TITLE : DS351 The use of graded approach in the application of the safety requirements for research reactors Draft 2 18-08-2009

COMMENTS BY REVIEWER Reviewer: F. Féron Page Country/Organization: France -ASN Date: 21 sept 2009				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.			Many paragraphs don't actually give guidance on how gradation may be applied. Only those giving such guidance should be kept.	Accepted.	Many paras now removed as requested in other comments. The intention was to give brief summary of requirements and then move to grading aspects; this is now improved.		
2.			The guide is difficult to read as there are too many cross-references to the AIEA document NS-R-4 (Safety requirements)		Accepted, some changes now made. The SG basis was to use the detailed framework of NS-R-4, therefore repetition from NS-R-4 has been kept to a minimum, see comment #1, but it still is essential to reference every topic of NS-R-4.		

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3.	1.2/1	After "research reactors", add " and associated facilities (storage pool, detritiation facilities, neutronography devices, etc)"	It should be mentioned that the scope of this document covers the research reactor and the associated installations (storage pool and buildings, detritiation facilities, neutronography devices, etc.).	Accepted	The IAEA current definition in footnote 1 is though retained. It is generally understood that supporting facilities for RRs are included in this definition but it is normal to additional mention experimental devices, as the NSR-4 definition does. If there are other sources of activity, (storage pools, detrit.) these are captured in the overall radiological hazard assessment.		
4.	1.3/1	Delete "it is clear that"	Superfluous	Accepted			
5.	1.3/2	Replace "should" by "may"	Allows flexibility and consistency within the guide as some section explicitly state that some requirements are not gradable (and are applicable to any reactor)…	Accepted			
6.	1.3/3	Replace "Thus," by "For example"	Clarification	Accepted			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
7.	2.5 (a)	After the item " Reactor power " add an item "Operating time in power "	Some reactors as CABRI (France) and NSRR (Japan) are pulsed reactors: very large power during a very short operation time (a few ms). So the radiological inventory is limited.		Modified to :"Reactor power, (for pulsed reactors energy deposition would be used)"; Inventory is already covered by (b) source term.		
8.	2.5 (c)	Replace " The type of fuel element " by " the type of fuel (rods, plates, pebble bed) and its chemical composition (uranium dioxide, aluminum-uranium alloy, silicon-uranium compound) ".	The chemical composition has a great importance (ex : possibility of BORAX accident in case of the use of in aluminum-uranium alloy		Changed to 'type of fuel', as quoting is from another safety standard. Type of fuel implies composition is included		
9.	2. 5 (j)	After "Location of the site, with potential occurrence of external hazards", add " (including the proximity of other nuclear facilities) and "	Clarification	Accepted	The referenced safety guide text quotation is though maintained as para 5.2 footnote on site evaluation contains a reference to the proximity of other nuclear facilities.		
10.	3.4/last sentence	After "External experts," add "technical safety organization (TSO)"	Clarification	Accepted	Added.		

