Master Resolution Table for DS478 November 2016 SPESS Step 11

No.	Para	Reason	Proposed New Text	Accepted	Accepted with Modification	Rejected	Reason
CA0003	Appendix A Para A1b Page 102,	Existing text: "...Loss of reactivity control" Proposed text "Loss of criticality controls'	Primary use of term "reactivity" is in applications to reactors. For prevention of inadvertent criticality accidents at fuel cycle facilities, term "criticality controls' is used as per existing national and international standards.	Y			
CA0006	02.013 -	In application of the concept of defence in depth, the chemical hazards associated with the radioactive material (i.e. dangerous chemical properties combined with, or arising from, the chemistry of particular radioactive materials or as a consequence of activities at the facility) need to be taken into account at every level of defence. The potential interaction of multi-facilities or multi-accidents on the same site at fourth and fifth levels also needs to be considered where applicable.	For a complicate nuclear site with multiple facilities, Multi-facilities and multiaccidents that could happen simultaneously, due to a common cause failure such as flooding or earthquake etc.	Y			

CA0007	04.027 -	In accordance with national regulatory requirements, the operating organization shall carry out systematic periodic safety reviews of the nuclear fuel cycle facility throughout its lifetime, with account taken of ageing, modifications, human factor, operating experience, technical developments, new information on site evaluation and other information relating to safety from other sources.	Because a number of nuclear accidents are caused by human errors Therefore human factor should be considered in the safety analysis and safety design process.	Y			
CA0008	06.021 - d	Shall provide for supplementary controls for the facility by means of automatic actuation of safety systems, such that failures and deviations from normal operation that exceed the capability of control systems can be controlled with a high level of confidence. If needed, the operator actions can only be credit in the early phase of safety system failures to ensure that operator could have sufficient time to take the actions.	To be more clear statement for the automatic actuation of safety system and operator actions.	Y	If needed, the operator actions can only be credit in the early phase of safety system failures to ensure that operator could have sufficient time to take the actions., ~~and the need for operator actions in the early phase of these failures or deviations from normal operation is minimized~~		
CA0009	06.027 -	Additional events may be postulated for emergency preparedness and response that were not considered for levels 1-3 of defence in depth. Interactions or impact from accidents occurred simultaneously or sequentially at other facilities in the same site shall be considered in levels 4 and 5 of defence in depth; see GSRPart 7 171.	Should be more specific that only interactions or impact of the accidents, not the accident itself, occurred in other nearby facilities shall be considered in level 4 & 5 of DiD.	Y	For multiple-facility sites, the potential interaction or impact from accidents at other facilities in the same site shall be considered in levels 4 and 5 of defence in depth.		

CA0010	06.184 -	The facility shall be provided with adequate storage for emergency equipment (such as personal protective equipment), instrumentation (including portable instrumentation) for hazard monitoring and a sufficient number of escape routes, clearly and durably marked, with reliable emergency lighting, ventilation and other services essential to their safe use. The escape routes shall meet the relevant international requirements for radiation zoning and fire protection and the relevant national requirements for industrial safety and nuclear security.	In an emergency case, portable instrumentation is needed to monitor the event progression for the safety judgement, when the fixed instrumentation in the field fails to function.	Y			
CA0011	06.185 -	Suitable alarm systems and means of communication shall be provided so that all persons present at the facility and on the site can be given warnings and instructions, in all facility states. The availability of the means of communication necessary for safety within the facility shall be ensured at all times. Means of communication shall be available in the control room and also in the emergency centre from which the emergency response is coordinated. Roles and responsibilities should be clearly defined, such as who should be lead and to make final decision etc., in emergency case when multiple locations and groups are involved. This requirement shall be taken into account in the design and in the diversity of the means of communication selected for use.	Authority of personal should be clearly defined in emergency case, to avoid unnecessary confusion caused by human error during communications among multiple locations and groups.	Y	Added in section 9 R72		

