Member States Comments on DS397

Safety in the Utilization and Modification of Research Reactors

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AUSTRALIA

Safety in the Utilization and Modification of Research Reactors: DS 397

COMMENTS BY REVIEWER		RESOLUTION
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Country/Organization: Australia/ARPANSA	Date: 3/12/2010	

Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	*General*	This publication is to be a revision of SS 35-G2. Revisit SS 35-G2 and only make essential changes.	Where DS 397 departs from SS 35-G2, the result is often imprecise and confusing. A few examples are provided in the following comments.				
2	*2.1*	Refocus *Section 2. Management System for the Utilization and Modification of a Research Reactor* to be on *Organization and Responsibilities*, as in SS 35-G2	The responsibilities for safety expressed in SS 35-G2 are lost in a focus on producing a documented management system (which is important to support management in meeting its responsibilities. Its production is one of the management responsibilities. The management responsibilities, however, are overriding). An indication of this loss is given by the weak introductory definition of management responsibility in 2.1 which states: *Management Responsibility includes providing the means and support needed*				Section 2 of DS 397 gives guidance for the specific aspects for management system regarding utilization and modification only. The other Management System aspects are discussed in other Safety Standards and clear references to those SS are available. Para 207 – 220 of SS 35-G2 are a combination of requirements and guidances regarding QA aspects and responsibility for safety, and addressed in different paras in DS 397. All paras of G2 are covered e.g.

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			to achieve the organization's objective.				Old 207: see new 2.1; 2.2; 2.5 Requirements as old 208; new 5.1 and NS-R4 para 4.1 but requirements are not repeated. Old 209, see new 5.30. Old 210; new 5.1. Etc
3	*2.1*	*Process implementation* should be a separate bullet from *Management responsibility*		X			
4	*2.9/2.11*	Delete either para 2.9 or 2.11	Paragraph 2.9 essentially repeats 2.11	X			

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5	*2.12/2.14*	Rewrite 2.12 and 2.14	2.12 requires the operating organization to provide appropriate resources to *supervise* suppliers. 2.14 states that the management system on site should be *extended to include suppliers.* Contrast these vague and confusing statements with the clear and informative statements in paragraphs 606 and 607 from SS 35-G2: *606. New components or existing ones that have to be modified are generally fabricated or modified by suppliers in accordance with the detailed specifications (including accident criteria) that have been established during the design phase.* *Before selecting a supplier, the project manager shall ensure that the supplier has gained the necessary experience for the work and is aware of all particular constraints of the project, including QA requirements (see para. 514). Preliminary visits to the supplier are generally indispensable.* *607. If necessary, the project manager shall also ensure that the supplier has an appropriate QA programme.*		. The text of 2.14 has been modified for clarity. 2.12 and 2.14 discusses management system aspects.		2.12 give guidance on the availability of sufficient staff to supervise external personnel working on the site, which is essential to ensure safety. 2.14 gives guidance regarding the management system aspects of a supplier, manufacturer or designer All aspects are covered, e.g. old 5.14 is covered in several paras of section 2. Old 606, see new 6.5 Old 607, see new 2.14

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6	*2.25*	Rewrite 2.25	2.25 States that the reactor manager should be responsible for proper scheduling of the implementation of the utilization or modification project. Surely this is only for scheduling with respect to operation of the project considering reactor operation and availability. Wouldn't the project manager be responsible for scheduling design, procurement and construction of the project components before insertion in the reactor? (See the responsibilities of the reactor manager in paragraph 216 of SS 35-G5)				2.25 discusses the scheduling for safe implementation. The responsibilities of the project manager are already defined in 2.19 – 2.25
7	3.1	Rewrite section 3	3.1 The section on categorization and safety assessment is very confused, especially compared to the clear language in SS 35-G5. For example SS 35-G5 states in paragraph 307: *This assessment of hazard will determine the categorization …*, which is		All utilization and modification projects should be subjected to **a screening process in order to determine their safety implication and the related safety category of the utilization or**		

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			correct. However, paragraph 3.1 states: *All utilization projects should be subject to a categorization process in order to determine their safety implication*, which implies the inverse.		**modification. The screening process should be documented and the selected safety category should be justified**		
8	3.4	Rewrite section 3	3.4 Introduces safety classification as distinct from safety categorization, without indicating what the distinction is. This is unnecessary and confusing.				Section 3.3 explains that the safety classification should be based on the safety classification of a system, Structure or Component, or of the safety classification of the utilization. This safety classification is the bases for the safety categorization which determines the safety significance as discussed in 3.7-3.36. The safety classification for SSCs are discussed in NS-R-4 para 6.12 and 6.13. The classification for utilization is not yet discussed in a Safety Standard. Therefore it is discussed in3.4 – 3.6 in this guide.
9	3.7	Rewrite section 3	3.7 (As in 3.1), refers to a classification having				See 3.1

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			potential impacts on safety.				
10	4.9	A utilization or modification should not significantly affect the overall radiation protection concept of the initial design, particularly the reduction of doses to levels that are as low as reasonably achievable (ALARA principle).	4.9 is a typical example of a change in the wording from SS 35-G5 which distorts the meaning. Paragraph 4.9 states *A utilization or modification should not significantly affect the overall radiation protection programme for the research reactor facility, particularly where doses have already been reduced to levels that are as low as reasonably achievable (optimization principle).* This separates the situations where doses have been reduced to ALARA levels from situations where doses have not, and indicates that it is less important to avoid affecting the radiation protection programme for the latter. The proposed new text, derived from SS 35-G5 paragraph 407, states that the experiment should not compromise the ALARA principle.		Text has been adapted: *A utilization or modification should not significantly affect the overall radiation protection programme for the research reactor facility~~., particularly where doses have already been reduced to levels that are as low as reasonably achievable (optimization principle).~~* . …… …….*If the experiment or modification would otherwise affect the overall radiation protection measures, then additional measures* ***should*** *be taken to reduce the dose to personnel during the installation of the project,*		

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					operation, handling and dismantling of an experiment, or the implementation of a modification ***to levels as low as reasonable achievable (optimization principle).***		
11	4.16	Annunciators should operate at an alarm level somewhat below the safety limit.	SS 35-G5 paragraph 414 provides a margin for error – the statement in 4.16 provides no margin for error.				By leaving out the word "somewhat", which means a bit the new para provides more margin for error.
12	General		From Section 5 onwards, there appears to have been little change from the corresponding sections in SS35-G5 and these sections are thus clear and concise and provide useful guidance.				

