis accident are not defined and this wording is too abstracted. Footnote 48: this note is defining some effects of extreme loadings. It would be preferable to give examples of extreme loadings	Y	Footnote reworded and "or equivalent" deleted		
FR073	06.093 -	The principles of **diversity and separation** shall be considered in the design of the facility to enhance reliability of items important to safety and to reduce the potential for common cause failures.	Wording	Y	Word-order changed, "segregation" changed to "separation".		

RU021	06.094 - ,	“Waste processing and storage shall be provided in accordance with pre- established criteria and the national waste strategy, and shall take into consideration both on-site and off-site storage capacity and disposal options”.	The possibility of radioactive waste storage off-site should also be taken into consideration.	Y			
RU033	06.094 Requirement 26	Features to provide radioactive waste management	The design shall envisage engineering means/measures on radioactive waste management, but not only the features to facilitate this management.	Y	The incorporation of provisions for radioactive waste management at the nuclear fuel cycle facility shall be considered at the design stage. The generation of radioactive waste shall be kept to the minimum practicable in terms of both activity and volume, by means of appropriate design measures. The predisposal management and disposal routes for waste shall be considered with the ... aim of minimizing the overall impact on the public and the environment.		
JP009	06.097/2	to be produced during the ~~life cycle~~ lifetime of the facility	Amendment for the better wording	Y			
EN066	06.099 -	Systems and facilities shall be provided for the safe management of radioactive waste ~~on the nuclear fuel cycle facility site~~ to enable radioactive waste characterization, segregation, encapsulation, and interim storage that cover the current and future inventory of radioactive waste.	Not necessary.	Y	Para deleted		
RU022	06.099 -	Systems and facilities shall be provided for the safe management of radioactive waste on the nuclear fuel cycle facility site to enable radioactive waste characterization, segregation, treatment and conditioning (if any) ~~encapsulation.~~ and interim storage	The term ‘‘encapsulation'- is incomprehensible in such application.	Y	Para deleted		
EN068	06.102 -	Nuclear fuel cycle facilities shall be designed to ~~minimise~~ optimize the impact of radioactive ~~and toxic~~ effluents from normal operations on the public and the environment.	To be in line with GSR Part 3 and with the scope.	Y	"….shall be designed to optimize the impact of radioactive and associated toxic effluents … "		

EN067	06.102 Requirement 27	Design provisions shall be established for ensuring that discharges of gaseous, liquid and particulate radioactive materials ~~and associated hazardous chemicals~~ to the environment comply with authorized limits and to reduce doses to the public and effects on the environment to levels that are as low as reasonably achievable.	Out of scope			Y	The key word is "associated"
FR074	06.102 Requirement 27	Requirement 27: Design for the management of **gaseous** and liquid radioactive dischargesDesign provisions shall be established for ensuring that discharges of gaseous, liquid and particulate radioactive materials and associated hazardous chemicals to the environment **are reduced to levels that are as low as reasonably achievable and comply with authorized limit**s	Wording Consider pointing out first the ALARA principle and in a second time the respect of limits			Y	Smokes and aerosols are not gaseous
RU034	06.102 Requirement 27	Design for the management of gaseous and liquid radioactive discharges To be applied throughout the main text.	The uniformity of terminology'.			Y	Smokes and aerosols are not gaseous
EN069	06.103 -	These provisions shall account for ~~any~~ hazardous chemicals associated to radioactive materials and particulate matter that is present or potentially present.	See above.	Y			
FR075	06.103 -	Systems shall be provided for the treatment of gaseous and liquid radioactive effluents to keep their volumes and the amount of radioactivity as low as reasonably achievable and below the authorized limits for discharges.	See comment 64	Y			
IN001	06.103 Requirement 27, Chapter 6, page no. 46	System shall be provided for the treatment of gaseous and liquid radioactive effluents to keep their volumes, radioactivity, concentrations and the amount of radioactivity below the authorized limits of discharges. These provisions shall account for any hazardous chemicals and particulate matter that is present or potentially present..	Radioactivity concentrations of effluents also should be kept below the authorized limits of discharges.	Y			
GB002	06.104 -	Add ion exchange to filtration	It does not appear necessary to include an exhaustive list of treatment techniques in the context of the paragraph, which gives filtration as an example.	Y			

EN070	06.105 -	Where radioactive or hazardous ~~toxic~~ material may leak or bypass a filter, the design shall accommodate the testing (in accordance with accepted international standards) of removal efficiencies for final stages of cleaning (filters, scrubbers or beds) to ensure that they correspond to the removal efficiency used in the design.	Precision	Y			
FR076	06.106 -	The safety assessment shall determine the need for real time measurements to confirm that cleaning systems are working effectively and **that the discharges are continuously measured.** Design provisions shall be established for monitoring **gaseous** and liquid radioactive discharges to the environment.	wording	Y	The intent of this change is agreed, except for use of word "gaseous" because smokes and aerosols are not gaseous. Now says "discharges are measured continuously" to avoid splitting the verb.		
EN071	06.107 -	The design and layout of items important to safety shall include provision to ~~minimize~~ optimize exposures arising from maintenance, inspection and testing activities.	To be in line with GSR Part 3	Y			
FR077	06.107 -	The design and layout of items important to safety shall include provision**s** to minimize exposures arising from maintenance, inspection and testing activities. The term maintenance includes both preventive and corrective actions.		Y			
FR078	06.109 Requirement 29	Requirement 29: Ergonomics, human and organizational factors**Human and organizational factors and human–machine interfaces shall be considered throughout the design process**.	Consider addressing the general issue: human and organizational factors (see 6.112)	Y	Accepted with slight editorial change		
FR079	06.111 -	The design shall minimize the demands on operators in normal operations, in anticipated operational occurrences and in accident conditions, by considering provision of the following; (1) Automating appropriate actions to promote the success of the operation; (2) Providing clear indications whenever significant changes of process state occur; (3) Appropriate interlocks, keys, passwords and other control devices; ~~**(4) Barriers preventing accidental contact between operators and hazardous m**~~aterials.	Bullet 4 is not related to human and organizational factors or to human-machine interfaces. It is a requirement for hazardous material containment or radiation protection.	Y			

FR080	06.113 Requireement 30	**Direction and delivery of nuclear and associated hazardous materials** **The direction and delivery** of materials shall be considered in the safety analysis and the severity of any errors determined. The design shall provide features to ensure the correct **delivery** of nuclear materials and chemicals.	Consider replacing direction and delivery by transfer.	Y	**R30: Control over the transfer of radioactive material and hazardous material** The transfer of radioactive material and hazardous material shall be considered in the safety analysis and the necessary controls shall be identified. The design shall provide features to ensure the safe transfer of radioactive material and associated chemicals.		
RU035	06.113 Requirement	Management of nuclear and associated hazardous materials. The management of materials shall be considered in the safety ~~analysis and the severity of any errors determined~~.	Management is a more common term.	Y	**R30: Control over the transfer of radioactive material and hazardous material** The transfer of radioactive material and hazardous material shall be considered in the safety analysis and the necessary controls shall be identified. The design shall provide features to ensure the safe transfer of radioactive material and associated chemicals.		
EN072	06.113 Requirement 30	**Direction and delivery of nuclear ~~and associated hazardous~~ materials** The direction and delivery of materials shall be considered in the safety analysis and the severity of any errors determined. The design shall provide features to ensure the correct delivery of radioactive n~~uclear~~ materials and associated hazardous chemicals.	Precisions	Y	**R30: Control over the transfer of radioactive material and hazardous material** The transfer of radioactive material and hazardous material shall be considered in the safety analysis and the necessary controls shall be identified. The design shall provide features to ensure the safe transfer of radioactive material and associated chemicals.		