EN0000	General Comment	The structure of the document transfers its reading and adaptation to specific FCF types to a “Graded Approach “ Guide		Y	Some references to the *graded approach* have been replaced by references to the *safety classification* or an *emergency preparedness category*. A report on application of the graded approach is being specified.		
EN0001	General Comment	In FCFs which are mainly chemical plants, the control of chemical processes is not currently split into an “active systems” generally cope with normal operation and accident conditions where the process is shut down.				Y	This is clear but there is no recommendation.
EN0002	General Comment	This concept of collective dose for discharges is new. Collective dose is only used to optimized the workers exposure e.g. for maintenance or modification				Y	As discussed in RASSC
EN0003	General Comment	The concept of “procedure important to safety” is to be avoided as procedures that prevent a safety event and its progression are embedded in normal operation.		Y	Removed		
EN0004	General Comment	Confinement: - The number static barriers for facilities handling dispersible Pu shall be modified	- A dynamic barrier is not always required				

EN0005	02.001 -	Restricting the likelihood of events that might lead to a loss of control of sub-criticality ~~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.	Fuel Cycle Facilities are not concerned with "control over a nuclear chain reaction" but with the "control of sub-criticality"	Y			
EN0007	02.012 -	Add in 2.12, after 2.12 (5) The degree of application of each level of defence in depth shall be commensurate with the potential hazards of the facility and shall be established in the facility licensing documentation	Para. 2.8 of the current NS-R-5			Y	The graded approach appears at the beginning of this para, before bullet 1.
EN0008	03.006 -	The safety analysis report … It shall also contain safety analyses of accident ~~sequences~~ and of the safety features incorporated in the design for preventing accidents or minimizing the likelihood of their occurrence and for mitigating their consequences in accordance with the concept of defense in depth.	The concept of event/accident sequences is no more used in DS 478 (2016-09-27)	Y			
EN0009	04.002 - b	Shall clearly define responsibilities and accountabilities with corresponding lines of authority and communication ~~and shall ensure that individuals with responsibilities for safety are independent of the operations management;~~	This requirement is limited to the safety committee (Requirement 6)	Y			

EN0010	04.002 - d	Shall 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 and correct poor safety practices;	As rigor and leadership is part of the safety culture, the proposal is to keep the text in 4.2 a "Shall foster and sustain a strong safety culture.	Y	(c) Shall develop a strong safety culture and strictly adhere to sound procedures for all activities that may affect safety, ensuring that managers and supervisors promote and support good safety practices and correct poor safety practices;		
EN0011	04.013 -	The management system shall identify and include the following requirements: (a) The relevant statutory and regulatory requirements of the State; (b) Any requirements formally agreed with interested parties; ~~(c) The relevant IAEA safety standards.~~	The relevant IAEA safety standards should be covered by the national safety requirements i.e. c(c) is included in (a)	Y	Clarified *(c) Other relevant IAEA safety standards not covered by the above.*		
EN0012	04.016 -	**Management responsibility** 4.16. Management responsibility includes planning, implementing and providing the means and support necessary to achieve the organization's objectives. Before major decisions affecting safety are taken, management shall seek independent advice as necessary and, if required, agreement by the regulatory body.	The need to consul independent advice is not systematic even for major decision taking	Y	Before major decisions affecting safety are taken, management shall seek independent advice and agreement by the regulatory body where necessary.		
EN0014	05.013 -	Monitoring shall commence ~~no later than the start of construction~~ at the commissioning stage and shall continue through to decommissioning and license termination	There is no reason to start this monitoring if the initial site evaluation is properly done	Y	The programme of monitoring shall be in place no later than the start of construction....		

EN0015	06.001 -	6.1. The main safety functions, the loss of which may lead to significant radiological or associated chemical consequences for workers, the public or the environment, fulfil the principles in SF-1 [1] and specific requirements in GSR Part 3 [2]. A systematic approach shall be taken to identifying those items important to safety that are necessary to fulfil the main safety functions and to defining the conditions and inherent features that contribute to or affect fulfilling the main safety functions for all facility states. A hazards analysis shall be conducted to identify all design basis accidents and their associated initiating events that could challenge or cause the failure of the main safety functions and result in unacceptable consequences. ~~Unless approved by the regulatory body, active systems relied on to ensure the main safety functions shall not be used for normal operation of the facility, see Requirement 10.~~	The last sentence seems to come from reactor world. In FCFs which are mainly chemical plants, the control of chemical processes is not currently split into "active systems" not used during normal operation.	Y	Agree with the concept that active protection systems seldom used in NFCF. Deleted the word "active", rest of sentence remains.		