FINLAND

No comments

FRANCE

DS 397 Safety in the Utilization and Modification of Research Reactors

COMMENTS BY REVIEWER Country/Organization: FRANCE ASN/DRI Date: DEC 2010 Pages				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	§ 2.8 p.6	Add a bullet : presentation of the experience feedback for similar modification and utilization	Experience feedback is of main importance	Y			
2	§ 3.20 p.13	This paragraph is empty		Y			
3	§ 3.22 p. 13	At the end replace " as well as accidents" by " as well as design and beyond design basis accidents "					Operational states and accident conditions define all possible operational states conform to both NS-R.1, NS-R4 as well as to the new draft requirements for Safety of Nuclear Power Plants: Design No. SSR 2/1 (DS414)

4	§ 4.18 p.18	Replace " heat generation due to neutron and gamma deposition needs to be considered " by " a particular attention has to be given to the calculation of the power distribution in the device with taking into account all the materials and including neutron and gamma deposition. Power in operation and residual heat are in concern."	Some irradiation may use materials non often considered and that may be omitted in neutronics calculations		Particular attention should be given to the calculation of the power distribution in the device, by which all different material compositions and the neutron and gamma deposition have to be taken into account. These calculations should be performed for all operational states.		
5	§ 4.23 p. 19	a) As lead may be used as coolant in some power reactors and so in experimental devices, it cannot be said that lead has to be used with a clad b) Replace " galvanic effects should be considered " by galvanic effects should be considered (in particular with water and alumina) "		Y			
6	§ 5.21 p.25	.Last bullet: replace " that it will not introduce at any stage of the project " by " new hazards introduced by the modification or experiment have to be managed at any stage of the project "	Some large modification may introduce new hazards	Y			
7	§ 6.20 p.31	First bullet: replace "determination (by measurement…) by "determination (if possible by measurement…)	All the reactor characteristics relevant to safety cannot be reached by measurements		determination (by measurement… to the extent possible		
8	§ 9.2 p 9.2	The procedure for transportation of irradiated devices have also to be mentioned		Y			

9		Additional comment: some concrete examples of utilization and modification in RR will be welcome so to illustrate the guide. Examples for France . CABRI reactor: replacement of the sodium cooled experimental loop by a pressurized water cooled experimental loop . PHEBUS reactors: test with fuel melting in the experimental loop					It is recognized that examples of utilization and modification in RR are beneficial for the research reactor community, but practical examples are more subject of a Safety Series report of a Technical Report and not of a Safety Guide
10	Ann II § 3 p. 48	a) The code and standard (ASME, RCC-M, RCC-MR, etc.) applicable to the experimental device are also to be mentioned b) The thermal and mechanical characteristics of irradiated materials have also to be given (they will be used in the § 5.5 to check if the acceptance criteria are met).		Y			
11	Ann II § 5.4 p. 51	The consequences of the use of an experimental device on the core power distribution has to be checked (see § 4.13 p.18)			Y, Is already addressed in 5.4 2nd bullet		
12	Ann II § 10.1 p. 52	a) Categorization of events (normal operation, transient incident, accident) in relation in the experimental device have to be taken into account in the safety analysis b)) Two bullets have to be added: . one in relation with the risk of the reduction of the reactivity control system (i.e. blockage of the control rods due to accident in the experimental device) . one with the means used to remove the decay heat in the in the experimental device			Y, PIE's for the experiment but also for the reactor are introduced in this section. The bullets are implecitely part of the PIEs		

GERMANY

Draft Safety Guide "Safety in the Utilization and Modification of Research Reactors", Version 6, STEP 8, 2010-07-20

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)** (with comments from GRS and AREVA) Page 1 of 10 Country/Organization: **Germany** Date: Nov 12th, 2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General comment		There are many repetitions in the guide; the same items appear in many sections, e.g. 3.14 – 3.18 and 3.23 – 3.26				The repetions are necessary since two different situations are described, major safety significance and significant effect on safety
2	General comment		Many cross references are incorrect.		Has been checked and corrected where necessary		
3	1.8/5	1.8. In the context of this Safety Guide, research reactor utilization is the use of the reactor or of an experiment or an experimental device during reactor operation. The experiment or experimental device may be situated in the reactor core, the reactor reflector, the shielding or the facilities connected to the reactor, but may also be outside the biological shielding or containment ~~**or confinement**~~.	As here it is talked about localities, delete ***or confinement***, because confinement means the safety function of preventing or controlling the release of radioactive material, whereas containment refers to the means of achieving this function (s. IAEA Safety Glossary).		, but may also be outside the biological shielding or containment or confinement outside the reactor building		
4	1.9/3	1.9. In the context of this Safety Guide, a modification is a deliberate change in,	Is a change or addition without potential safety	Y			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		or an addition to, an existing reactor, a reactor system or piece of equipment, an experiment or an experimental device~~, with potential safety implications~~. It may involve modification of safety systems, safety related items, procedures, documentation, or operating conditions for the reactor as well as for experiments.	implication no modification? S. Para/Line No. 3 "Categorization, …": "3.11 … – No effect on safety: modifications or experiments that present no hazard and have no impact on safety. "Therefore delete ***with potential safety implications***.				
5	2.1	The management system should include four functional categories: management responsibility; **process implementation**; **resource management**; ~~**process implementation**~~ and **measurement, assessment and improvement**. Generally: – **Management responsibility** includes providing the means and support needed to achieve the organization's objectives; - **Process implementation** includes those actions and tasks needed to achieve the goals, provide the means to meet all requirements to ensure safety and deliver the products with required quality; – **Resource management** includes	It is better and more logical to use the same sequence. Therefore change the sequence as supposed.	Y			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		measures to ensure that resources essential to the implementation of strategy and the achievement of the organization's objectives are identified and made available; – **Measurement, assessment and improvement** provide an indication of the effectiveness of work performance.					
6	2.6	"…in paras ~~2.30~~ **2.24** and ~~2.31~~ **2.25** of this Safety Guide."	Paras 2.30 and 2.31 do not exist. The responsibilities of the reactor manager are presented in paras 2.24 and 2.25	Y			
7	2.17/2	2.17. Effective implementation of the management system for utilization and modification should be assessed by qualified personnel, who are not **directly** involved in performing these activities. 2.18. The operating organization should evaluate the results of the **independent assessments** and should define and take necessary actions to implement recommendations and suggestions for improvement.	In paragraph 2.18 are mentioned **"independent assessments"**, which refer to paragraph 2.17. Does there exist a reason for using the wording **"… who are not directly involved in …"** instead of **"… who are not involved in …"**? Is there a reason for using the word "directly" in this context, although "independent assessments" are meant?				Especially in smaller organizations specialists are often in some way or another involved in the activities. The personnel should not be involved in the day to day operations of the activities which must be assessed.
8	3.20	~~**3.20**~~	Editorial.	Y			
9	3.22/1	3.22. The safety analysis should cover all foreseeable operational, as well as	Delete the **"s".**	Y			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		accident~~s~~ conditions. The analysis should demonstrate that the license conditions and the original safety limits are not affected and that the radiological consequences of the utilization or modification are within the accepted limits.					
10	3.29/5	3.29. Clear criteria should be defined, which irradiation of large number of samples, (e.g. for isotope production or activation analyses) may be regarded as a repetitive experiment. The irradiation facility and the irradiation position (maximum allowable flux) should be specified. The information and documentation, which should be prepared to support the irradiation request and the *review***,** *and* approval route should also be specified in the procedure. This procedure should be submitted to the safety committee for review.	For a better understanding and reading of the sentence set a comma between ***review*** and ***and***.		the irradiation request, **as well as** the review and approval route		
11	3.5	"…account, see also paras ~~3.22~~ **3.28** ~~3.23~~ **3.29** for repetitive experiments."	Paras 3.22 and 3.23 do not deal with repetitive experiments; the correct paras are 3.28 and 3.29	Y			
12	3.7	"…implication, see paras ~~3.9~~ **3.8** ~~3.25~~ **3.27(or 3.33)**."	Paras 3.9 to 3.25 are not comprehensive, there are more	Y			
13	3.7	"An example of the **content** of a safety analysis report for an experiment is presented in Annex II."	The example is on the content not a safety analysis as such.	Y			