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
11.	6.4 (1)	Delete 6.4 (1)	Superfluous example. The possibility to grade is stated in the first two sentences of 6.4	Accepted	Modified para 6.4 to provide clarification.		
12.	6.4 (2)	Delete 6.4 (2)	If (1) is deleted, no need for (2)	Accepted.	Modified para 6.4 to provide clarification.		
13.	6.6/3		Why excluding probabilistic criteria?		Deleted this paragraph as it appears to be superfluous.		
14.	6.7/ last sentence	Delete “This has been discussed in para. 6.4, (Level 4).”	See previous comment proposing to delete the referred paragraph		Left in, as para changed 6.4 was modified		
15.	6.10	Delete 6.10	Although true, no link with the graded approach.		Deleted 6.10 and modified 6.11.		
16.	6.11	Delete 6.11	Superfluous. Does not help to grade the design (although it might help to classify SSC)		As above.		
17.	6.12	Delete 6.12	No link with graded approach			Rejected.	This para is intended to clarify the safety requirement defined in N-S-R-4.
18.	6.13	Delete 6.13	Although true, no link with the graded approach		Modified to reflect graded approach so it is applicable. Now is para 6.11		
19.	6.14	Delete 6.14	Although true, no link with the graded approach			Rejected	This para is intended to clarify the safety requirement defined in N-S-R-4.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
20.	6.15/6	Delete "The identification of the DBAs is gradable."	Inconsistent with the previous sentence which states that DBA shall be identified.	Accepted	Modified to clarify. This statement is not inconsistent. The process is not gradable; but the degree of detail is gradable.		
21.	6.20	Delete 6.20	Although true, no link with the graded approach	Accepted			
22.	6.21	Delete 6.21	Although true, no link with the graded approach	Accepted			
23.	6.25	Delete 6.25	Duplicates last sentence of 6.24	Accepted			
24.	6.27	Delete 6.27	Although true, no link with the graded approach	Accepted			
25.	6.31	Delete 6.31	Although true, no link with the graded approach	Accepted			
26.	6.34	Delete 6.34	Although true, no link with the graded approach	Accepted			
27.	6.36		Ergonomic principles also concern the writing and the presentation of the operating procedures	Accepted	Included to add writing of procedures		
28.	6.40	Delete 6.40	Although true, no link with the graded approach	Accepted			
29.	6.45	Delete 6.45	Although true, no link with the graded approach	Accepted			

COMMENTS BY REVIEWER Reviewer: F. Féron Page Country/Organization: France -ASN Date: 21 sept 2009				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
30.	6.46	Sentence to be added: "It is the safety analysis which allows to identify how and in what extent the prevention can be graded with the potential hazard of the reactor. The acceptability of the addition of all the graded provisions has to be validated by the safety analysis."	Clarification		Included, but using similar wording suggested by another reviewer.		
31.	6.47 (a) to (c)	Delete 6.47 (a), 6.47 (b) and 6.47 (c)	Although true, no link with the graded approach. If a facility is small, or with inherent safety features, safety analysis will be simpler (but not graded).			Rejected	The items discussed do appear to be relevant to the scope and detail of the safety analysis.
32.	6.48		What about BDBA ?			Rejected	BDBAs not considered for failure to shutdown in N-S-R-4.
33.	6.50/1	Delete "Different reactivity mechanisms can be used according to the reactor design (e.g. burnable poisons in fuel assemblies and soluble neutron absorbers)."	Although true, no link with the graded approach	Accepted			
34.	6.55	Delete 6.55	Although true, no link with the graded approach			Rejected	This para is intended to clarify the safety requirement defined in N-S-R-4, but also mentions grading.
35.	6.57	Delete 6.57	Although true, no link with the graded approach			Rejected	This para is intended to clarify the safety requirement defined in N-S-R-4 but also mentions gradable features.
36.	6.60	Delete 6.60	Although true, no link with the graded approach	Accepted			

COMMENTS BY REVIEWER Reviewer: F. Féron Page Country/Organization: France -ASN Date: 21 sept 2009				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
37.	6.63	Finish the first sentence by " gamma irradiation, neutron flux and cooling fluid chemistry ".	Clarification	Added.			
38.	6.67	Complete the sentence " If the need … its operational requirement by " with in particular the parameters to be supervised and the needed actions so to keep the reactor in a safe shut down state. "	Example: the complementary control must control the ventilation system (fans, louvres).	Added.			
39.	6.71	At the end of the sentence " the aim of these requirements…irradiated fuel " add " and experimental devices "	In some RR, a special attention has to be given to the storage of irradiated experimental devices	Added.			
40.	6.72	Delete 6.72	Although true, no link with the graded approach		Deleted, but moved (a) and (c) on fuel storage and (d) on heat removal to para 6.71.		
41.	6.74 (2)/2	Delete "Similarly, the use of process air may be required for some special air-cooling functions, for experimental devices, or to operate pneumatic valves for safety or control purposes."	Although true, no link with the graded approach	Accepted			
42.	6.74 (3)	Delete 6.74 (3)	Although true, no link with the graded approach	Accepted			
43.	6.77	Delete 6.77	Although true, no link with the graded approach	Accepted			
44.	6.82	Delete 6.82	Although true, no link with the graded approach			Rejected	Design features can be graded, according to hazards.
45.	6.84	Delete 6.84	Although true, no link with the graded approach	Accepted			