EN0016	06.002 -	6.2. Confinement can depend on the cooling of some radioactive materials. Confinement shall prevent any unintended release of radioactive material or materials with associated hazardous properties. ~~Planned discharges of radioactive substances shall be as low as reasonably achievable and kept within authorized limits. Any accidental releases shall be limited~~. Secondary safety functions shall be specified where necessary to prevent accidents and to mitigate their effects. Secondary safety functions associated with confinement include ~~the integrity of items important to safety and prevention of the adverse consequences of radiolysis, such as the accumulation of hydrogen~~. preventive measures against hazardous accumulation of gases from radiolysis and other explosive or flammable materials	The first crossed text is not to be put here but on the waste management part The change of the second crossed sentence is for clarity and precision	Y			

EN0017	06.006 -	6.6. The design of a facility and its controls shall provide for adequate protection of workers and the public from radiation exposure and associated hazards for operational states and accident conditions. Acceptable limits for radiation protection associated with the relevant categories of all facility states shall be established, consistent with the regulatory requirements, for both internal and external exposure. Protection shall be optimized with the use of dose constraints and reference levels, in accordance with GSR Part 3 [2]. ~~Collective doses from discharges shall be considered in the optimisation of public exposure, along with individual doses~~.	This concept of collective dose for discharges is new. Collective dose to workers is used only to optimize their work e.g. for maintenance or modification			Y	The concept of optimization applies to individual and collective exposures of people.
EN0018	06.011 -	6.11. Hazards shall be considered in designing the layout of the facility and in determining the postulated initiating events and generated loadings for use in the design of relevant items important to safety. Adequate space shall be provided for operations and processes involving radioactive material, to satisfy requirements for ergonomic design (e.g. for maintenance) and for the optimization of protection and to minimize the risk of collisions that may affect safety.	Account of space for maintenance is important that shall (should?) be taken	Y			

EN0019	06.023 -	6.23. As far as required by the graded approach, the levels of defense 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 shall be challenged only with a very wide safety margin.	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. The concept of "procedure important to safety" is to be defined as procedures that prevent a safety event and its progression are embedded in normal operation.	Y	According to their safety classification, the SSCs providing 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 important to safety shall not routinely be activated or challenged or shall be challenged only with a very wide safety margin.		
EN0020	06.056 -	A comparison of event ~~sequences (or their equivalent)~~ shall be performed to identify the most challenging parameter values. The resulting limiting parameter values, with a reasonable margin, shall be used in the design of items important to safety, including experimental devices in research and development facilities	The concept of event/accident sequences is no more used in DS 478 (2016-09-27)	Y	Potential accidents and events (or their equivalent) shall be analyzed and compared to identify the most challenging parameter values for design.		

EN0021	06.057 -	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. ~~The selection of design codes shall be subject to approval by the regulatory body, when required.~~	The operating organization is responsible of the selection of codes. The task of the regulatory body is to define/validate safety objectives	Y	Where required, the selection of design codes shall be subject to review by the regulatory body.		
EN0022	06.074 -	An analysis of design extension conditions shall be performed when the potential of large release exists. 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 design basis accidents, or to mitigate their consequences, as far as is reasonably achievable. The chemical form of the release and the kinetics of the exposure pathway shall be considered. For facilities where design extension conditions have been identified by the analysis, additional appropriately qualified features, or extensions to the capability of safety systems and procedures, shall be provided to prevent cliff edge effects and other events considered in design extension conditions and to mitigate their consequences.	Self-standing precision The sentence: "The chemical form of the release and the kinetics of the exposure pathway shall be considered" doesn't apply to DEC only; it also applies to DBA. It has to be moved elsewhere or added to DBA part.	Y	Second sentence reworded and moved to R9.		