RU036	06.115 Requirement 31	~~In the design stage~~ Design safety margins shall be adopted so as to accommodate the anticipated properties of structures, systems and components that are important to safety to allow for the effects of materials ageing and degradation processes.	The design limits shall be established in respect to safety-relevant building structures, systems and components, but not in respect to materials, with the aim to prevent their sudden failure.	Y	Design safety margins shall be adopted so as to accommodate the anticipated properties of items important to safety, to allow for the effects of materials ageing and degradation processes. Text of 6.115 also clarified.		
FR081	06.117 Requirement 32	Requirement 32: Design for emergency preparedness The nuclear fuel cycle facility shall include specific features to facilitate emergency preparedness and the necessary emergency response facilities **shall be present** on the site where accidents could have significant off-site consequences.	wording	Y	Nuclear fuel cycle facilities are categorised in Table 1 of GSR part 7. **R47: Design for emergency preparedness and response** The design of a nuclear fuel cycle facility shall include adequate provisions to enable prompt response to an emergency. Such provisions shall include alarms, escape routes and means for monitoring, communication and accounting for personnel.		
JP010	06.119/4	Means of communication shall be available in the control room and also in ~~the supplementary control room~~ emergency response facilities if there is one.	There are no needs to install "Supplementary control room" in fuel cycle facilities, and only "control rooms and panels" are required in design stated in requirement 49.	Y	With minor editorial changes and without "if there is one".		
USA13	06.122	Delete "…conditions of vibration…".	This term is used as an example of environmental factors but it is a condition of loading or operation and not an environmental factor.	Y			
FR082	06.123 -	Items essential to the maintenance of criticality safety and items used to lift spent fuel and breeder elements in pools shall be appropriately qualified.	Consider erasing this section. These items have to be appropriately qualified as all the others.	Y	Moved to footnote as examples.		
EN073	06.125 Requirement 36	Delete together with para 6.125.	Included in GSR Part 6.			Y	There is an equivalent Requirement in SSR3 and SSR2/1 merges this requirement with one on radioactive waste

FI002	06.130 -	An appropriate number of complementary static physical barriers and dynamic containment systems shall be provided as determined by the safety analysis:removal of (a) The static containment system shall consist of physical barriers between radioactive material and workers or the environment. The number of physical barriers shall be determined on a case by case basis as determined by a safety analysis.	The Standard DS478 also applies to the interim storages, which may not be surrounded by a containment. The term "static containment" is confusing, if it actually means appropriate physical barriers	Y			
FR083	06.130 -	Containment shall be the primary method for confinement against the spreading of contamination, ensuring that it is as low as reasonably achievable and kept within limits and for keeping levels of airborne contamination~~.~~	First ALARA and after respect of the limits. Consider defining the origin of these limits: licensee, regulation…	Y			
FR084	06.130 -	(b) The dynamic containment system shall be used to create airflow towards areas with higher levels of contamination for treatment before discharge54. ~~The static containment shall be designed such that its effectiveness is maintained as far as achievable in case of loss of dynamic confinement.~~	Usually, the dynamic containment system is implemented to compensate failures of the static containment system and not the opposite.	Y	The sentence was not deleted but the order of "static" and "dynamic" was corrected.		
SE008	06.131, Page 52	Section 6.131 needs to be revised	Requirement for two static barriers may be adequate for MOX fuel fabrication and, reprocessing facilities. However, for U02 fuel fabrication facilities the requirement should be one static barrier (in most cases).	Y	6.127. The ingestion of a small quantity of some radioactive substances can result in a significant exposure. In facilities where such substances are handled in mobile form (e.g. in MOx fuel fabrication or reprocessing facilities), at least two static barriers shall be provided, so that radioactive material is confined inside the first static barrier during normal operations.		
FI003	06.133 -	In the design of dynamic containment systems, account shall be taken of the performance criteria for ventilation and static confinement ~~containment~~, including the pressure difference between zones, the types of filter to be used, the differential pressure across filters and the appropriate flow velocity for operational states.		Y			

FR085	06.135 Requirement 39	Provision shall be made for ensuring that doses to operating personnel at the facility **will be kept as low as reasonably achievable taking into account the relevant dose constraints, and below the dose limits**.	First ALARA with the dose constraints and then respect of the limits.	Y	With minor editorial change		
FR086	06.136 -	The design of the facility shall optimize human occupancy, the layout of equipment and radioactive materials, and shielding equipment to ensure radiation **exposures are maintained as low as reasonably achievable and kept within limits, in all operational states.**	See comment 77	Y			
JP011	06.141 - e	Stationary equipment for monitoring and controlling effluents prior to or during their discharge or release to the environment;	Clarification.	Y			
FR087	06.144 Requirement 41	The design shall ensure adequate sub-criticality control with sufficient safety margins, under ~~normal~~ operational states and ~~conditions that are referred to as credible abnormal conditions, or conditions included in the~~ design basis accidents.	Wording Operational states and design basis accident are clearly defined in the IAEA safety glossary. Criticality prevention must be also ensured within design basis accident conditions.	Y	", or design basis accident conditions.		
PK006	06.144 Requirement 41	Some discussion regarding exemptions from requirements of criticality safely may please be included under Requirement 41.	Exemptions are very briefly addressed in Para 6.3. These are required to be addressed in details under discussion of Requirement 41.	Y			
FR088	06.151 -	Consider adding a bullet :(a) Definition of the fissile reference medium, the most reactive radioactive and chemical form of the fissile materials involved, in normal or accidental conditions ;	The first issue for the criticality analysis is to define the material characteristics which could be met during normal or accidental conditions. Sometimes, in abnormal conditions, the fissile materials could be under a more reactive chemical form (e.g. UF6).	Y			
FR089	06.151 -	(c) Geometry: the analysis shall include the layout of the facility, and the dimensions of pipes, vessels and other process units. The potential for changes in dimensions during **operational states and accidental conditions** shall be considered.		Y			

AM004	06.151 - i	Uncertainties in all parameters (e.g. mass, density and geometry) as well as in applied cross-section libraries shall be considered in the criticality calculations.		Y			
FR090	06.159 -	6.159. The safety of the design for a MOX fuel fabrication facility shall be achieved by keeping one or more of the following parameters of the system within subcritical limits under normal operational states and conditions that, in accordance with national regulations, are referred to as credible abnormal conditions, or conditions included in the design basis: (a) PuO2 (input): (i) Mass and geometry in accordance with the safety specification of PuO2 isotopic composition and moderation; (ii) Presence of appropriate neutron absorbers. (b) UO2 (input): mass and geometry in accordance with the safety specification of UO2 isotopic composition and moderation. (c) MOX powder: MOX powder is formed in the fuel fabrication process, and the associated criticality hazard shall be assessed in accordance with the isotopic specification and the PuO2 content at each stage of the p**rocess.** **(d) MOX pellets: pellets are produced in the fuel fabrication process, and the associated criticality hazard shall be assessed taking into account the increase of density of fissile material.** **(e) MOX rods and assemblies: rods and assemblies are manufactured and the associated criticality hazard.** **Mass, geometry, moderation and neutron poisoning** could be considered.	Consider not focusing on the first stages of the process. All the control modes could be used for the criticality control.	Y			