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14	4.1/2	GENERAL CONSIDERATIONS 4.1. The design of an experiment or modification should demonstrate that: – it can fulfill ~~**a necessary**~~ **the** task **for which it is intended**;	Clarification	Y			
15	4.18 / last sentence	„…as discussed in paras ~~4.11~~**4.6** – ~~4.12~~**4.8**or other means, should…"	Paras 4.11 and 4.12 do not deal with shutting down of the reactor	Y			
16	4.22/1	4.22. Selection of materials during the design of experiments should ~~**be**~~ take~~**n**~~ into account material compatibility, corrosion, changing of material properties due to irradiation (e.g. creep, embrittlement, radiolytic decomposition), including transmutation of material, differential thermal expansion, ageing effects and ease of decontamination, dismantling and final disposal aspects.	Grammar: no passive verb form, it is active in this sentence.	Y			
17	4.24/1	4.24. Furthermore, certain **activated** corrosion products (such as silver) tend to plate out on cooling circuit surfaces, thus creating contamination and radiation problems during handling and maintenance.	Clarification: Consistent with DS 388 "Chemistry Programme for Water Cooled Nuclear Power Plants"	Y			
18	5.12	"…such as those given in paras ~~4.19~~**4.20** – ~~4.22~~**4.25**,.."	It is not clear which data are meant		4.17-4.25		
19	5.19		Surveillance requirements should also be determined during the design stage. Commissioning and post-implementation safety		Surveillance requirements have been added to 5.17. Reference 7.6 is changed to 7.5.		

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			evaluation are not a design task. The referred paras 7.2 and 7.6 , which not even exists, are not pertinent				
20	5.28 / penultimate spot	"…if necessary (see para. ~~7.6~~**7.5**).	Para 7.6 does not exist, 7.5 deals with surveillance	Y			
21	5.31	"…as referred to in para. ~~3.13~~**3.xx(?)** should be considered at this stage."	The referred para 3.13 does not deal with formal licensing	Y, 3.19			
22	6.13	"…equipment, see also paras ~~4.24~~ **4.xx** and ~~4.25~~**4.yy**."	Paras 4.24 and 4.25 do not deal with installation of temporary equipment; possibly para 4.28 is meant.	Y			
23	6.16	"…approved and exercised (see para. ~~5.28~~**5.xx**) in cases…"	Para 5.28 does not deal with exercising emergency procedures				8th bullet discusses temporary emergency procedures.
24	7.2		**This para belongs to section 6.** A commissioning report is the completion of any commissioning and the basis for formal approval of commissioning results which is dealt with in para 6.23				The approval of the commissioning results are discussed in 6.23. Normally the final formal report is being prepared during the post implementation

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							phase.
25	7.5	„…during the design stage (see paras ~~5.16~~**5.xx** and ~~5.28~~**5.yy**) should be implemented."	Para 5.16 does not deal with surveillance		Surveillance requirements have been added to 5.16. 5.28 is correct.		
26	9/Heading	9. SAFETY CONSIDERATIONS IN THE HANDLING, DISMANTLING**,** POSTIRRADIATION EXAMINATION AND DISPOSAL OF EXPERIMENTAL DEVICES	Comma missing	Y			
27	10.3/2	a "conventional" safety impact~~,~~ analyses should be performed,	Typing mistake, delete the comma	Y			
28	Annex I		In Annex I **3** Safety Categories are presented. However, para 3.11 introduces **4** categories. Hence, the example of a checklist for categorization does not fit with the safety guide. Annex I needs to be made consistent with the section "Categorization Process" of the guide.	Y			
29	Annex II, 4.4	4.4.1. General • general description of the different groups of instrumentation 4.4.2. Process instrumentation • objective of the process instrumentation • components and diagrams 4.4.3. Operational instrumentation	Add • ***components and diagrams*** like in 4.4.2	Y			

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)** (with comments from GRS and AREVA) Page 1 of 10 Country/Organization: **Germany** Date: Nov 12th, 2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		• objective of the operational instrumentation **• components and diagrams** 4.4.4. Scientific instrumentation • objective of the scientific instrumentation **• components and diagrams**					
30	Annex II, 7.2	7.2. Operational Experience Summarize the relevant operational experience during the execution of comparable irradiation experiments in the past. Aspects to be mentioned are operational behaviour, loading and unloading experience and if applicable ~~**possible**~~ improvements **had been** made.	Correct the grammar of the if-clause as suggested. The word *possible* does not make sense in this context: Either improvements had been made in past experiments and these improvements are applicable to the concerned experiment or there had not been such improvements.		……. unloading experience and **which improvements were implemented or can be introduced**..		
31	Annex II, 9	9. **POST IRRADIATION EXAMINATION** Description (summary) of post irradiation examination (dismantling mode, scientific measurements) of targets and/or the irradiation facility. Indicate if the ~~**PIE**~~ **post irradiation examination** is scheduled to be done at the institute or in another research institute.	According to the IAEA Glossary *PIE* is the abbreviation of *postulated initiating event*. To avoid confusion and misunderstanding, the same abbreviation should not be used for two different terms, especially if both terms are used in the same document.	Y			
32	Annex II Section		The recommended approach for the safety	Y			

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)** (with comments from GRS and AREVA) Page 1 of 10 Country/Organization: **Germany** Date: Nov 12th, 2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	10. Safety Analysis		analysis is not consistent with the state-of-the-art procedure for safety analyses of nuclear installations. For these initiating events are postulated (PIE) and then in the analysis for their mitigation a single failure in the safety systems is assumed. The PIEs are not restricted to the analyzed experimental facility but must include also hazards from other equipment of the reactor, e.g. a heavy load drop on the analyzed experimental facility. Especially for more complex experimental facilities, such as a cold neutron source, the safety analysis should be performed as indicated above.				