EN0023	06.077 - a	The analysis undertaken shall include identification of the features that are designed for use in, or that are capable of preventing or mitigating, events considered in the design extension conditions. These features: ~~(a) Shall be independent, to the extent practicable, of those used in more frequent accidents;~~ (b) Shall be capable of performing in the environmental conditions pertaining to design extension conditions, as appropriate; (c) Shall be reliable, commensurate with the function that they are required to fulfil.	DEC defense lines can be the same ones as those considered in accident scenarios	Y	Changed to require consideration of their independence.		
EN0024	06.078 -	Where the results of expert judgment and deterministic safety analyses complemented by probabilistic safety assessments (if available) indicate that anticipated operational occurrences could occur in combination leading to accident conditions, such combinations of events shall be considered to be design basis accidents or shall be included as part of design extension conditions, depending mainly on their likelihood of occurrence and the level of potential release	Precision	Y	And the magnitude of potential consequences.		

EN0025	06.094 -	The principles of redundancy and independence shall be applied as important design principles for improving the reliability of functions important to safety. Where appropriate, items important to safety shall be physically separated and the use of shared systems shall be minimized. The design shall be such as to ensure that no single failure could result in a loss of the capability of a system to perform as intended, except in cases when the facility design and the kinetics of the potential accident are compatible with human protection action	The 'Single Failure Criterion" is not the strict and only design rule for many fuel cycle facilities as the kinetic of most events leading accident (except criticality) is slow compared with NPP case	Y			

EN0027	06.127 -	6.127. The ingestion of a small quantity of some radioactive substances can result in a significant exposure. In new facilities where such substances are handled in mobile form (e.g. in MOX fuel fabrication facilities or reprocessing facilities), ~~at least two~~ three static barriers shall be provided, so that radioactive material is confined inside the first static barrier during normal operations. The second static barrier shall be designed with features for the control of airborne contamination to minimize the radiation exposures of workers in operational states for the entire lifetime of the facility, and to limit contamination within the facility to the extent practicable. The third barrier is the outer wall of the building which is the border with the environment.	Modern designs for handling MOX or Pu powder shall have 3 static barriers.	Y	"at least two" retained		
EN0028	06.137 - g	Installations and equipment for measuring doses to and contamination of personnel and waste and tools prior at the exits of Radiological Control Areas.	Missing	Y			
EN0030	06.162 -	The chemistry of any reactive, pyrophoric, flammable or highly corrosive materials used or produced in the processing of nuclear materials shall be considered in the safety analysis. …	Consistency with the above correction	Y			

EN0031	06.167 -	Non-combustible or fire retardant and heat resistant materials shall be used wherever practicable throughout the nuclear fuel cycle facility, particularly in central locations for the control and distribution of services, such as switch rooms and the control room. … The use of organic substances (such as lubricating oil) shall be limited where they could come into contact with reactive materials or with electrical devices (such as UF6). Less flammable lubricants shall be used wherever possible.	Fire risk	Y			
EN0032	06.170 - b	(b) The safe transport, storage and use of hazardous process materials;	Missing	Y			

EN0033	08.013 -	Cold (or 'inactive') commissioning includes all commissioning and inspection activities … The following activities shall, as a minimum, be performed in cold commissioning □ Verification of safety functions … □ Confirmation of the performance of shielding and containment systems, including the weld quality of the static containment and basic ventilation functions, where appropriate; □ … □Verification that actual external and internal doses to workers are consistent with the assumptions made and the calculations performed during the design, when possible; □ Verification that actual discharges are consistent with calculated discharges and verification of the performance of discharge reduction and control systems, when possible.	Consistency with 8.8 Measurement of actual doses to personnel can be impossible during hot commissioning (ref to 9.6) Testing of environmental discharge control measures may be impossible during hot commissioning (ref to 9.6)	Y			
EN0034	08.017 -	In hot commissioning (and in the early years of operation of the facility, as practicable), the following activities shall be performed: □ Confirmation of the performance of criticality safety controls, where practicable; □ …	Consistency with 8.8	Y			

EN0035	08.025 -	8.25. For reprocessing facilities, the demonstration of spent fuel feed controls ~~following activities~~ shall~~,~~ ~~as a minimum,~~ be performed in cold and hot commissioning~~:~~ ~~ Demonstration of spent fuel feed controls;~~ ~~ Demonstration of effluent monitoring and control~~	Demonstration of effluent monitoring and control is not a requirement specific to reprocessing facilities	Y	Demonstration of iodine monitoring and control		
EN0036	08.027 -	Plutonium processing facilities ~~Mixed oxide and plutonium fuel fabrication facilities~~ 8.27. For Plutonium handling facilities i.e. reprocessing, Pu and MOX fuel fabrication facilities, plutonium or hot commissioning requires major changes in personnel and equipment, containment, criticality, training and radiation protection arrangements: For the operating personnel, behaviours and attitudes supporting a strong safety culture shall be reinforced so as to ensure safe operation with plutonium; The management shall ensure that both the facility and the operating personnel are fully ready for the transition to plutonium commissioning before it is implemented.	This requirement is related to any facility processing plutonium	Y			