COMMENTS BY REVIEWER Reviewer: F. Féron Page Country/Organization: France -ASN Date: 21 sept 2009				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
46.	7.2		It has to be noted that some RRs need two types of personnel (operators and experimenters). So special arrangements are usually required.		Ref. [1] para 7.3 already identifies requirements for experimenters, so this note is not appropriate for para 7.2		
47.	7.7/1	Delete "The structure of the operating organization may affect the way of implementing the programme but should not affect its functionality. It may be appropriate to supplement inhouse capabilities with external provisions."	Although true, no link with the graded approach	Deleted.			
48.	7.25 (c)	Delete 7.25 (c)	Although true, no link with the graded approach	Deleted.			
49.	7.36	Delete 7.36	Although true, no link with the graded approach	Deleted.			
50.	7.37	Delete 7.37	Although true, no link with the graded approach	Deleted.			
51.	7.44/5	After "the population" add "and effects on the environment"	Environmental consequences have to be taken into account	Added.			
52.	8.3	At the end of the paragraph add: " For some RRs, the departure of many staff members is to be managed when the reactor is definitively stopped in order to keep the installation knowledge during decommissioning operations."	Clarification	Added, with some modification .			

COMMENTS BY REVIEWER Reviewer: F. Féron Page Country/Organization: France -ASN Date: 21 sept 2009				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
53.		A new chapter " Periodic Safety Review " has to be added between chapter " 7. OPERATION " and chapter " 8. DECOMMISSIONING " with the following recommendations **Nature of the requirements** XX.1 During the operation of a research reactor, Periodic Safety Reviews (PSR) should be carried out by the operator and the results submitted to the Regulatory Body.	It is worthwhile to add a chapter on periodic safety reviews			Rejected Rejected	NS-R-4 structure is being followed and safety assessments, including PSRs, are discussed in para 7.59 to 7.64 (now 7.57 to 7.62) and also in chapter 4, see para 4.2. No link with gradable approach,. Para 4.16 of NS-R-4 requires only that the strategy should be agreed by the reg. body; they can be self assessments.

COMMENTS BY REVIEWER Reviewer: F. Féron Page Country/Organization: France -ASN Date: 21 sept 2009				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		XX.2 PSR should also be performed after major safety significant events (major incident, accident, accident on a similar installation, etc.), large modifications or after a long extended shutdown.				Rejected.	No link with gradable approach. Assessments of modifications and their cumulative effects are already discussed in para 4.3.
		XX.3 In the PSR, account should be taken to: ▪ the potential nature and magnitude of the hazards, ▪ the operating experience, ▪ the changes in the regulation and the safety standards, ▪ technical developments and new safety related information from relevant sources ▪ the compliance of SSCs with their design and operational requirements in the safety report and in OLCs, ▪ the outcome of ageing programme.		Accepted with respect to changes to regulations and standards. Other items are already included.	Included changes to regulations and standards in para 4.3. Para 4.8 and 7.59 (new rev.) mentions the potential risk and importance of safety functions in the context of safety assessments. Para 7.64 (old rev.) already mentions new regulations. Para 4.3 already discusses tech developments, operating experience and ageing for PSRs.		