INDIA

Safety in the Utilization and Modification of Research Reactors (DS379)

A. General Comments:

- Aspects related to Quality Assurance for the utilization and modification of research reactor may be included as separate chapter or section at appropriate place.

Resolution: In section 2 guidance for the management system is given. In 2.2 there is guidance that processes should be esthablished to cover all the management system aspects, including QA

- Under the heading "SPECIFIC CONSIDERATIONS", following new clause
  - "Power supply and compressed air supply"

    Use of common DC power supply for experiment and reactor system may some time lead to ground fault etc.

  Resolution: This safety guide gives more general guidance than proposed here. This aspect will be discussed in DS 436 Instrumentation and control.

B. Page wise comments:

COMMENTS BY REVIEWER Reviewer: AERB & BARC Country/Organization: India/AERB Date: 10/11/2010				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	5/2.2/first sentence	**Replace 1st sentence by:** As part of the integrated management system, processes for modifications / utilization should be established. This should include approval route before construction, Quality Assurance & testing during construction and approval route before commencement of bringing it to service.	Sentence is complex, broken and modified for clarity	Y			

2.	5/2.3/	- Include 'surveillance requirements'	Surveillance requirement added.		Y, the surveillance requirements should be incorporated. Operating limits and conditions		
3.	6/2.8/5th bullet	- Establishing appropriate **Commissioning** and operating procedures, including those for assessing and correcting non-conforming items;	Commissioning procedure is also required for successful implementation of the project.		Y, already included under bullet 8.		
4.	10/3.6/2	The safety committee may be explicitly specified as plant safety committee	To differentiate between safety committee and reactor safety committee	Y			
5.	Page-11/clause-3.8	**Add:** New experiments **and associated modifications** should be -------- categorization process.	For clarity and completeness.	Y			
6.	13/3.26/1	**Add:** The safety documentation **including 'Emergency Operating Procedures (EOP)'** for the project should be reviewed by the reactor manager,	Due to major modifications safety aspects and accident scenario may get modified.		Y, including new 3.20		
7.	14/3.33/1	**Add:** The **Regulatory Inspection Team**/safety committee should periodically review-----	This comes under scope of Regulatory Inspection Team				3.33 Discusses changes with no effect on safety and of course the regulatory body may review these records but this is not required.
8.	16/4.2/1	**Add:** -in a safe condition preferably without-	Not to limit Experiments				No change is necesarry since it is stated that "Consideration should be given …"
9.	Page-19/clause - 4.21	**Add:** Special precaution should be taken in the design for irradiating material **(including for their enclosures)** that	For clarity	Y			

		can….					
10.	27	**Add:** Designer should carry out hazard analysis at each stage of modification.	To understand probably hazards and control measures in each stage of modification, this clause can be added.	Y			
11.	28/5.28 9th bullet	**Add:** ---**preliminary** decommissioning plan----	Appropriate terms written	Y			
12.	32/7.3/4	**Add:** --project manager/ **Reactor should**--	Appropriate authority written				The preparation of the documentation is the responsibility of the project manager. But approvement of the time schedule by the RM is incorporated.
13.	37/9.6/	The diversity aspects also should be considered.	For clarity				Original text is clear
14.	37/9.8/2	**Add:** ---to the **operating** personnel and---	Appropriate term written	Y			
15.	38/9.9/2	**--training and qualified in----**	Appropriate terms written				qualified expert has a special meaning, see Safety Glossary.

C. Editorial Corrections

Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	6/2.5	**Replace ensure by verify in first line**	Editorial				The management has to ensure. This is stricter than verify.
2.	7/2.10/1	Documents such as the procedures, specifications, **operation procedures** and drawings **for** the utilization and modification **project** should be prepared, reviewed, updated, approved, issued, validated, as required, and	Editorial correction		the procedures, specifications and drawings for the		

Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		archived.			utilization and modification project, **including the operating procedures**, should.		
3.	9/3.1/1	All utilization and modification projects should be **categorized** in order to determine their safety implications.	Editorial correction		Para has been changed based on other comments		
4.	10/3.6 2nd line	**Replace approval** by **acceptance**	Editorial				Here clearly approval is meant.
5.	13/3.20	Clause missing		Y			
6.	19/4.21/1	Special precautions should be taken in the design for irradiating material that can ---------- materials do not endanger the reactor **or** the experiment	Editorial, for correctness	Y			
7.	21/5.1	**--Designer of reactor, if possible. However---**	Editorial	Y			
8.	23/5.7/2	The reasons for modifications and experiments at research reactors may also arise from a variety of considerations	Editorial correction	Y			
9.	19/4.22	**--should take into account-----**	Editorial	Y			
10.	24/5.17	**--project should also be informed to the---**	Editorial				Original text is clearer.
11.	29/6.8/2	Measures should be established for the control of the equipment installation and any potential hazards e.g. radiation, chemical, and industrial.	Editorial correction		Y		
12.	30/6.16/-	Special temporary emergency procedures should be drafted as required, approved and exercised (see para. 5.28) in cases where potentially	Paragraph re-formatted for more clarity. Editorial		Y		

Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		hazardous situations have been identified in connection with the installation of the experiment or the modification at the research facility. These procedures ------ is completed.					
13	33/8.2/3 & 4	In addition to the design, which is backed up by commissioning to minimize these radiological hazards, the experimenters and persons involved in the operation of the experiment should be trained and follow approved procedures for the performance of their tasks.	Paragraph re-formatted for more clarity. Editorial				With the proposed change the emphasis will be given to the back-up by commissioning, instead of that the design should minimize the hazards.
14.	38/10.1	The out-of-reactor core installations include two **groups:** those which utilize the radiation produced by the reactor but **located** outside the reactor (biological) shielding (e.g. a neutron spectrometer) ---------- but which constitute a potential hazard.	Editorial, to march with para10.2	Y			

MOROCCO

Safety in the Utilization and Modification of Research Reactors (DS397)

COMMENTS BY REVIEWER Reviewer: Itimad SOUFI/Abdeljalil JRAUT Page 1 of 2 Country/Organization: Morocco/CNESTEN Date: 09, 24th 2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1.9. (page 3)	It may involve modification of safety systems, safety related items, procedures, documentation of operating limits and conditions for the reactor as well as for experiments.	A modification may concern an operating limit	Y			
2	3.6. (page 10)	The proposal for the classification and categorization of modifications and utilization, including the approval route should be submitted to the safety committee and after approval by the **operating organization** the proposal should be submitted to the regulatory body for review and approval.	The proposal for the classification and categorization should be approved by operating organization before its review and approval by the regulatory body.			N	Conform to NS-R4 it should be the responsibility of the reactor manager to approve modifications or utilization. Other approvals within the Operating Organization should be prescribed in the review and approval route as discussed in para 3.5
3	3.11. (page 11)	- Major safety significance: modifications or ~~**new**~~ experiments,	As this category can involve some other experiments in addition to new ones, the word "**new**" should be deleted.	Y			
4	3.11. (page 11)	- Significant effect on safety: modifications or experiments, which are within the approved licence, safety analysis and safety analysis report but	As operational limits and conditions are included in the safety analysis report and/or in the licence		…….. which are within the approved licence and safety analysis,		