EN0037	09.055 -	Where details of the characteristics of materials ~~(and corresponding items)~~ are unavailable and could affect safety, a suitable surveillance programme shall be implemented by the operating organization. Results derived from this programme shall be used to review the adequacy of the facility design at appropriate intervals.	"corresponding items" has to be deleted or detailed to be understandable	Y	Changed to "systems" i.e. electronics that may have a finite life.		
EN0038	09.009 -	In particular, the operating organization shall clearly establish lines of authority and communications between the senior management of the facility, the safety committee(s), nuclear criticality safety staff, radiation protection personnel, maintenance and modification /engineering groups, and the personnel responsible for establishing and applying the management system.	Missing	Y			
EN0039	09.021 -	Put this paragraph in 9.19	Logical order	Y			
EN0040	09.088 - a	In normal operations, a number of parameters shall be measured and controlled to prevent a criticality event.		Y			
EN0041	09.098 -	Adequate time, distance and shielding requirements shall be instituted for workers handling and inspecting radioactive material in process areas or storage who could potentially incur significant cumulative doses.	Missing	Y			

EN0042	09.124 -	The operating organization shall develop an emergency plan … emergency arrangements that are consistent with one another.	Typo	Y			
FR002	06.075	~~6.75. For existing nuclear fuel cycle facilities, a complementary safety reassessment shall be performed to determine the need for implementing mitigatory measures or modifications at the facility.~~	See insertion in 6.74	Y			
FR003	06.077 -	6.77. The analysis undertaken shall include identification of the features that are designed for use in, or that are capable of preventing **~~or mitigating~~**, events considered in the design extension conditions or mitigating their consequences. These features: (a) Shall be independent, to the extent practicable, of those used in more frequent accidents; (b) Shall be capable of performing in the environmental conditions pertaining to design extension conditions, as appropriate; (c) Shall be reliable, commensurate with the function that they are required to fulfil.	Prevention is associated to event and mitigation to consequences.	Y			

JP000	General	General	It is suggested to keep consistency with the description of DS476 (SSR-3) “Safety of Research Reactors”, especially description of overarching requirements,			Y	Non-specific recommendation
JP0001	01.012 - c	Insert a space before “Hazards to workers and public, such as a release of UF_6 would be addressed, as its chemical hazard could exceed its radiological hazard.” to distinguish the above (a), (b) and (d), those are not address in this document.	Clarification the scope.	Y	This bullet has been rewritten.		
JP0005	03.012 -	The criteria for judging safety shall be based on principles for safe design and operation and shall be made available to the operating organization, ideally before the nuclear fuel cycle facility project commences.	Better wording.	Y			
JP0012	06.077 - c	(c) Shall be reliable~~,~~ and commensurate with the function that they are required to fulfil.	Editorial.	Y	Clarified - (b) Shall have a reliability that is commensurate with the function that they are required to fulfil.		

JP0016	06.110 -	Human factors and ergonomic principles shall be applied in the design of remote handling equipment, ~~and~~ gloveboxes, control rooms and panels, with consideration of the situational awareness of operators (e.g. through a holistic assessment of workload, layout, communications and operator support tools).	Editorial.	Y			
JP0019	06.137 - e	Stationary equipment for monitoring and controlling effluents prior to or during their discharge to the environment. Such equipment shall be capable of detecting unplanned ~~discharges~~ release;	Better wording.	Y			
JP0020	06.161 -	The loss of electrical power supply and compressed air services ~~for cooling systems~~ is addressed in requirements 49 and 50.	Clarification.	Y			
JP0022	09.133 -	The emergency plan and procedures shall be reviewed ~~at regular intervals~~ periodically and shall be amended as necessary to ensure that feedback from experience and other changes (e.g. contact details of personnel) are incorporated.	Better wording.	Y			