COMMENTS BY REVIEWER Reviewer: F. Féron Page Country/Organization: France -ASN Date: 21 sept 2009				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
54.		**Application of grading** XX.4 Although a period of 10 years is usually appropriate, the time between two PSRs may be graded depending on the potential hazard of the reactor, the operational feedback, the international feedback on similar installations, new R&D findings, the evolution of requirements and operating rules on similar installation, etc.	It is worthwhile to add a chapter on graded approach for periodic safety reviews.	Accepted re frequency of review.	PSR and these aspects are already discussed in paras. 4.2 / 4.3 and paras 7.52 to 7.57 (in new rev). Added mention of frequency of review to para 4.6(e). Para 7.62 already notes the review frequency should be variable. Para 4.8 already states mention of grading for frequency.		
		XX.5 Similarly, the depth of the review and assessment by the operator for the PSR can be graded, with more details in the analyses on the safety concerns of most importance.		Accepted.	Already mentioned in para 4.6(d) but changed to 'depth' rather than 'degree' for operational safety reviews. Also included depth to para. 7.62 (in new rev.)		

COMMENTS BY REVIEWER Reviewer: F. Féron Page Country/Organization: France -ASN Date: 21 sept 2009				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		XX.6 For some research reactors, implemented with numerous and diverse experimental devices leading to specific modifications of equipments, the check of the compliance of the SSCs (see XX.3 above) should be particularly extended and detailed.		Accepted	Added, for experiments and also OLCs. In para 7.62 (in new rev.)		

Comments on IAEA Draft Safety Guide
"The Use of a Graded Approach in the Application of the Safety Requirements for Research Reactors" (DS351 Draft 02)

COMMENTS BY REVIEWER Reviewer: NUSSC Country/Organization: United States of America / NUSSC Date: September 21, 2009				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	2.4 / 1	Define "engineering judgment".	Licensee's interpretation as to what comprises engineering judgment is considerably variable and not always conservative.		Rather than omit, to avoid using a clear definition (not available definitively) NS-R-4 para 6.13 was used to amplify the text. *…in which account is taken of their safety function and the consequences of failure to perform their functions.*		
2	3.8 / 8 (e)	Define the acronym "OLC"	use of undefined acronym	Accepted			
3	4.3 / 4	"…evaluation, ~~physical~~ security, and emergency planning."	Clarity		Modified, some of this comes from para 7.108 of Ref. [1] as stated.		

COMMENTS BY REVIEWER Reviewer: NUSSC Country/Organization: United States of America / NUSSC Date: September 21, 2009				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
4	6.49 / 3	"…effects such as integrated neutron flux, thermal, mechanical and ~~chemical stresses~~ chemical corrosion on various…"	"chemical stress" is not a normal use	Accepted, changed to chemical compatibility.			
5	6.55 / 5	"(a) ~~at seismically active sites~~ at a site which could be impacted by a significant seismic events, a seismic sensor may be required to shutdown the…"	This statement is misleading as it suggests that reactors could be located at seismically active site.	Sometimes they are. But accepted and changed text.			
6	6.71 / 5	"Requirements related to the prevention of damage and to ensuring ~~physical~~ security…"	Clarity	Accepted			
7	7.44 / 3	Define the acronym "BDBA"	use of undefined acronym	Accepted	Already defined in para 6.68		

Draft Safety Guide DS 351 "The Use of a Graded Approach in the Application of the Safety Requirements for Research Reactors"

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety** (BMU) Page..1 of.1. Country/Organization: **Germany** Date: 17.09.2009				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1		General Remark: The structure of the guide changes on the level of sub chapters e.g.: Chapter 3: subchapter "Application of grading" with subchapters according to the subjects of Ref 1. Chapter 7 vice versa. This should be harmonized		Changed, stucture now consistent throughout chapters			
2	4 + 7	Some subchapters of Ref 1 are not mentioned in this guide e.g. Physical protection (Chap 7. Operation)			Now noted in chapter 7 para 7.1 that physical protection (from NS-R-4) is out of scope		
3	7.5/Line 2	.. in paras **7.27** to 7.28 of …	Paras 7.11 to 7.27 of Ref 1 deal with requirements on personell, require-ments on training start with par.7.27	Accepted			
4	7.64 /7.65	7.65 The requirements for aging related aspects are presented in para. **7.109 …** Following no. of paras are to be adapted	The para is not numbered. Aging is addressed only in para 7.109 of Ref 1	Accepted	Changed in both 7.59 and 7.64: Note the Table of contents for p.90 and p.93 of NS-R-4 is incorrect		