		~~**which requires adaptation of the operational limits and conditions or**~~ which need an adaptation of the safety related operating procedures.	conditions, a modification or utilization that requires adaptation of operational limits and conditions should be classified in the 1st category (Major Safety Significance).		but which requires adaptation of the operational limits and conditions1 and not of the remaining chapters of the safety analyses report, …….		
5	3.11. (page 11)	- Minor effect on safety: modifications or experiments, which are within the approved **Safety Analysis Report** and still having significant margins and no effect on the safety system settings and do not require a change in the safety related operating procedures.	The operational limits and conditions should be replaced by safety analysis report (see comment No. 4).		which are within the approved **licence, safety analysis, safety analyses report**, operational limits and conditions		
6	5.6. (page 23)	Modifications can involve changes to equipment, reactor operating **limits** conditions or procedures.	See comment No. 1.	Y			

[1] Guidance on operational limits and conditions is provided in Ref.[12].

RUSSIA

COMMENTS BY REVIEWER Reviewer: D.N. Palyakov Page 1 of 14 Country/Organization: Russia/SEC NRS Date: 22.11.10				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	2.2.	As part of the integrated management system, processes for modifications and utilization should be established and should include design, review, assessment and approval, fabrication, testing and implementation of the utilization and modification project. The procedures should be put into effect by the operating organization early in the research reactor project. The system should be applied to all structures, system components and processes important to safety and should include means of establishing controls over utilization and modification activities to provide confidence that they are performed safely according to established requirements. The system should also include provisions to ensure that the modification or utilization activities are planned, performed and controlled to ensure effective communication and clear assignment of responsibility. In establishing the system, a graded approach based on the relative importance to nuclear safety of each item or process should be used.	Usage of standard term.	Y			
2	2.14.	The management system on the site should be extended to include suppliers. The operating organization should ensure that the suppliers, manufacturers	License of regulatory body for designing or other services ensures acceptable quality. It is a real practice.			N	Even when a supplier, manufacturer or designer has a license the operating

		and designers have acceptable management system. The operating organization should ensure through audits that they comply with the management systems or have adequate license of regulatory body.					organization should ensure the implementation through audits. Since it is not an IAEA requirement that they have a license from the regulatory body (although they often have a permit or consent from the regulatory body) the proposed adaptation is not included.
3	2.16.	Measures should be established for assessments to determine whether, and for review and verification to ensure that, utilization and modification activities are accomplished as specified during the design. These measures should include: - Review of the design and the design procedures; - Verification of the implementation by audit, inspection and witnessing; - Review and verification of the design, implementation and operation records, results and reports, including those of the status of non-conformance control and corrective actions; - -Follow-up of the adequacy and timeliness of corrective actions.	Inspection and witnessing could be difficult because of the 'know-how' and security problems.	Y	Audits has been added as a separate bullet		
4	2.18.	The operating organization should evaluate the results of the independent assessments and should define and take necessary actions to implement accepted recommendations and suggestions for improvement	Operating organization is responsible for safety and should take decisions.				Proposal is not a clear improvement.
5	2.19.	The operating organization should	Graded approach			N	The present text does

		assign an individual person, normally a dedicated project manager, to be responsible for the implementation of the project objectives through the development of a project definition, adherence to established safety criteria, evaluation of the options and the management of detailed design, project implementation, commissioning and decommissioning, if relevant, in "case of minor or significant (see 3.11) effect of modification and utilization on safety functions the reactor chief engineer is permitted to function as a project manager.	should be used in this sphere too.				not exclude this. Even the reactor manager could/might be assigned as project manager.
6	3.2.	The categorization should provide the basis for the detail and the extent of the safety analysis and the review to be performed. The categorization should also be the basis for the authorization and approval route to be followed for the modification or utilization project. A checklist could facilitate the categorization process. An example of a checklist is given in Annex 1. (The checklist should be accompanied with references to substantiate papers.	Papers used as a basis in the making decision procedure should be known.		All utilization and modification projects should be subjected to **a screening process in order to determine their safety implication and the related safety category of the utilization or modification. The screening process should be documented and the selected safety category should be justified**		
7	3.13.	Changes with major safety significance should be subjected to safety analysis and design, construction and commissioning procedures as applied for the research reactor	Reactor design can be significantly improved.		No change is proposed		
8	3.18.	Modifications and experiments having major safety significance should be	It is reasonable to have one safety committee for a few				The original text does not exclude this, see

		reviewed by the operating organization safety committee and send to the regulatory body for review and approval following the same procedures as applied for the reactor.	reactors if they are located in one site.				also NS-R-4 para 4.15
9	3.20		This point is empty.	Y			
10	3.25.	A list of new or modified safety devices should be included in the safety documentation. Information required for accident evaluation and for mitigation measures under emergency conditions should also be defined.	All modified devices should be included in the safety documentation.	Y			
11	3.26.	The safety documentation for the project should be reviewed and agreed by the reactor manager, with respect to safety, operability and compatibility with other experiments in the reactor and with reactor systems.	The term 'discussed' is not strict in view of result.	Y			
12	3.27.	Modifications and experiments having significance effect on safety should be reviewed by the operating organization safety committee and send to the regulatory body for review and approval following approved procedures.	See 3.18.				See comment of 3.18
13	4.8.	The reactivity worth of an experiment or reactor modification should be determined for all situations (e.g. insertion of the experiment into the reactor core, removal and potential failure modes). A calculated, or otherwise determined, reactivity worth should usually be checked by measurement, using a critical experiment procedure or an equivalent method. The design basis accident for the reactor should also be considered in the evaluation.	Operating limits and conditions can be changed within the modification procedure.	Y	Remark. Can be deleted in 4.8 since the reactivity worth is also discussed in 4.6 and 4.7		
14	4.	Add a new point.	Experimental device can		This point is		