KR0002	06.181 -	(e) Computer based important to safety systems including reactor protection system are adequately protected against cyber attacks, up to and including the design basis threat. The SDOE(Secure Development and Operational Environment) to ensure the high functional reliability of Computer based important system is established and maintained during lifetime of digital computer system.	New texts should be added because the cyber security and SDOE are to secure high reliability.			Y	Security recommendations should be covered the the IAEA NSS and not in the safety requirements.
UK01	General	The document adds 75 new requirements. ONR queries whether this is really necessary given that many are covered by generic IAEA guidance given in the GSR Parts.	See comment			Y	

UK08	Paragraphs 4.10, 4.21, 4.25, 6.1, 6.29, 6.57, 6.59, Requirement 54 8.12, 8.19, 9.10, 9.16, 9.53, 9.58d 9.71, 9.78, 9.84, 9.86c, 9.106, 9.118, 9.125, Requirement 74 10.2, 10.8	Replace need "for regulatory approval" with "for review by the regulatory body as appropriate".	All these paragraphs & requirements state the need for approval which according to IAEAs official glossary means "the granting of consent by the regulatory body". This blanket requirement is inconsistent with the UK's graded regulatory framework.	Y	A footnote has been added; In this publication, approvals can be given either by the management of the operating organization or by the regulatory body unless otherwise stated. The phrases "regulatory approval" and "approval by the regulatory body" appear rarely in this document.		
EN0006	02.012 (3)	For most types and design of nuclear fuel facilities, 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.	A dynamic barrier is not always required			Y	This sentence already includes the word "may".

JP0002	02.004 - 2.1 and	2.1. …people, including workers, and the environment 2.4. …workers, the public and the environment	Clarify the difference between "people, including workers, and the environment" and "workers, the public and the environment".	Y	Consistent use of "workers, public and environment"		
IQ0001	01.008	The storage of spent fuel and the reprocessing of nuclear waste	To fit with recycling fuel and spent fuel	Y	...reprocessing of nuclear fuel,		
JP0003	02.008 /l4 6.2 /l3 6.127 /l1 6.137 (c) 9.73 /l2	… radioactive ~~substances~~ materials …	If there is no difference between "radioactive materials" and "radioactive substances", "radioactive materials" should be used.	Y	Changed throughout		
JP0004	02.013./ l2	(i.e. dangerous chemical properties combined with, or arising from, the chemistry of ~~particular~~ radioactive materials or as a consequence of activities at the facility)	Better wording.	Y			
UK02	03.011	Delete reference to security threats. "The regulatory body shall take account of associated chemical hazards in making its assessment".	Not all national regulatory bodies are responsible for security at sites.	Y	Reference to "security advice" instead.		
JP0006	04.001 /l3	The operating organization shall possess the necessary competence to ensure that the facility meets all ~~relevant~~ applicable safety requirements.	To keep consistency between requirements 2 and para. 4.1.	Y			

UK03	04.002 b	Suggest "Shall clearly define responsibilities and accountabilities for safety with corresponding lines of authority and communication and shall avoid conflicts with other business roles, responsibilities and accountabilities."	All staff have responsibilities for safety including operations management.	Y			
UK04	04.002 f	In the UK, the government through the Nuclear Decommissioning Agency is responsible for ensuring adequate levels of funding for decommissioning rather than the licensee.	See comment	Y	Added "where these are not provided by Government"		
UK06	04.005	In making safety the highest priority Requirement 3 goes well beyond the requirements of GSR Part 2 Requirement 2. Suggest "that give protection and safety a high priority".	See comment			Y	GSR Pt 2 "organizational approach to safety that stipulates that, as an overriding priority, issues relating to protection and safety receive the attention warranted by their significance" (2016)
JP0007	04.009 Requirement 4	INTEGRATED MANAGEMENT SYSTEM **Requirement 4: Integrated Management system** **The operating organization shall establish, ~~apply, sustain~~ implement, assess and continuously improve an integrated management system for ensuring that all safety requirements are met at all stages of the lifetime of the nuclear fuel cycle facility.**	To keep consistency with requirement 6 of DS 476 "Safety of Research Reactors" and GSR Part 2.	Y			