The Use of a Graded Approach in the Application of the Safety Requirements for Research Reactors
DRAFT SAFETY GUIDE DS351

COMMENTS BY REVIEWER Reviewer: Page 1 of.... Country/Organization: Japan/ MEXT Date:11 Sept. 2009				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	How are 'risk' and 'hazard' used properly? For javascript:g('For')example, 'radiological hazard(Para.1.3)' and 'radiological risk(Para.2.8)' , 'a low potential hazard reactor(Para.7.4)' , 'Low risk research reactors(Para.7.35)'.			The use is correct as stated (both may be used, although the definitions are different) but it was changed to radiological hazard throughout for consistency		
2	Para.1.6 p.2	Change "Systems, Structures and Components (SSCs)" to "Structures, Systems and Components (SSCs)"	Editorial	Accepted.			
3	Para. 2.1 P4	2.1. A graded approach is applicable to all the stages ~~during the various stages~~ of a research reactor's lifetime'	Editorial	Accepted.	Changed to: A graded approach is applicable to all the stages during the various stages of a research reactor's lifetime, see para 1.7		

4	Para. 2.5 p5	Add one item on the list: (l) The difficulty or complexity of decommissioning and the resultant amount of radioactive wastes.	It is necessary to add the factor concerning Decommissioning.			Rejected	This is not in the quoted reference as a facility hazard criterion. Decommissioning is discussed in Chapter 8.
5	Para. 2.9 P6	(iii) No radiological hazard potential beyond the reactor hall nor utilization areas.	The utilization area which is connected to reactor hall exists in the research reactor. It is necessary to include the area in rank (iii).	Accepted	Changed to …..potential beyond the reactor hall and associated beam line or connected experimental facility areas.		
6	Para. 3.7 2nd line P9	Add "are", as like "… approvals are issued."	Editorial	Accepted .			
7	Para. 3.8 P9	Add a reference to the document that describes regulatory processes.	For better reader understanding.		Ref. 30 on licensing process added		
8	Para. 3.8 (b) P9	(b) review and assessment of documents including SAR.	Add "including SAR". SAR is an essential document for review and assessment.		Changed to: …assessment of all safety-relevant documents, particularly the SAR		

9	Para. 3.9 4th and 5th line P10	Delete "new experiment or modification for a facility".	"new experiment or modification for the facility" is unnecessary, because they are included a reactor as a whole.	Agree, deleted			
10	Para. 3.10 last line P10	Add a period at the last sentence.	Editorial	added			
11	Para.4.4 2nd line P12	Delete "items".	Editorial	done			
12	Para.4.4 Last line P12	Delete "regulatory"	Regulatory reviews are not management responsibility of an operation organization.	Accepted			
13	Para. 4.5 8th line P12	"safety" should be added before "significance".	For better understanding.	Accepted			
14	P12 fn.13		Safety Series No. 50-C/SQ is not found at IAEA website publication pages.	Deleted, obsolete reference			
15	Para. 4.7 3rd line P13	Change "Section 7.49" to "para 7.48".	Editorial	changed			