FR091	06.163 -	A reference composition for the fissile material (reference fissile medium) shall be defined. The criticality safety assessment performed using such a reference shall be a conservative bounding case for the actual composition of the fissile material being handled or processed, e.g. **on the basis of the isotopic composition of Uranium and Plutonium, the Pu content and the moderation.** ~~It shall be ensured by means of the assessment that processes are conducted within the operational limits and conditions.~~	See comment n° 80. This reference fissile medium has to be defined also taking into account abnormal and accidental conditions.	Y			
DE018	06.166 -	"The loss of power is covered by Requirement~~s~~ 51 ~~and 52~~."	<2> Requirement 52 deals with the design of compressed air systems.	Y	loss of electrical and compressed air services for cooling systems is covered by Requirements 51 and 52		
USA14	06.168	Add at the end of Item (d): "..waste treatment and limit the exposure of pyrophoric materials to air."	Uranium and plutonium in finely divided form are pyrophoric and ignite spontaneously when exposed to air. This is a hazard during cutting and milling operations that need to be addressed	Y	Added "...and prevent the exposure of pyrophoric materials to air".		
JP012	06.168 - a	Limit the storage of hazardous materials in areas (e.g. volume, concentration) where nuclear material is handled;	Proposing to add some examples for the better understanding of readers.	Y			
EN074	06.169 -	~~The capacity, availability and reliability of these systems and controls shall be analysed and justified in the safety analysis report.~~	Is part of Requirement 42.	Y			
FR092	06.170 Requirement 44	Design measures for **controlling** fire and explosions **Facility** shall be designed and **equipment** located, so as to prevent fires and explosions and to minimize their effects	Not only prevention is addressed in this section -Wording	Y	**Requirement 44: Design measures for the control of fire and prevention of explosions …..**		
RU037	06.170 Requirement 44	"The facility shall be designed, so as to prevent fires and explosions and to minimize their effects".	The design measures for preventing fire and explosions should not be limited by the corresponding designing and placement of equipment.	Y			

FR093	06.171 -	Internal fires and explosions shall not challenge redundant ~~trains of safety systems~~ **safety groups**. Firefighting systems shall be automatically initiated as necessary.	Trains of safety system" is NPP wording Safety group is defined in the IAEA safety glossary. Consider creating a new section for this recommendation: the subject is different.	Y			
DE019	06.172 -	Note: The reference to Footnote No. 62 is misleading and has to be deleted.	<2> Footnote 62 deals with non-permanent equipment. This information does not fit to the content of Para 6.172.	Y	Should be 49		
USA15	06.173	At the end of Para 6.173 add: "In addition, the use of lube oil should be minimized, especially where it could come into contact with reactive chemicals such as UF6. Less flammable lubricants should be used whenever possible."	Some very bad fires have been caused by the ignition of lube oil.	Y	shall not should be limited		
PK007	06.174 -	The text, ''These shall be maintained by means of the appropriate incorporation of redundant structures, systems and components, diverse systems. PHYSICAL SEPARATION .and design for fail-safe operation." may please be replaced with,"These shall be maintained by means of the appropriate incorporation of redundant structures, systems and components, diverse systems and design for fail-safe operation."	'Physical Separation' is part of the term 'Redundant', so needs not to be mentioned separately.	Y	Corresponding changes to Requirement 25 also made.		
EN075	06.176 Requirement 45	Delete together with para 6.176.	Outside the scope.			Y	Added "associated with radioactive material" throughout
JP013	06.177 - Requirement 46p 61	Instrumentation and control systems shall be provided for controlling ~~the values of~~ all of the ~~main system variables~~ process parameters that are necessary for safe operation in all operational states.	Making the wording consistent with para. 6.179.	Y			

PK008	06.177 Requirement 46	The text, “Instrumentation and control systems shall be provided for controlling the values of all the main system variables that are necessary for safe operation in all operational states." may be replaced with, “Instrumentation and control systems shall be provided for MONITORING AND controlling the values of all the main system variables that are necessary for safe operation in all operational states."	Purpose of l&C important to safety is both monitoring and control.	Y	Instrumentation and control systems shall be provided for monitoring and control of all the process parameters that are necessary for safe operation in all operational states. Instrumentation shall provide for bringing the system to a safe state and for monitoring of accident conditions. The reliability, redundancy and diversity required of instrumentation and control systems shall be determined by the safety analysis...		
PK009	06.177 Requirement 46	The text, “The reliability, SEPARATION and diversity required of l&C systems shall be based on the safety analysis for the system." may be replaced with,“The reliability, REDUNDANCY and diversity required of l&C systems shall be based on the safety analysis for the system."	The term ’Redundancy’ includes both ’Physical Separation’ and ’Electrical Isolation’, so is more appropriate to be used here.	Y			
USA16	06.177 Requirement 46	Change “…~~based on the safety analysis~~…” to “…determined by the safety analysis…”	It is important to clearly articulate that the safety analysis determines the requirements for reliability, separation, and diversity	Y			
FR094	06.181 -	Radiation detectors (gamma and/or neutron detectors), with audible and where necessary visible alarms for initiating immediate evacuation from the affected area, shall cover all the areas where significant quantities of fissile material **are** present, **unless a safety demonstration establish that no reasonably foreseeable set of circumstances can initiate a criticality accident, or an excessive radiation dose to personnel is not credible.**	Wording The exceptions are not depending only to national regulations. First the safety case has to demonstrate that there is no need of a criticality accident detection and alarm system.	Y	Princple agreed, sentence restructured for clarity.		
FR095	06.182 -	Hot cells, glove-boxes and hoods shall be equipped with instrumentation and control systems for fulfilling the requirements ~~for a negative pressure~~ related to their static and dynamic containment.		Y	Yes, with "confinement" instead of "containment".		

FR096	06.183	In facilities handling and processing uranium hexafluoride (UF6); - Before heating a UF6 cylinder, the weight of UF6 shall be measured and shall be confirmed to be below the fill limit (e.g. by using a second independent weighing scale). - During heating a UF6 cylinder, the temperature shall be measured by means of two independent systems. - Where there is a potential to heat a UF6 cylinder to a temperature above that of the UF6 triple point, the temperature and the pressure of gas have to be controlled.	Weighing a UF6 cylinder has to be done in any case. Also during heating, temperature of the cylinder must be controlled. If liquefaction is performed, the pressure at the exit of the cylinder has to be controlled. Consider adding the following requirement written in NS-R5, III.29 In the event of an overfilled cylinder, UF6 in excess shall be transferred by sublimation only.	Y			
FR097	06.183 -	Consider adding a recommendation: At least two containment barriers around U6 under liquid form.		Y			
EN076	06.183 - first bullet	Add :In the event of an overfilled cylinder, UF6 in excess shall be transferred by sublimation only.	In NS-R-5 Specific Annex III – Operation §III.29	Y			
FR098	06.186 -	All I&C based items important to safety shall need to be designed and arranged so that their safety functions can be adequately inspected and tested, and the **systems** important to safety can be maintained, as appropriate, before commissioning and at suitable and regular intervals thereafter in accordance with their importance to safety. If it is not practicable to provide adequate testability of a component, the safety analysis shall take into account the possibility of undetected failures of such equipment.	Wording in coherency with the title.	Y			
FR099	06.187 Requirement 48	If a system is dependent upon computer based equipment, appropriate standards and practices for the development and testing of computer hardware and software shall be established and implemented throughout the service life of the system, and in particular throughout the software development cycle. The entire development shall be subject to a quality management system.	Idem Items belong to a system.	Y			

USA17	06.188 Requirement 49	Change "… ~~and in accordance with the safety assessment~~." to "…to satisfy the requirements resulting from the safety assessment."		Y			
SK001	06.200 - , after indent c	The design of the facility shall provide:6.200 (d) Possibility to feed the pool and to cool the inventory located into the pool by using a clean water (without soluble absorber) in the severe accident case.	For storage of spent fuel or another active material, in wet storage pools is necessary to apply the fourth level of defence in depth (see. section 2.13, paragraph (4)). Storage pools are filled and cooled by water containing dissolved absorber. Filling and cooling is provided by using primary pumps (primary heat sink) and back-up pumps (alternate heat sink), with water from storage tanks. In the case of a severe accident may be both primary and back-up pump dysfunctional, or they may spend all accessible water containing dissolved absorber (in the case leakage of pool, or pipes). In this extreme case we need to get any water to the pool to prevent the release of radioactive material into the environment, otherwise the release of radioactive material will be sooner or later caused by a residual heat, via thermal degradation of the inventory located in the pool. That is why there must be an opportunity to feed and to cool the pool even with clean water.	Y	6.200(d) Means to restore the coolant level. 6.201. The design of pools shall also include features to enable the safe use of non-permanent equipment to provide water for the long term cooling of spent fuel and to provide shielding against radiation[1].		
EN077	06.203 -	Should be 6.198. (e)	This is valid for any transfer	Y	Para 6.203 moved to follow 6.198.		
FR100	06.203 -	Should be 6.198. (e)	This is valid for any transfer	Y	Para 6.203 moved to follow 6.198.		
EN078	06.204 -	The design shall ensure samples are representative with preference given to techniques that ~~minimise~~ optimize occupational doses and minimise waste generation and provide results in a timely manner.	To be in line with GSR Part 3	Y			