UK07	04.010	Suggest "in a safe manner and within operational limits and conditions identified in the licensing documentation such as the safety analysis report."	The reference to approved OLC is too narrow. These matters need to be in accord with limits and conditions more widely, e.g. those identified in the licensing document (para 3.5) or as per the SAR (as stated in Requirement 5).	Y			
EN0013	04.025 Requirement 5	**Requirement 5: Safety assessment and periodic safety review** **The adequacy of the design of the nuclear fuel cycle facility shall be verified by means of comprehensive safety assessment that ~~includes~~ results in a safety analysis report and that defines the operational limits and conditions required for safety.**	The SAR and OLCs are derived from the the comprehensive safety assessment	Y			
CA0004	04.030 Requirement 6 Page 22	Append existing text of the requirement by proposed text " in accordance with a graded approach'	Text of Requirement 6 (and follow-up paras 4.30-4.34) does not permit grading, but it should on the basis that there are small fuel cycle facilities (primarily at the front end of the fuel cycle) where a large independent safety committee would not be appropriate or possible.			Y	All nuclear fuel cycle facilities shall have a safety committee. The final sentence of para 4.34 allows the scope of its agenda and the frequency of its meetings to be graded.

UK05	4.29	Suggest "Any modifications that arise from these findings shall be implemented in a timely manner" should be changed to "A graded approach should be taken to ensure that safety significant modifications are implemented in a timely manner".	See comment	Y	Added according to the safety categorization of the modification.		
JP0008	06.001 Footnote 24	The definition of "cliff edge effect" herein footnote 24 could be better to move after para.6.21. (b).	User friendliness. See JP04 next para 6.2	Y			
CA0005	06.020 and 6.25 Pages 31 and page 32	Ethier append existing text of paras 6.20 and 6.25 by "in accordance with graded approach as further specified in para 6.28" or use other editorial changes to make text of paras 6.20 and 6.25 consistent with the graded approach and para 6.25	There are inconsistencies between a graded approach and the wording in paras 6.20, 625 and 628. In particular, para 628 requires application of the graded approach including "determining the required number of levels of defence", whereas paras 6.20 and 625 seem to imply that number of levels of defence is always 5	Y	References to the safety classification of SSC and emergency preparedness category for the facility have been added.		

JP0009	06.029 Requirement 11	**The use of a graded approach in application of the safety requirements for a nuclear fuel cycle facility shall be commensurate with the potential risk of the facility and shall be based on safety analysis~~, expert judgement and~~ or regulatory requirements.**	"Expert judgement" is ambiguous for the basis of deciding the potential risks, while other two (safety analysis, regulatory requirements) can provide clear basis to judge the potential risk. Evaluation of the potential risk will be based on either "safety analysis" or "regulatory requirements".			Y	Use of "expert judgement" is supported by other MS. The text supporting this requirement states that the expert judgement should be documents, suitably qualified / experienced and subject to review.
JP0010	06.067 Footnote 33	The footnote 33 should be moved to para. 6.1. line 6.	Clarification. "Design basis accidents" appears in para. 6.1 at the first time.	Y			
JP0011	06.071 /l4	Where the consequences of ~~accident conditions in the~~ design basis accidents exceed the acceptable limits,	Better wording.	Y			

FR001	06.074	**Requirement 21: Design extension conditions** **A set of design extension conditions shall be derived on the basis of deterministic analysis and expert judgement with complementary probabilistic assessments (as appropriate), in accordance with a graded approach, to further improve the safety of the nuclear fuel cycle facility by enhancing its capabilities to withstand, without unacceptable consequences, accidents that are either more severe than design basis accidents or that involve additional failures. 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.** 6.74. An analysis of design extension conditions shall be performed for new and existing facilities. 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 design basis accidents, or to mitigate their consequences, as far as is reasonably achievable. Events that could lead to cliff edge effect in terms of consequences compared to DBA, have to be studied as DEC. The chemical form of the release and the kinetics of the	Consider explaining the scope of 6.74: new and existing facilities. So, 6.75 could be deleted. Consider explaining that DECs include events leading to a cliff edge effect in terms of consequences (e.g. accidental situations considered in stress test). Prevention is associated to event and mitigation to consequences, including cliff edge effect. Beyond design basis accidents are not addressed in DS478. Are they totally replaced by DEC? Consider addressing this evolution.	Y			