		During installation, loading and other procedures an experimental device should not be critical. Effect of experimental device or modification on control system worth and calibration curve should be estimated.	affect the efficiency of control rods.		already addressed in 4.6		
15	4.19.	In addition to the above considerations irradiation of fissile or moderating material warrants special attention for inadvertent criticality and cooling provisions during and after irradiation to prevent overheating of the target material.	In fast reactors moderators are important.	Y			
16	4.26.	The effect of neutron interaction of an experiment or modified system on core components, fuel or other experiments should be considered. Neutron flux perturbations should be evaluated, especially in the vicinity of safety related devices (e.g. control rods neutron detectors). Where experiments can be inserted, withdrawn or otherwise relocated while the reactor is at power, the effect on the power distribution in fuel assemblies and on the controllability of reactivity changes must be carefully assessed.	See point 4.		No change is proposed.		
17	5.17.	Depending on the safety category of modification or experiment the pre-design appraisal should be discussed with the regulatory body.	Standards and codes can be assessed, reviewed and approved under other regulations and by another bodies.				This is covered by the definition in the IAEA glossary: **regulatory body** 1. An authority or a system of authorities designated by the government of a State as having legal authority for conducting the regulatory *process*, including issuing

							authorizations, and thereby regulating *nuclear*, *radiation*, *radioactive waste* and *transport safety*
18	5.19.	During the design stage the chosen option should be developed into a fully documented and justified design of the modification or experiment. Thus, project plans, specifications, design assessments, safety analyses, detailed drawings for manufacture and the installation of the modification or experiment and all associated documentation should be produced at this stage. These activities are performed under the same regulations as for a new reactor construction. Commissioning, post-implementation safety evaluation and surveillance requirements should also be determined during the design stage (see paras 7.2 and 7.6).	Development of new reactor design and change of license conditions demand usage of the same procedures in some countries.		Already covered in para 3.13 – 3.19		
19	5.21.	Detailed safety analyses should be provided to the extent necessary for the potential hazards. The analyses should determine whether the design will be safe, and in particular showing that: - a new system or component complies with all relevant safety standards and that it will function safely, for all conditions of operation; - new systems will not adversely affect the safety characteristics of other items important to safety under any conditions of operation, or the safety relevant characteristics of the reactor; - an experiment or modification can be carried out without significantly increasing the doses to staff personnel	In the case of major effect, protection against new hazards must be included in the design and safety analysis report.		any new hazards introduced by the modification or experiment can be managed at any stage of the project. The need to include them in the SAR is discussed in 3.11 and 3.13 – 3.19		

		and members of the public; this should be in accordance with the radiation protection optimization principle, or with the risk of an accident; - a modification or experiment can be carried out without adversely affecting the safety of reactor operation and that in the case of new hazards the adequate protection is used.					
20	5.27.	Testing of experimental devices and equipment prior to the installation in the reactor should be considered. Tests should be planned as part of the design of the experiment or modification or within acceptance certification procedure.	More flexible.	Y			
21	6.5.	New components or existing ones that have to be modified are generally fabricated or modified by suppliers in accordance with the detailed specifications that have been established during the design phase. Before selecting a supplier, the operating organization should ensure that the supplier has gained the necessary license or experience for the work and is aware of all particular constraints of the project, including management system criteria (see para. 5.20). Preliminary visits to the supplier are generally indispensable.	Selection and contract are signed by corporate body. In some cases (practices) supplier should have a license.				It is not an IAEA requirement that supplier shall have a license, but the national rules should be obeyed at all times.
22	6.10.	The schedule for the installation of the experiment or for the modification should be agreed by the reactor manager and approved by operating organization to ensure that the reactor is placed in a safe state before	Operating organization is a corporate body, but not a project manager.				The Reactor Manager is responsible as defined in NS-R.4

		commencing the activity.					
23							
24	6.	Add new point 6.24. The changes of design, safety analysis report, license conditions should be approved by the regulatory body with appropriate procedure if it is stipulated.	Commissioning includes startup of the modified reactor (with characteristics beyond the former license conditions). Operating organization should obtain permission of regulatory body before the real startup of the reactor but not after. Startup of modified reactor is more dangerous procedure than post-implementation regular operation.				The approval by the regulatory body is discussed in Section 3.
25	7.3.	The revision of the safety documentation and the safety analysis report mentioned in Section 5.26 should be reviewed and revised as appropriate, to include the as built description of the utilization or modification, taking into account the results of the commissioning process. The reactor manager should be responsible for such revisions.	This documentation concerns normal operation and will be used in normal operation and it is the prerogative of the reactor manager.		The time schedule for the revision of the safety documentation should be approved by the reactor manager. In addition a new 3.28 was added to discuss the operational procedures.		
26	8.6.	Exclude this point.	If information mentioned in this point is needed than the safety was not assessed!				The extend and detail of the documentation for the operation personnel is noramally different than for the SAR and the safety analyses. More practical information should be included here .

27	Annex I	Add "References" to the checklist.	Conclusions of project manager should be made on the basis of known foundations (papers) which should be given in the checklist, or phrase "personal opinion only" should be added.	Y			
28	Annex II	EXAMPLE OF 'THE REQUIREMENTS" TO THE CONTENT OF A SAFETY ANALYSIS REPORT FOR AN EXPERIMENT AT A RESEARCH REACTOR	Example of the content includes requirements really.				It is an example of the content and an annex is not a formal part of the guide.
29	Annex II 4.1.	In-core/out-core irradiation - Functional description of the experimental facility and all in-core and out of core components (e.g. thermocouples, heaters); - Sketches, giving vertical and horizontal cross sections; - Detailed assembly drawing and list of used materials (for including parts list and material specifications reference to the design can be made).	It is duplication of design documentation. This information must be submitted to the reactor manager as design documents.		This example discusses the SAR for an experiment and will also be approved by the RM		
30	Annex II 4.2.	Detailed assembly drawing (including parts list and material specifications).	It is duplication of design documentation.		See resolution 4.1		
31	Annex II 4.2. b	b. A complete description of all joints, penetrations, which are part of the safety containment(s) must be provided.	It is duplication of design documentation.		See resolution 4.1		
32	Annex II	Add point 5.2. e) effect on reactivity worth of control and safety system	It is important for safety parameter.	Y			

COMMENTS BY REVIEWER Reviewer: Page Country/Organization: Rosatom, Russia Date: 20 December 2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Par 3.36	Write paragraph 3.36 as follows: 3.36. The modifications on physical protection, systems may be described in a separate document ~~and should be confidential~~	The basis and recommendations on information security in the area of physical protection are presented in the documents belonging to the IAEA nuclear security series				A reference to the IAEA nuclear security series is already included in 3.33

SWITZERLAND

Draft Safety Guide DS397: Safety in the Utilization and Modification of Research Reactors

COMMENTS BY REVIEWER Reviewer: Dr. J. Hammer Page 1 of 4 Country/Organization: Switzerland / Swiss Federal Nuclear Safety Inspectorate ENSI Date: 25.11.2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	4.11.	The potential for an uncontrolled release of radioactive materials should be limited and the amounts of such material released should be minimized by measures such as the use of delay tanks, filters or recirculation. This applies for all stages of the project, including the installation phase, normal operation, deviations, removal, storage, and shipment of experimental devices or modified systems.	Deviations according INES-Manual must cover this aspect.		"anticipated operational occurrences" is added instead of deviations		
2	5.3. and figure 1	Projects with minor effect on safety should follow the same steps, but with a graded approach, especially regarding the extent and detail of the safety analysis, the documentation to be prepared and the review and approval route to be applied. **For larger projects the approval of the concept by the regulatory body is recommended.**	According to experience of ENSI, an approval of the concept is timesaving and highly recommended. This approval of the conceptual design should also be shown in the figure 1 on page 22 (belonging to conceptual design).		The following guidance was added to 5.17 "Formal assessment and review of the pre-design by the regulatory body and the associated timeschedule should be discussed with the regulatory body in this stage."		