FR101	06.204 -	**Equipment** for obtaining samples shall be designed **according** to ergonomic principles.	Wording	Y			
USA18	07.006	Replace the first sentence of Para 7.6 with: "As built" documents shall be retained with other information important to decommissioning until the site is released for unrestricted use.	Information important to decommissioning must be identified and retained as it is generated.	Y	The 'as built' documents (including information important to decommissioning and engineering drawings) shall be retained until the site is released for unrestricted use.		
EN082	08.001 Requirement 56	**Requirement 56: Commissioning programme The operating organization shall ensure that a commissioning programme for the nuclear fuel cycle facility is established and implemented. The programme shall be subjected to regulatory approval prior to its implementation according to national requirement**s	Depends on Member State regulation	Y	"...in accordance with..."		
GB003	08.003 -	The operating organization, designers and manufacturers shall be involved in the preparation and implementation of the commissioning programme. The commissioning process shall involve co-operation between the operating organization and the supplier(s)/constructor(s) to ensure an effective means for the operating organization to gain a good understanding of the characteristics of the facility.	This amendment provides more clarity than the current wording	Y	With minor editorial changes elsewhere in this sentence.		

FR102	08.013 -	The performance of criticality safety controls shall be confirmed at appropriate stages in the commissioning as follows; (a) Before hot commissioning: ・Demonstration of the availability of criticality detection and alarm systems; ・Demonstration of the performance of emergency shutdown systems. ・Emergency preparedness and response training, verification, validation and exercises (Ref. [7]). (b) During hot commissioning (and the early years of operation, as practicable): ・Verification of items which cannot be verified during cold commissioning, or which can be verified more effectively during hot commissioning than cold commissioning; ~~・Verification that actual external and internal doses to workers are consistent with the hypothesis and calculations performed during the design;~~ ~~・Verification that actual discharges are consistent with the calculated ones and the performance of discharge reduction and control systems~~.	The two last bullets are not related to criticality safety controls	Y	Paragraph structure and headings corrected, instead of deletion.		
FR103	08.018 -	The commissioning report, produced on conclusion of the commissioning, shall identify any updates required to the safety case and any changes made to safety measures or work practices as a result ~~of the results~~ of commissioning.	Wording	Y			
USA19	08.020	Plutonium or ‘hot processing’ commissioning requires major changes in personnel and equipment, containment, criticality, staff education and radiation control arrangements: ・For the workers, the behaviors and attitudes supporting a strong safety culture shall be enhanced so as to ensure safe operation with plutonium	Safety culture is enhanced by focusing on behaviors and attitudes. Safety culture is not tangible and therefore “safety culture” can’t be enhanced.	Y			

EN079	08.021 -	□ For the workers, the behaviors and attitudes supporting a strong safety culture shall be enhanced so as to ensure safe operation with plutonium □ Confirmation of the performance of shielding and confinement systems, including confirmation of the weld quality of the static containment; · Confirmation, where practicable, of the performance of criticality control measures; · Demonstration of the availability of criticality detection and alarm systems; · Demonstration of the performance of emergency shutdown systems · Demonstration of the availability of the emergency power supply · Demonstration of the availability ~~of any other~~ support systems necessary for the operation of items important for safety, e.g. compressed air supply and cooling.	Precision	Y			
FR104	08.022 - 08.023 8.21	**cold and hot commissioning**	The three requirements are not specific to reprocessing facilities. They have to be applied for all fuel cycle facilities, in a graded approach.	Y			
USA20	09.013	9.13. The operating organization shall be responsible for ensuring that the necessary knowledge, skills, behaviors and attitudes supporting a strong safety culture and safety expertise are sustained at the nuclear fuel cycle facility, and that long term objectives for human resources policy are developed and are met.	Focus should be on the behaviors and attitudes.	Y			
FR105	09.019 -	Periodic **retraining** in operational radiation protection shall be implemented.	Wording	Y			
CA012	09.021 -	9.21. The senior management shall be responsible for and shall make arrangements for all the activities associated with ~~nuclear~~ safety, including the handling of fissile material.	Requirement 59 relates to “safe operation of the plant”. 9.21 incorrectly reduces this scope to just nuclear safety.	Y			

DE020	09.023 -	1st sentence: “The operating personnel shall operate the facility in accordance with the approved operational limits and conditions and operating procedures (Requirements ~~61~~ 60 and ~~62~~ 66).”	<2> Wrong requirements are referred to in Para 9.23. Operational limits and con-ditions are addressed in Requirement 60, while operating procedures are addressed in Requirement 66.	Y			
EN080	09.024 -	Delete	FCF is not like a reactor. The first shut down mode is a for the process unit which face the technical issue	Y	*Para 9.19 now reads:* The operators shall have the authority to shut down parts of the facility in the interests of safety.		
FR106	09.024 -	All licensed or authorized operating personnel shall have the authority to shut down the nuclear fuel cycle facility **for safety issues**.	Wording	Y	*Para 9.19 now reads:* The operators shall have the authority to shut down parts of the facility in the interests of safety.		
FR107	09.026 -	All safety significant aspects of operation, maintenance, periodic testing, inspection, utilization and modification of the nuclear fuel cycle facility~~)~~ shall be carried out by authorised operating personnel (which may include personnel from external organizations).	Wording	Y	Deleted ")"		
EN081	09.029 -	For nuclear fuel cycle facilities where there is the potential for an accidental criticality the operating organization shall appoint qualified nuclear criticality safety staff who are knowledgeable about the physics of nuclear criticality and the associated safety standards, codes and best practices, and who are familiar with the facility design and operations.	Important	Y			
FR108	09.029 -	For nuclear fuel cycle facilities where there is the potential for an accidental criticality the operating organization shall appoint qualified nuclear criticality safety staff who are knowledgeable about the physics of nuclear criticality and the associated safety standards, codes and best practices, and who are familiar with the facility design and operations.	Important	Y			

EN083	09.033 Requirement 60	**Operational limits and conditions** ~~**The operating organization shall approve the set of operational limits and conditions derived from the safety analysis.**~~ **A set of operational limits and conditions shall be derived from the safety analysis by the operating organization and approved by the national safety authority. The operating organization shall ensure that the nuclear fuel cycle facility is operated in accordance with the set of operational limits and conditions**.	Self-standing. It's not the function of the operating organization to approve such limits.	Y	The operating organization shall derive operational limits and conditions from the safety analysis and submit them to the regulatory body for consideration.		
FR109	09.033 Requirement 60	**Operational limits and conditions The operating organization and the national regulatory body shall approve the set of operational limits and conditions derived from the safety analysis. The operating organization shall ensure that the nuclear fuel cycle facility is operated in accordance with the set of operational limits and conditions**.	Self-standing	Y	The operating organization shall derive operational limits and conditions from the safety analysis and submit them to the regulatory body for consideration.		
RU025	09.039 -	We propose to delete it.	It is inconsistent with the IAEA Safety Glossary. It is not a generally recognized approach.			Y	Text clarified viz.: *They can also be applied to situations that are not accident conditions; e.g. a lone operator handling fissile material is not an accident condition, but could be prevented by the limiting conditions for safe operation for the facility*
SE009	09.039 page 78	Rephrase so that limiting conditions apply to the most the most critical safety system settings	Instead of having general requirements for limiting conditions for all safety systems settings a graded approach should be applied for adequately selecting the most critical safety system settings	Y			