UK09	06.074	Requirement 21 needs to be clear that it applies to new build. We would also only expect severe accident analysis and design extension conditions to be performed for facilities capable of giving a large off-site release. Suggest "For new nuclear fuel cycle facilities a set of design extension…" Similarly, 6.76 should make it clear it applies to new build. Note 35 at the bottom of the page should be deleted.	Provides clarity that this applies to new build.	Y Y	Practical elimination applies to new facilities if anything. Deleted	Y	This is contrary to the view of many MS.
JP0013	06.096 Requirement 24	**The predisposal management and disposal routes for waste shall be considered with the aim of minimizing the overall impact on** workers, **the public and the environment.**	When the impact owing to radiation is discussed, the workers are also essential actors for radiation protection.	Y			
JP0014	06.096 ./l7	Radioactive waste management facilities are themselves nuclear fuel cycle facilities to which the requirements of this publication apply in a graded ~~manner~~ approach.	To keep consistency with para. 1.4. and others used as "a graded approach".	Y			
JP0015	06.109 ./l3	…… in all process states.	Clarify the difference between "process states" and "facility states".	Y	facility states		

KR0001	06.112	Individuals undertaking analyses of human and organizational factors shall be appropriately trained and qualified. Operating personnel who have gained operating experience in similar facilities shall, as far as ~~is~~ practicable, be actively involved in the design process……	To provide clear understanding, the "as far as is practicable" should be replaced with "as far as practicable"	Y			
EN0026	06.115 Requirement 29	The text of requirement 29 should be after Requirement 32 Design provision for commissioning	Logical time sequence	Y	A note has been added to the text to do this at a later stage.		
JP0017	06.125 Requirement 35	**The design shall include means for the dynamic and static confinement of radioactive material and associated hazardous materials**, in accordance with a graded approach.	Clarification. All of nuclear fuel cycle facilities are NOT required to equip both the dynamic and static confinement.	Y	As required by the safety analysis		
JP0018	06.131 Requirement 36	**Provision shall be made for ensuring that doses to operating personnel at the facility will be kept as low as reasonably achievable, with account taken of the relevant dose constraints, and shall be kept below the dose limits.**	Clarification.	Y			

CA0001	06.140 and 9.84 Requirement 38 and Requirement 66 Page 54, page 88	Existing text**: "... and accident conditions."** Proposed New text: **"and conditions that are referred to as credible abnormal conditions, or conditions included in the design basis"**	Term **"...accident conditions"** is not appropriate/applicable for prevention criticality accidents because (1) It does not reflect the wording of a fundamental requirement which is followed by many Member States (i.e. by UK., USA, Canada, India, China, etc.). (2) Furthermore, 'accident conditions' include two components: design basis (DB) and design extension conditions (DEC). As per IAEA documents, various aspects, related to the **DB** and DEC, are allowed to be treated differently, such as assessment methodology (conservative approach in **DB** versus best estimate approach in **DEC),** acceptance criteria (rigid criteria for DBA versus goals or targets for DEC), also see para 6.83 of DS478. Such differences are not allowed by criticality safety regulations and standards. Justification for the proposed text: (1) Proposed text is consistent with the terminology used in existing national and international standards on criticality safety and with other parts of the DS478 on criticality.	Y			

EN0029	06.162 Requirement 40	Design measures to prevent and ~~for~~ control ~~of reactive, flammable~~ hazardous reactions of mixtures and materials The design shall include features to control reactive, flammable, ~~and~~ corrosive and pyrophoric mixtures and materials used or produced in the processing of radioactive material.	Requirement 40 deals with various hazardous materials Pyrophoric materials are dealt with in 6.163 d)	Y			
UK10	09.015	Suggest "for operational states, the number of operating personnel shall be specified either in the operational limits and conditions or through appropriate arrangements under the licence."	In the UK minimum manning levels are covered by Licence Conditions LC11 on emergency arrangements and LC36 on organisational capability.	Y			
JP0021	09.028 Requirement 57	**The operating organization shall derive operational limits and conditions from the safety analysis and shall submit them for ~~consideration by the~~ regulatory approval ~~body~~ in accordance with national requirements.**	The OLCs should be authorized if necessary.	Y			