16	Para. 6.1 3rd line P14	Change "paras 6.5 to 6.12" to "paras 6.2 to 6.9".	Editorial	changed			
17	Para. 6.4 2nd line P15	…may be met by inherent characteristics of the research reactor,	"research" should be added before "reactor". For clear understanding.	changed			
18	Para. 6.7 17th line P17	Acceptance Criteria[15] and Design ~~Requirements~~ Rules	Requirement → Rules Editorial (keeping consistency with Ref.1)	changed			
19	Para. 6.9 2nd line P17	…form of engineering design ~~requirements~~ Rules.	Requirement → Rules Editorial (keeping consistency with Ref.1)	changed			
20	Para. 6.13 P18	6.13. The codes and standards used in the design of SSCs should be appropriately selected ~~in accordance with~~ taking into account of the safety classification of the SSCs and the potential radiation hazard of the reactor.	In this document, the codes and standards are assumed to be dependence on the classification of SSC. However, the matter on a structural design is also included in the codes and standards. Structural design is not necessarily related to the importance of a function.	changed			
21	Para. 6.15 3rd line P18	Ref. [1] para. [~~2~~6.17] requires:	Para 2.17 → para 6.17 Editorial	changed			
22	Para.6.17 Second line P19	Design for reliability may require the use of redundancy, ~~fail-safe criteria,~~ diversity and Independence, and fail-safe criteria.	(Redundancy, diversity, independency, and fail-safe criteria are different design concepts.	changed			

23	Para. 6.17 7th line P19	Where ~~an automatic~~ a passive or inherent safety function is required, a minimum reliability requirement should be established and maintained.	'automatic'→'passive or inherent'	Accepted	Added, but kept automatic as this means active components.		
24	Para.6.20 P19-20	To ensure fulfillment of the safety functions, one solution or another (grading) should be applied according to the operating organization needs with approval of the regulatory body.	(The approval of a regulatory body is required.	added			
25	Para.6.24 10th and 11th line P20	~~Most attention should be given to components of systems important to safety having high obsolescence rate (such as computerized systems or I&C systems).~~	The last sentence should be deleted. Editorial (The sentence is duplicated to para 6.25.)	deleted			
26	Para. 6.47 3rd line P25	The applicability of the analysis methods needs to be justified, but the ~~extent of~~ effort for such justification may be graded.	Editorial	changed			
27	Para. 6.47 item (a) P25	A low-power reactor having a limited hazard potential ~~requires~~ may require less analytical detail than a higher power level reactor.	It may not be always. ('may' is added.)	changed			
28	Para. 7.1 P35	Please itemize the fifteen operational topics in footnote, for better understanding.	It is necessary to show 'Fifteen operational topics' concretely.			Rejected.	Listed in table of contents

29	Para.7.64 Last line P50	With regard to reactors with more than 20 years of operation more emphasis on safety assessment of component ageing would be expected, particularly with regard to passive components and control systems.	Passive components important in ageing is added.	Accepted			

Egypt Comments to DS351

COMMENTS BY REVIEWER Reviewer: Moustafa Aziz Ibrahim Page.... of.... Country/Organization: Atomic Energy Authority , Egypt Date: September 18 , 2009				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1.7	Third line of para 1.7, there is missing bracket	Typing error		Removed bracket, is an improvement.		
2	2.1	A graded approach is applicable to all the stages of a research reactor's lifetime , see para 1.7	Typing error	Accepted			
3	3.12	(b) The complexity of the remedial, corrective or preventive or action needed;	Typing error (comma instead of point)		Changed some of these items as per other reviewer comments,		
4	5.3	Examples of the application of graded approach to site evaluation should be given here		Accepted, more information now provided from the references previously quoted			
5	6.1	Paras 6.2 to 6.9 discuss the use of grading in the philosophy of design. Para 6.10 to 6.47 discuss the use of grading in general requirement Paras 6.48 to 6.85 discuses the use of grading in the application of specific requirement for design	Instead of para 6.5 to 6.12 Instead of para 6.10 to 6.49 Instead of para 6.50 to 6.82	Accepted.			
6	6.4 and 7.56	In Para. 6.4 under the title for Level 4 ,	-there are contradictions	Accepted, text			