RU026	09.040 -	We propose to exclude this requirement or to move it to the appropriate Section.	It is not relevant to this Section.	Y	We agree that "procedures" do not belong here. Changed "procedures" to "conditions". Requirement 28 concerns design of controls for transfers, not operation, so this statement cannot be placed there.		
USA21	09.048	The training shall promote behavior and attitudes supporting a strong safety culture and shall emphasize the importance of safety in all aspects of the facility, including its design features, safety analysis, human and organizational factors, operational limits and conditions, operating procedures, radiation protection (including contamination control), criticality safety, emergency preparedness and response, and specific industrial safety hazards	Focus should be on the behaviors and attitudes.	Y	Additional text accepted, minor editorial changes elsewhere in paragraph.		
GB004	09.048 - Requirement 61 training, Para	The training shall promote safety culture and shall emphasize the importance of safety in all aspects of the facility, including its design features, safety analysis, human and organizational factors, operational limits and conditions, operating procedures, radiation protection (including contamination control), criticality safety, emergency preparedness and response, waste management and specific industrial safety hazards such as chemical and fire hazards. The scope of training on nuclear and non-nuclear hazards shall be commensurate to the hazard posed by the nuclear fuel cycle facility.	Reference to waste management implicitly includes waste minimisation, which is dealt with in other IAEA guidance and in paragraph 6.16.	Y	Additional text accepted, minor editorial changes elsewhere in paragraph.		
FR110	09.049 -	Specific training and drills for operating personnel, **internal and** external firefighters and rescue staff (emergency response) shall be provided relevant to their response to accident scenarios, including fire or explosion at the facility. The training and retraining programmes shall be conducted in accordance with potential hazards of the facilities and the processes.	Internal fire brigade has to be involved. Other accident scenarios then fire and explosion must be the subject of exercices.	Y	Additional text accepted, minor editorial changes elsewhere in paragraph.		
FR111	09.051 -	Training, training programmes **(including retraining),** training material and training outcomes shall be subject to review and audit in accordance with the established management programme.	To point out the importance of periodic retraining.	Y	Additional text accepted, sentence re-ordered.		

FR112	09.053 -	**Mixed oxide fuel fabrication facilities and reprocessing facilities**	This requirement has to be applied not only in MOX fuel manufacturing facilities. It is general when glove boxes are used.	Y			
EN084	09.053 - title before	**Mixed oxide fuel fabrication facilities and reprocessing facilities**	Add: gloves boxes are also used in reprocessing facilities	Y			
FR113	09.054 -	**Facilities processing UF6**	This requirement is also applicable to UO2 fuel manufacturing facilities.	Y			
CA014	09.056 -	9.56. All operational activities shall be assessed for the potential risks associated with harmful effects of ionizing radiation and toxic chemicals. The level of assessment and control shall depend on the safety significance of the task.	This should be expanded to address non-radiological hazards. See comment 0.	Y			
CA013	09.056 Req. 62	**Requirement 62: Carrying out safety related activities**The operating organization shall ensure that all safety related activities are adequately analysed and controlled to ensure that the risks associated with harmful effects of ionizing radiation and toxic chemicals are kept as low as reasonably achievable.	This should be expanded to address non-radiological hazards. See comment 0.	Y	**R59: Conduct of safety related activities** The operating organization shall ensure that all safety related activities are adequately analysed and controlled to ensure that the risks associated with ionizing radiation and associated chemical hazards are kept as low as reasonably achievable.		
EN085	09.058 Requirement 63	**The operating organization shall ensure that an effective ageing management programme is implemented to manage the ageing of items important to safety so that the required safety functions ~~of structures, systems and components~~ are fulfilled over the entire operating lifetime of the nuclear fuel cycle facility.**9.58. The ageing management programme shall determine the consequences of ageing and the activities necessary to maintain the operability and reliability of ~~structures, systems and components~~ items important to safety	Keep items important to safety or SSCs but not both.	Y			

RU027	09.059 - ,	~~Where details of the characteristics' of materials are unavailable, a~~ Where material properties and/or parameters relevant to the design of plant could change with time and affect safety suitable surveillance programme shall be implemented by the operating organization"'.	This approach is more general; it includes surveillance programs in respect to both the materials and equipment.	Y	Where details of the characteristics of materials (and corresponding items) ***are unavailable*** and could affect safety, a suitable material surveillance programme shall be implemented by the operating organization.		
EN086	09.061 -	~~(c) The relevant safety documentation (e.g. safety assessment report and operational limits and conditions) of the facility is followed;~~	Redundant with item (h)	Y	Item (c) relates to safety whilst performing the modification. Item (h) {now (f)} relates to the update of documentation following the modification, for its utilisation. Item (c) clarified.		
RU028	09.061 -	~~The operating organization shall have aspects of the preparation and performance of modifications. It may certain tasks to other organizations but in particular~~, the operating organization shall be responsible for the management of the proposed modification project, in which...	It is a repetition of requirement previously provided in text.	Y	Deleted the opening sentence of para 9.61. Also deleted 9.7g, which was repeated in 9.17		
EN087	09.062 - e	Delete	Unclear	Y	Merged with (c)		
EN088	09.062 - f	Combine 6.62 (f) with 9.62 (b):Safety analyses of the proposed modification are conducted; The management system is applied at all stages in the preparation and performance of the modification to ascertain whether all applicable safety requirements and criteria have been satisfied	Same idea	Y	9.62(b) replaced by 9.62(f)		

EN089	09.067 -	Delete the last sentence ~~Such information includes site data and environmental data, design specifications, details of the equipment and material supplied, as-built drawings, information on the cumulative effects of modifications, logbooks, operating and maintenance manuals and management system documents.~~ and replace with : The operating organization shall make arrangements for generating and controlling records and reports that have safety significance for the operation & decommissioning stages, including: (a) The complete collection of revisions to the licensing documentation; (b) Periodic safety reviews; (c) Commissioning documents; (d) Procedures and operating instructions; (e) History of and data on modifications; (f) Operational data for the facility; (g) Data from maintenance, testing, surveillance and inspection; (h) Reports on events and incidents; (i) Radiation protection data, including personal monitoring data; (j) Data on amounts and movements of nuclear and other radioactive material; (k) Records of the discharges of effluents; (l) Records of the storage and transport of radioactive waste; (m) Results of environmental monitoring; (n) Records of the main work activities performed in each location of the facility.	Text of the existing NSR-5 § 9.18	Y			
EN090	09.084 -	The frequency of maintenance, periodic testing and inspection of individual ~~structures, systems and components~~ items important to safety shall be adjusted on the basis of experience and shall be such as to ensure adequate reliability. The operating organization shall assess the results of maintenance, periodic testing and inspection, and incorporate the feedback for continuous improvement.	Homogeneity	Y			

EN091	09.087 -	The criticality safety program~~me~~ shall ensure that operators are aware of the criticality hazard and all operations to which nuclear criticality safety is pertinent are governed by approved procedures. Operators shall be educated and aware of the conditions that may cause a criticality. The procedures shall specify all the parameters that they are intended to control and the criteria to be fulfilled. The program~~me~~ shall set limits for quantities or concentrations of fissionable material in transfers and at appropriate other points in processes	Precision	Y	The program shall set limits for quantities and concentrations of fissile material...		
FR114	09.087 -	The criticality safety programme shall ensure that operators are aware of the criticality hazard and all operations to which nuclear criticality safety is pertinent are governed by approved procedures. Operators shall be educated and aware of the conditions that may cause a criticality. The procedures shall specify all the parameters that they are intended to control and the criteria to be fulfilled. The programme shall set limits for quantities of ~~**fissionable**~~ **fissile** material in transfers and at appropriate other points in processes. Prior to changing the location of process equipment or its process connections, or of neutron reflectors, the criticality assessment shall be updated to determine whether such a change is acceptable.	Fissionable has a broader meaning.	Y	The program shall set limits for quantities and concentrations of fissile material…		
EN092	09.089 -	In addition to the requirements established above, the following requirements for enriched uranium fuel fabrication facilities shall be met; (a) For the transfer of uranium powder or uranium solutions in a uranium fuel fabrication facility, 'double batching' (i.e. the transfer of two batches of fissile material instead of one batch in a fuel fabrication process) shall be prevented by design and by means of administrative control6 measures or shall be analyzed in the demonstration of criticality safety.	If double batching cannot be prevented, it has to be considered as a plausible accidental situation and relevant safety measures have to be defined	Y	New para: For all types of facility where there is a potential for criticality, the accidental transfer of two batches of fissile material instead of one (double-batching) shall be analysed in the demonstration of the criticality safety. Double-batching shall be prevented by design and by means of administrative control measures.		