3	8.3.	Every experiment should be performed using approved operating procedures that describe the responsibility of those involved in the experiments and that include operating instructions for them.	Experiment should either be in singular or the activities should be described.	Y			
4	8.5	The areas in which there can be significant radiation fields during reactor operation **and outage**, such as the radiation fields created by open beam tubes, reactor loops or handling of irradiated materials, should be determined before reactor startup. After reactor startup, a radiation survey **(gamma and neutron radiation)** should be made, which covers especially the area of the experiment. The actual radiation fields should be measured, displayed and, when appropriate, recorded. Where necessary, the areas should be cordoned off and appropriate radiation warning signs should be placed.	More details necessary.	Y			
5	8.12a.	**During the running experiment, the experimenter must not be part of the reactor operations crew in charge in order to prevent goal conflicts between the progress of the experiment and safe reactor operation.**	New paragraph dealing with the danger of interferences between safe reactor operation and experiments.		8.13. The operating instructions should clearly define the tasks and responsibilities of the operating staff and of the experimenter to avoid conflicts of interests between the progress of the experiments and safe operation. These responsibilities should be reviewed by the reactor		

					safety committee and approved by the reactor manager.and approved.		
6	8.14.	The reactor manager has direct responsibility for the safety of the reactor operation. Accordingly, the reactor manager or a designated member of the manager's staff should have the authority to control any necessary operation of the experimental equipment to ensure the safety of the reactor and the personnel, including stoppage transfer into a safe condition of any experiment which the manager considers hazardous.	Stoppage is not enough. The system must be transferred into a safe condition.	Y			
7	9.8.	All documentation describing the sequence of operations and the instructions for operating the equipment should be known to the personnel and should be available throughout the time of handling, dismantling, post-irradiation examination and storage of irradiated elements, **components, and devices** until disposal.	The word "elements" alone is not clear enough and can be misinterpreted.	Y			
8	10.1	The group of out-of-reactor core installations includes two categories: those which utilize the radiation produced by the reactor but which are outside the reactor (biological) shielding (e.g. a neutron spectrometer), and those which are at or near the reactor and which do not utilize the radiation produced by the reactor, but which constitute a potential hazard (e.g. a cryostat ~~for the generation of~~ **containing** liquid nitrogen).	A cryostat will not generate liquid nitrogen.	Y			
9	Annex II 4.4.6.	**Safety relevant** instrumentation not covered by the previous categories	This instrumentation is only interesting when safety is				The safety instrumentation is

			relevant.				described in new 4.4.2 (old 4.4.5)
10	Annex II 4.6.3.	Each description should indicate anticipated (power, water, air, helium, **etc.**) consumption rate.	This is a non-exhaustive enumeration.	Y			
11	Annex II Remark to 5.4	All calculations are to be made for nominal reactor power and cooling conditions as well as for design basis accident and reactor shutdown conditions.	It is not only for an accident but for an design basis accident.		Accident conditions includes design base accidents, see the IAEA safety glossary, but normal reactor power has been changed into operational states to include anticipated operational conditions.		

UKRAINE

TITLE
"Safety in the Utilization and Modification of Research Reactors"

COMMENTS BY REVIEWER Reviewer: O. Dybach Page Country/Organization: Ukraine/SSTC NRS Date: 04.10.2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	Para 3.11	Add new text: "No effect on safety: modifications or experiments that present no hazard and have no impact on safety **even if designed or implemented incorrectly**."	Specification of the definition.		Y, is now addressed in the main text of 3.11		
2.	Para 3.30	Add new text: "Record of experiments and minor modification approved by the reactor manager should be periodically reviewed by the safety committee to ensure that there are no disagreements in the interpretation of the criteria for approval. **Modifications in this category should be reported be reported to the regulatory body if required.**"	Changes with minor safety significances should be reported to the regulatory body on request or periodically as minimum for informing.				Modifications with minor safety significance do not nessecarly be reported to the regulator seperately, but the review and approval procedure should be approved by the Regulatory Body. So if required in a MS this could be addressed in the dedicated procedure.
3.	Para 2.8	Add new - quality assurance program	Specification of the definition.				Whole section 2 gives guidance on Management System aspects.
4.	Para 3.20	Delete para 3.20	This section contains no information.	Y			

COMMENTS BY REVIEWER Reviewer: Tonkykh V. Page Country/Organization: Ukraine/SSTC NRS Slavutich Office Date: 29 Oct 2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
5.	3.17 and 3.26		Paragraphs repeat each other.				They are discussing different safety categories.
6	3.18 and 3.27		Paragraphs repeat each other.				They are discussing different safety categories.
7	8.13 Lines 4,5	Such proposed changes should be treated as modifications, implementation of experiment needs to be stopped, and the guidance given in this Safety Guide should be followed.	Consideration of changes in an experiment it is necessary to conduct with the observance of all of requirements of the real guidance at the stable state of reactor.	Y			No modification was necesarry since this guidance says that all aspects should be considered.

COMMENTS BY REVIEWER Reviewer: K. Arhangelskry Page Country/Organization: Ukraine/SSTC NRS Date: 29 Oct 2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
8	Para 3.11 Page 11	Categorization process of utilization or modification project related to safely is based generally on criterion of compliance with license conditions. It is proposed to supplement categorization process with examples explaining substance of utilization or modification. E.g. “Modification could affect the design, function design changes in systems, structures and components, changes in configurations	To clarify categorization process of utilization project related to safety.		Definition of 1.9 has been adapted: “a modification is a deliberate change[2] in, or an addition to, an existing reactor, a reactor structure, system or component,		

[2] Experiments and experimental facilities which have been approved over time or which have been analysed as a part of the safety analysis report are not considered as a deliberate change under the present Safety Guide.

		of safety related systems or in its performances, changes in software providing proper plant operation etc.”.			software important to safety, an experiment or an experimental device”		
9	Para 2.24 Page 9 and further	The term “reactor safety committee” is used in document more than one. It is advisable to explain origination of that body, its authorities and functions.	To clarify terms used in document draft.				The requirements for a safety commttee and the responsibilities are given in NS-R.4 (starting at 4.15) and are normally not repeated in a safety guide.
10	Para 5.5 Fig. 1 Stages of a modificatio n or utilization project with major safety implications	Mentioned figure 1 does not contain information of the following aspects of implementation of modification/utilization project: Regulatory body actions related to approval of conceptual design, testing of modification/utilization subjects (equipment etc.) before operation and approval of its results by regulatory body.	To clarify aspects of implementation of modification/utilization project.				In this guide no guidance for the regulatory body is given. 5.17 gives guidance to the operator that he should discuss formal review and approval of the pre-design. This is represented in figure 1. The other approvals are clearly discussed in the text and presented in fig.1

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Diakov Oleksii Page Country/Organization: Ukraine/KINR Date: 05.09.2010							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
11	4.6.	If the experimental device or a modified system, or its failure, can lead to an increase in the reactivity of the reactor to a value greater than 0.3 β_{eff}	Any experimental device or a modified system effects on a reactivity of the reactor, it should be a limit				No specific data is presented in safety guides. The reactivity effects which can be

		with the speed more than 0.07 β_{eff}/sec. the experimental de vice…	that normally established in the country safety rules. Basically any reactivity less than 0.3 β_{eff} can be safely accommodated by the reactor control and protection system and does not produce sufficient impact on change of the reactor power change speed. So it probably no needs to take such impact into consideration. The same reasons for the speed of reactivity changes				accommodated safely should be presented in the SAR and approved by the regulatory body.