		it mentioned that" The reactor building for a critical assembly , with a minimal source term for instance , may require only conventional industrial standard construction while an intermediate power level reactor with potential for a substantial source term may require a confinement system with clean up capability and controlled release of effluents" While in para. 7.56 " It should be noted that a critical assembly may present a higher hazard of external radiation exposure for operating personnel than a high power reactor , dedicated to radioisotope production "	between 6.4 and 7.56 , para 6.4 consider critical assembly of low potential hazard than research reactor and para 7.56 states that a critical assembly may present a higher hazard of external radiation exposure than a high power reactor. - It is better not to rely only on conventional industrial standard construction for critical assembly , because in some cases of reactivity accidents critical assembly may be of higher potential hazard	modified and deleted radioisotope reference. Accepted, added a note on building also, as suggested.			
7	6.25	Two lines before Item 6.25 should be deleted , it is repeated twice with item 6.25		Corrected			
8	6.67	The I & C system should measure reactor parameters and allow for appropriate response…	Measure instead of monitor because protection system who monitor reactor parameters	Changed, but either word should be acceptable.			

TITLE: DS 351 – The Use of a Graded Approach in the Application of the Safety Requirements for Research Reactors

COMMENTS BY REVIEWER Reviewer: Regulator Pages: 01 of 02 Country/Organization: PNRA Islamabad Date: 10-09-2009				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Background Para 1.4, Pages1& 2	A new paragraph may be added after Para 1.3: **"The purpose of the graded approach is to identify activities which have the potential for significant negative impact on quality and to guide the selection of controls to apply to those activities. This focuses management attention on activities which require the most control and oversight."**	The definition and purpose of graded approach should be defined in draft safety guide so that it should be easily understandable by all the stakeholders. This Para has been taken from "The graded approach procedure of Fermi-lab's Integrated Quality Management Program".		Accepted. but IAEA approved definition of graded approach should be used. This was in Section 2.3, taken from the safety glossary. The full definition form the glossary is now used and has been moved to para 1.4.		
2	Para 3.1 Page 8	3.1 Regulatory Supervision (a) Legal infrastructure; (b) Regulatory body; (c) Licensing process; (d) **Safety analysis report** (e) Inspection and enforcement programme.	Safety analysis report is the main licensing document which is an important link between operating organization and Regulatory body, therefore, it should be discussed keeping in view the graded approach.		Based on the DPP the document content was to be structured on NS-R-4 where (a) to (d) titles are used. The SAR is discussed as a subsection of Licensing Process in NS- R-4. The SAR is also discussed again in detail in Section 6.46.		
3	Para 5.1 Page 14	**Comments:** Since effects of population, other nuclear facilities or industry, capability			Accepted; a list of the factors to be considered has		

		for ultimate heat sink, meteorological condition, and other siting characteristics are more significant, therefore; the graded approached for these factors may be included.			been added.		

TITLE DS351 The use of Graded Approach in the Application of the Safety Requirements for Research Reactors Draft 2009/08/18

COMMENTS BY REVIEWER Reviewer: Bava Giovanni Page..1.. of..1 Country/Organization: ISPRA ITALY Date: 2009/09/21				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	6.46	…..for demonstrating the licensability of the proposed design. The safety analysis has to confirm that the grading of the requirements has been performed in a consistent and balanced way.	There are several requirements that can be graded. The overall balance of the design requirements may be lost. The safety Analysis should reliably ensure that the desired safety level is reached. It is proposed to add a new sentence	Agree, have added the sentence.			
2	6.47	……the extent of such justification may be graded. The use of enveloping events may be graded. The completeness of the PIE which are enveloped by the events actually analyzed and the conservatism of the assumptions on the effectiveness of the preventive and mitigative features have to be demonstrated.	The grading concept applies to the safety analysis in a different way, more in the sense to allow the use of simplified, umbrella demonstrations.	Accepted	Added sentence, now in 6.45.		