FR115	09.089 -	In addition to the requirements established above, the following requirements for enriched uranium fuel fabrication facilities shall be met;(a) For the transfer of uranium powder or uranium solutions in a uranium fuel fabrication facility, ‘double batching’ (i.e. the transfer of two batches of fissile material instead of one batch in a fuel fabrication process) shall be prevented by design and by means of administrative control6 measures or shall be analyzed in the demonstration of criticality safety.	If double batching cannot be prevented, it has to be considered as a plausible accidental situation and relevant safety measures have to be defined	Y	As above.		
EN093	09.090 -	Add:For the transfer of Pu powder in a MOX facility, ‘double batching’ (i.e. the transfer of two batches of fissile material instead of one batch in a fuel reprocessing process) shall be prevented by design and by means of administrative control6 measures or shall be analyzed in the demonstration of criticality safety	Double batching does not only concern enriched uranium fuel fabrication facilities but also applies to MOX fuel fabrication facilities	Y	As above. Corresponding changes made elsewhere in this section.		
FR116	09.090 -	The following requirements for MOX fuel fabrication facilities shall be met; (a) For the transfer of MOX powder in a MOX fuel fabrication facility, ‘double batching’ (i.e. the transfer of two batches of fissile material instead of one batch in a fuel fabrication process) shall be prevented by design and by means of administrative control6 measures or shall be analyzed in the demonstration of criticality safety. (b) …	Double batching does not only concern enriched uranium fuel fabrication facilities but also applies to MOX fuel fabrication facilities.	Y	As above.		
EN094	09.091 -	The following requirements for conversion and enrichment facilities shall be met;… (d) Special procedures shall be implemented to ensur~~e that criticality control is maintained wh~~en criticality safety during decommissioning operations, including, as applicable, maintaining criticality control in dismantling equipment whose criticality is controlled by geometry	Wording of 10.6 is more appropriate	Y	(c) Special procedures shall be implemented to ensure criticality safety during decommissioning operations when dismantling equipment whose safety is controlled by geometry		

FR117	09.091 -	The following requirements for conversion and enrichment facilities shall be met;… (d) Special procedures shall be implemented to ensur~~e that criticality control is maintained wh~~en criticality safety during decommissioning operations, including, as applicable, maintaining criticality control in dismantling equipment whose criticality is controlled by geometry	Wording of 10.6 is more appropriate	Y	As above.		
JP014	09.091 - c	(active decommissioning)	There are no description of “active decommissioning” both in DS452 and WS-G-2.4 so it’s definition should be clarified here.	Y	Inserted "(emptying)"		
EN095	09.092 -	Add:Spent fuel acceptance and reprocessing feed programme of a RF shall be prepared and assessed to assure that the safety requirements are met throughout the reprocessing processes. Computational tools shall be developed and used for this purpose.	Spent fuel acceptance and reprocessing feed programme are corner stones for the safety of reprocessing facilities (for criticality, cooling, …)	Y	(a) The feed programme for receiving and reprocessing spent fuel shall be prepared and assessed to assure that the safety requirements are met throughout the reprocessing processes. Appropriate computational tools shall be used for this purpose.		
EN096	09.092 -	Add:For the transfer of Pu powder or Pu solutions in a fuel reprocessing facility, ‘double batching’ (i.e. the transfer of two batches of fissile material instead of one batch in a fuel reprocessing process) shall be prevented by design and by means of administrative control6 measures or shall be analyzed in the demonstration of criticality safety	Double batching does not only concern enriched uranium fuel fabrication facilities but also applies to fuel reprocessing facilities.	Y	See EN092 et. Seq. Corresponding changes made elsewhere in this section.		
FR119	09.092 -	(a) For the transfer of Pu powder or Pu solutions in a fuel reprocessing facility, ‘double batching’ (i.e. the transfer of two batches of fissile material instead of one batch in a fuel reprocessing process) shall be prevented by design and by means of administrative control6 measures or shall be analyzed in the demonstration of criticality safety	Double batching does not only concern enriched uranium fuel fabrication facilities and MOX fuel fabrication facilities. but also applies to fuel reprocessing facilities.	Y	As above.		
RU029	09.092 - ad	We propose to expand this in respect to all NFC facilities.	Requirements are general in their nature.	Y	Moved to a new generic paragraph.		

RU030	09.092 - ec	We propose to delete them or to formulate them as a separate item regarding SNF processing facilities only.	These requirements are excessively specific in their nature; they are not necessary.			Y	Appendix 4 in NS-R-5 (Rev 1) was also specific.
FR118	09.092 - New	Add Spent fuel acceptance and reprocessing feed programme of a RF shall be prepared and assessed to assure that the safety requirements are met throughout the reprocessing processes. Computational tools shall be developed and used for this purpose.		Y	(a) The feed programme for receiving and reprocessing spent fuel shall be prepared and assessed to ensure that the safety requirements are met throughout the reprocessing processes. Appropriate computational tools shall be used for this purpose.		
RU031	09.093 -	We propose to delete it.	These requirements are excessively specific in their nature; they are not necessary.	Y	An explicit reference to R&D facilities has been included in the generic paragraphs.		
RU032	09.094 -	RADIATION PROTECTION. EFFLUENTS AND WASTES		Y	Now: Radiation protection programme, effluents and waste		
FR120	09.094 - Titles before	Radiation protection programme, effluents and waste	Wording	Y			
JP015	09.094 (Title) RADIATION , EFFLUENTS AND WASTES p88	RADIATION PROTECTION, RADIOACTIVE WASTES AND EFFLUENTS ~~AND WASTES~~	Title of this section should be consistent with Requirements 70 (Radiation protection) and Requirements 71 (Radioactive waste and Effluents).	Y	RADIATION PROTECTION PROGRAMME AND MANAGEMENT OF RADIOACTIVE WASTE AND EFFLUENTS		

FR121	09.095 -	The radiation protection programme shall ensure that for all operational states, doses due to exposure to ionizing radiation ~~in the facility~~ or doses due to any discharges of radioactive material from the facility are kept as low as reasonably achievable and are below authorized limits. For design basis accident, the doses shall be as low as reasonably in order to prove the adequate design of the facility.	Exposure to radiation outside the facility or the nuclear site has to be taken into account.		"in the facility" deleted as suggested	Y	**Design basis accident;** A postulated accident leading to accident conditions for which a facility is designed in accordance with established design criteria and conservative methodology, and for which releases of radioactive material *are kept within acceptable limits.* (From IAEA glossary)
FR122	09.097 -	Radiation exposures shall be subjected to dose constraints and **reference levels**, as appropriate, that are set or approved by the regulatory body (or another competent authority) for the purpose of ensuring that the relevant limits for doses and discharges are not exceeded. In all operational states, the main aims of radiation protection shall be to minimise exposure to radiation and to keep doses below the dose constraints to comply with the fundamental safety objective. 9.98.	Consider defining what kind of reference level is appropriate. In IAEA safety glossary: **reference level:** An action level, intervention level, investigation level or recording level.	Y	clarified		
EN097	09.106 Requirement 71		Quotes of GSR Part 5 shall be explicit. Nothing here specific to fuel cycle facilities			Y	The text is used to aid the reader in reducing the need for cross-referencing.
RU023	09.107 -	The programme shall include, as appropriate, the collection, characterization, classification, processing (pre-treatment, treatment, and conditioning), transportation and storage of radioactive waste, discharge of effluents and of waste as well as	Releases/discharges are not subject to storage and processing.	Y	Wastes not subject to discharge. Disposal inserted. Other minor editorial changes.		
JP016	09.107/2	processing (~~pre-treatment~~ pretreatment, treatment, and conditioning)	Editorial.	Y			

DE021	09.108 -	3rd sentence: “Records shall be maintained for generation of wastes and effluents, as well as for the ~~storage, processing,~~ classification, processing, storage and transfer of wastes to disposal facilities.”	<3> Adjust wording to place the different steps in the management of radioactive waste in the correct order. Waste classification precedes processing (i.e. pretreatment, treatment and conditioning) and subsequent storage of wastes.	Y	Changed to; *An appropriate record shall be kept of the quantities, types and characteristics of the radioactive waste processed and stored on the site or transferred to authorized facilities for processing, storage or disposal* . - and moved to preceding paragraph.		
JP017	09.109/1	Approved procedures shall be followed for the collection ~~handling~~, characterization, classification,	Making the description consistent with para.9.107.	Y			
DE022	09.110 -	“An appropriate record shall be kept of the quantities, types and characteristics of the radioactive waste processed and stored on the site or transferred to authorized facilities for processing, storage or disposal.”	<2> Clarification and completion to be in line with the equivalent Para 7.119 of the Draft Safety Requirements DS476 “Safety of Research Reactors” (future SSR-3; latest version dated 4 September 2015). Radioactive waste may also be processed on the site. In such cases, records shall be kept.	Y	Sentence moved to preceding paragraph.		
USA22	09.113	Item (b) “Establishing action levels and effluent limits for protection of the public and workers.”	Effluent limits are for demonstrating compliance with public dose limits, as well.	Y			
JP018	09.113(c)/2	groundwater, soil~~,~~ and biota~~, and flora~~	Editorial. (We recognize that flora is included in biota.)	Y			
DE023	09.115 -	“The arrangements for ensuring fire safety shall be consistent with the nuclear and radiation safety arrangements. Together with the conventional fire safety concerns associated with an industrial installation, fire safety issues relating to nuclear and associated materials shall be assessed (e.g. for uranium metal and zirconium alloy powder)."	<3> In terms of their content, Para 9.121 and the second sentence of Para 9.115 are almost identical. To avoid an unnecessary duplication of requirements, it is proposed to delete Para 9.121 and to insert fragments of text from this paragraph into the second sentence of Para 9.115.	Y			

EN098	09.117 - new	Add. As the response time is crucial for firefighting in the event of a fire or an explosion, the operating team shall be properly and regularly trained in firefighting, and drills and exercises shall be carried out on a regular basis.	§ 9.11 of NS-5	Y			
FR123	09.117 - New	Add. As the response time is crucial for firefighting in the event of a fire or an explosion, the operating team shall be properly and regularly trained in firefighting, and drills and exercises shall be carried out on a regular basis.	§ 9.11 of NS-5	Y			
RU024	09.118 -	It is suggested to read this sentence as follows:'‘...combustible materials and reaction hazards shall be considered.	It is necessary to take into consideration the explosion-hazardous reactions.	Y			
USA23	09.120	Modify Para 120 to read: “The impact of a fire on tanks and cylinders of any hazardous material shall be considered (e.g., UF6, chlorine, propane, etc.).	The scope of the evaluation shouldn't be limited to UF6.	Y			
USA24	09.121	“(e.g. for uranium metal and zirconium alloy powder, and to limit the exposure of pyrophoric materials to air.)”	Uranium and plutonium in finely divided form are pyrophoric and ignite spontaneously when exposed to air. This is a hazard during cutting and milling operations that needs to be addressed.	Y	Use "prevent" not "limit"		
DE024	09.121 -	“~~Together with the conventional fire safety concerns associated with an industrial installation, fire safety issues relating to nuclear and associated materials shall be assessed (e.g. for uranium metal and zirconium alloy powder).~~”	<3> In terms of their content, Para 9.121 and the second sentence of Para 9.115 are almost identical. To avoid an unnecessary duplication of requirements, it is proposed to delete Para 9.121 and to insert fragments of text from this paragraph into the second sentence of Para 9.115.	Y			
DE025	09.124 -	1st sentence: “~~The~~ An accident management programme shall be developed that covers the preparatory measures and guidelines to reduce the risk of accidents and to return the facility to a controlled state …”	<3> Wording/Grammar.	Y			

EN099	09.124 Requirement 74	Delete the requirement 74 Delete § 9.124 to § 9.126	The requirement on “Operational accident management programme” does not exist in the current NS-R-5. The concept seems to come from NPPs (Requirement 19 of SSR-2/2) for which the radioactive materials is “centralized” in the core. For FCFs where the radioactive material is found throughout the entire facility, the measures to reduce the risk of accident and to return to a controlled state are defined in the operating instructions of the units or in the emergency plan. There is no “programme” as such. In addition, § 9.125 is mostly related to design			Y	See e.g. para 4.16 in GSR part 7. This is now R71. Editorial changes have "softened" the supporting text.
CA016	09.127 -	9.127. The operating organization shall establish and maintain arrangements for on-site preparedness and response for a chemical, nuclear or radiological emergency for facilities or activities under its responsibility, in accordance with the applicable requirements (Ref. [7]).	This should be expanded to address non-radiological hazards. See comment 0.	Y			
CA015	09.127 Req. 75 (Page 93)	**Requirement 75: Emergency plan and preparedness**The operating organization shall establish an emergency plan for preparedness for, and response to, a chemical, nuclear or radiological emergency.	This should be expanded to address non-radiological hazards. See comment 0.			Y	Whilst we agree with the principle, the secretatiat felt that chemical hazards had been emphasised sufficiently elsewhere in the text and R72 should be consistent with equivalent statements in GSR part 7.
EN100	09.127 Requirement 75		Quotes of GSR Part 7 shall be explicit. The only FCF specific requirement are 9.131 and 9.132			Y	To aid the reader and maintain consistency with other Safety Series documents.

SE010	09.129, page 93	Change to read: "...shall coordinate with offsite governmental *and municipal* organizations..."		Y	We accept entirely this comment but prefer to refer to generic off-site response organisations. Specific references to centralised government and local municipal organisations have been removed.		
FR124	09.132 -	In dealing with an emergency in fuel cycle ~~processing or storage~~ facility, immediate response shall be focused on — The chemical toxicity of UF6 and its reaction products (HF and UO2F2), which is predominant over uranium's radio-toxicity; — The rapid progression with limited grace period for some scenarios leading to toxicological consequences or contamination by soluble radioactive materials including tritium.	Consider not limiting this requirement to fuel process or storage facilities. Why Tritium is pointed out?	Y	facility type and tritium deleted. "As appropriate" inserted.		
DE026	09.139 -	"The operating organization shall report, collect, screen, analyse, trend, document and communicate operating experience at the facility in a systematic way. It shall obtain and evaluate available information on relevant operating experience at other nuclear installations to draw and incorporate lessons for its own operations, including its emergency arrangements. It shall also encourage the exchange of experience within national and inter-national systems for the feedback of operating experience. These activities shall be performed according to the integrated management system."	<1> Ensuring consistency with the corresponding require-ments for nuclear power plants and research reactors, namely Para 5.33 of the Safety Requirements SSR-2/2 Rev. 1 "Safety of NPPs: Commissioning and Operation" (latest version dated 26 June 2015; final editing after the 39th NUSSC meeting) and Para 7.126 of the Draft Safety Requirements DS476 "Safety of Research Reactors" (future SSR-3; latest version dated 4 September 2015). The last sentence aims to reaffirm that the integrated management system of the operating organization has to ensure the application of lessons learned from operating experience, according to Principle 3, Para 3.12 of the Fundamental Safety Principles SF-1.	Y	"...and shall incorporate..."		
EN102	10.001 - 10.013 to	Keep the only paragraphs that may be specific: §10.4, 10.6, 10.12 and 10.13.	Redundant to GSR Part 6.			Y	This section is of equivalent length and detail to DS476.

EN101	10.001 Requirement 77, line 3	The operating organization shall prepare a decommissioning plan and shall maintain it throughout the lifetime of the facility, unless otherwise approved by the regulatory body, to **show** ~~demonstrate~~ that decommissioning can be accomplished safety and in such a way as to meet the defined end state.	In the original version of the GSR Part 6 (Requirement 10: Planning for decommissioning, here Ref. 8) is used word show instead of demonstrate. Harmony with the original wording.	Y			
DE027	10.006 -	"Measures shall be established in the decommissioning plan to ensure criticality safety during decommissioning operations, including, as applicable, ~~maintaining~~ ensuring subcriti-cality ~~control~~ in dismantling equipment whose criticality is controlled by geometry; and preventing criticality in the temporary storage of waste contaminated with fissile material that is generated by the dismantling of glove boxes and their contents."	<2> More appropriate wording in line with the terminology used in the Safety Guide SSG-27 "Criticality Safety in the Handling of Fissile Material". SSG-27 generally refers to 'ensuring subcriticality' instead of 'maintaining criticality control'.	Y			
EN103	10.006 -	Measures shall be established in the decommissioning plan to ensure criticality safety during decommissioning operations, including, as applicable, maintaining criticality control in dismantling equipment whose criticality is controlled by geometry; preventing criticality in the temporary storage of waste contaminated with fissile material that is generated for example by the dismantling of glove boxes and their contents.	Precision	Y	We agree entirely with this need for clarification, but the entire sentence has been deleted because it repeats text a few sentences later.		
FR125	10.006 -	Measures shall be established in the decommissioning plan to ensure criticality safety during decommissioning operations, including, as applicable, maintaining criticality control in dismantling equipment whose criticality is controlled by geometry; preventing criticality in the temporary storage of waste contaminated with fissile material that is generated for example by the dismantling of glove boxes and their contents.	Precision	Y	We agree entirely with this need for clarification, but the entire sentence has been deleted because it repeats text a few sentences later.		
DE028	10.007 -	1st sentence: "The decommissioning plan shall take into account the processing, storage, transport, and disposal of the waste that is generated during the decommissioning stage."	<2> Clarification.	Y			

DE029	10.008 -	"The decommissioning plan shall include the staffing requirements during decommissioning phase as well as the training and qualification of the personnel involved in the decommissioning operations."	<2> Clarification.	Y			
FR126	10.008 -	The decommissioning plan shall include the staffing requirements during decommissioning phase as well as the training and qualification of the personnel involved in the decommissioning operations.	Typo	Y			
JP019	10.7/1	The decommissioning plan shall take into account the predisposal (processing, storage, and transport)~~,~~ and disposal of the waste that…	- Processing, storage, and transport are included in predisposal. - "Predisposal" should be equally emphasized as "disposal" in this sentence from the perspective of radioactive waste management.	Y	The decommissioning plan shall take into account the predisposal management (processing, storage and transport)		
SE011	11.001 Req. 78, page 97	Add "to the extent possible" (or similar) to the last sentence.		Y			
USA25	11.001 Requirement 78	Interfaces between safety, ~~and~~ security, and safeguards	Requirement 12 indicates that the interface requirement is for safety, security, and safeguards not just security. Suggest you make Requirement 78 consistent with number 12.	Y	R12 and R78 overlapped and R12 is now deleted. R75 now reads; The interfaces between safety, security and the State system for accounting for, and control of, nuclear material shall be managed appropriately throughout the lifetime of the nuclear fuel cycle facility. Safety measures and security measures shall be established and implemented in an integrated manner so that they do not compromise one another.		
DE030	11.003 -	"Selection of a nuclear fuel cycle facility site shall be based on both safety and security criteria. ~~Requirements on the interfaces between safety and security in site selection and evaluation of nuclear installations, including nuclear fuel cycle facilities, are established by Ref. [6].~~"	<1> Please note that the Safety Requirements publication NS-R-3 (Rev. 1) does not establish any requirements on the interfaces between safety and security in site selection and evaluation of nuclear installations. Consequently, the second sentence of Para 11.3 has to be deleted.	Y	Correct, the latest revision of NS-R-3 does not mention security.		

DE033	03 General - Annex	Note: With regard to the acceptability diagram (risk matrix), we notice that the IAEA Safety Guide SSG-30 “Safety Classification of Structures, Systems and Components in Nuclear Power Plants” presents a similar diagram (see Figure 2 on page 9). However, the axes are transposed (i.e. consequences on the horizontal axis and frequency of occurrence on the vertical axis) and additional features are included, showing that design provisions are implemented primarily to decrease the probability of an accident and functions are implemented to make the consequences acceptable with regard to its probability. Please check whether this diagram from SSG-30 and the accompanying explanation can be included in the Annex of DS478, replacing the existing acceptability diagram.	<1> Consistency among IAEA Safety Standards Series publications with regard to the representation of acceptability diagrams.	Y			
FR127	02 General Appendix	Loss of reactivity control・ Cr~~iticality during fuel handling D~~rop of fuel during handling ・Accidents on transport routes (i ~~ncluding collisions into the facility buildi~~ng~~);~~	Criticality is the consequence and not an initiating event. Collisions into the facility building have to be move to the section(6) special internal event.	Y	Crticality deleted from this bullet and collisions moved to section 6.		
DE034	Note on definitions	Last sentence: “Other terms (like administrative control, an~~d s~~afe state, severe accident, early radioactive release and large radioactive release) that have special meanings in this publication are defined in the footnotes .”	<3> For completion. The terms ‘severe accident’, ‘early radioactive release’ and ‘large radioactive release’ are defined in footnotes 13 and 14, respectively. In the context of these Safety Requirements, the terms are considered to be important.			Y	The definitions of these terms are included in the footnotes but they are not special and will be covered by the new glossary.
DE031	Ref. [02]	“… Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, IAEA Safety Standards Series No. GSR Part 3, IAEA, Vienna ~~(in preparation)~~ (2014).”	<3> The final version of the General Safety Requirements GSR Part 3 was published in July 2014.	Y			

JP020	Ref. [02]	"… Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, IAEA Safety Standards Series No. GSR Part 3, IAEA, Vienna ~~(in preparation)~~ (2014)."	GSR Part 3 has just been published.	Y			
DE032	Ref. [11]	"INTERNATIONAL ATOMIC ENERGY AGENCY, Regulations for the Safe Transport of Radioactive Material, 2012 Edition, IAEA Safety Standards Series No. SSR-6, IAEA, Vienna (2012)."	<3> For completeness, the IAEA Safety Standards Series number should be added.	Y			
USA26	Ref. [11]	"INTERNATIONAL ATOMIC ENERGY AGENCY, Regulations for the Safe Transport of Radioactive Material, IAEA Safety Standards Series No. SSR-6, Vienna (2012)".	Reference [11] shoukd be modified to cite the specific IAEA Safety Standard documentation for transportation.	Y			
USA27	Ref. [21]	[21] INTERNATIONAL ATOMIC ENERGY AGENCY, The Interface Between Safety and Security at Nuclear Power Plants, INSAG-24, Vienna (2010).	Add reference to existing guidance from IAEA	Y			
				379		54	