UNITED KINGDOM

DS 397 Safety in the Utilization and Modification of Research Reactors (Draft 6, 20-07-2010)
FOR OFFICIAL MEMBER STATES COMMENTS

COMMENTS BY REVIEWER Reviewer: Country/Organisation: UK Member States comments DS 397 Date: 2 December 2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General		On the whole this draft safety standard is well written and considered and the UK supports its progress. We have provided a number of comments, mainly for completeness and clarity.				
2	Para 1.3, 2nd sentence	Modify to read: "These characteristics include the large variety of designs, the wide range of **reactor** power **outputs**, the different…."	The current wording appears to be ambiguous. Reword as suggested for clarity.	Y			
3	Para 1.5, 1st sentence	Reorder the text to read: "…can be implemented without undue risks to **the public, the environment, and site personnel.**"	In such a document, it is better for the facility to prioritize risks to the public first.	Y			
4	Para 1.6 et seq	Modify to read: "This Safety Guide gives guidance to the operating organization, including **those undertaking modifications and testing**, and technical support organizations and …"	The use of the word "experimenters" could be taken to refer to those tinkering with equipment, especially as these documents are widely available via the internet. Reword as suggested to improve clarity, here and throughout the draft.		external users of a utilization provision (e.g.experimen-ters)		
5	Para 2.8,	Add a new bullet to read:	Identifying ongoing	Y			

COMMENTS BY REVIEWER Reviewer: Country/Organisation: UK Member States comments DS 397 Date: 2 December 2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	Line 4	"**Addressing the maintenance requirements for the modified or new equipment which forms part of the research reactor;**"	maintenance (inspection and test) requirements is an important safety requirement for modified or new plant to ensure that the safety function is not impaired during normal operation. This does not appear to be the same as the requirement in Para 2.15.				
6	Para 2.15	Modify to read: "…a safe manner and to ensure that the requirements can be met should be determined, provided, **verified/substantiated** and maintained."	It is important that software, etc should be shown to be operational before use on the plant or plant start-up.	Y			
7	Para 2.16, 1st sentence		This sentence needs rewording to improve clarification for the reader.	Y			
8	Para 3.4	Add a new bullet point to read: "**Potential to lead to a significant off-site dose to members of the public;**"	Dose rates to the workers/contractors on the site may be acceptable during the modification phase and subsequent operations. Allowable doses to members of the public at the site boundary are significantly lower.	Y			
9	Para 3.20		Typo – missing paragraph? There is a paragraph number but no text.	Y			
10	Para 3.27	Modify to read:	Correct grammar.	Y			

COMMENTS BY REVIEWER Reviewer: Country/Organisation: UK Member States comments DS 397 Date: 2 December 2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		"Modifications and experiments having **significant effects** on safety should be…"					
11	Para 3.29, 1st sentence		This sentence should be rewritten to avoid ambiguity.	Y			
12	Para 3.34	Add new text to read: "…given in the IAEA Nuclear Security Series[13] **and guidance from the relevant security authorities of the country in which the facility is located.**"	For completeness.	Y			
13	Para 4.20		Query: would low pressure also pose a problem, for example reverse flow (or low flow rates) of ventilation systems?	Y			
14	Para 4.22, 1st sentence	Replace "be taken" with "take" to read: "Selection of materials during the design of experiments should **take** into account…."	Correct grammar.	Y			
15	Para 4.28	Add a new sentence to read: "…e.g. anchoring them adequately, fire protection, etc. **Also permanent plant and equipment need to be protected against hazards caused by the temporary equipment, e.g. construction cranes toppling over.**"	For completeness.	Y			
16	Para 5.1, 6th sentence	Replace "to where" with "if" to read: "For the design of a modification the operating organisation should consult the designer **if** possible."	Correct grammar.		To the extent possible		
17	Para 5.4, 2nd	Modify to read:	Formal records should be	Y			

COMMENTS BY REVIEWER Reviewer: Country/Organisation: UK Member States comments DS 397 Date: 2 December 2010				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	sentence	"In particular, the transition points between stages should be formally acknowledged **and recorded**."	kept of phase changes.				
18	Para 5.5	Modify to read: "…operating procedures, operator training, **spatial considerations**, or to ensure the feasibility…."	To ensure that workability within the space confines can be assured, e.g. construction/ dismantling can be achieved in the space available.	Y			
19	Para 5.6, 1st sentence	Replace "experimenters" to read: "…such as the reactor management, the regulatory body, **those undertaking modifications and testing**, and equipment suppliers."	See Comment 4.		external users (experimenters)		
20	Para 5.6, 4th sentence	Replace "experimenters" to read: "….safety committee, **those undertaking modifications** and testing, equipment suppliers and independent consultants."	See Comment 4.		external users (experimenters)		
21	Para 5.13, 3rd sentence	Modify to read: "…and maintenance history of this equipment to ensure that the documentation is up-to-date**, and that the existing equipment is capable of supporting the intended operations.**"	This includes the effects of ageing, potentially increased demands on the equipment, etc.	Y			
22	Para 5.16, last sentence	Modify to read: "A review scheme for comparisons between the available options and for the selection of the optimum solution should be provided **and recorded. Reasons for the rejection of the other solutions should also be recorded.**"	This is to enable a record of the decision-making process to be made.	Y			
23	Para 6.11	Consider adding a new bullet: "**Confirmation that no 'contraband'**	This is to ensure that assembly/fabrication staff	Y			

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		materials, e.g. assembly/installation tools and equipment, have been inside the nuclear boundary for the modification."	are fully aware of and avoid the potential to "import" such material over the boundary.				

UNITED STATES OF AMERICA

Comments on IAEA Draft Safety Guide "Safety in the Utilization and Modification of Research Reactors" (DS397)

COMMENTS BY REVIEWER Reviewer: United States of America Country/Organization: United States of America Date: November 2010				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	New section after 1.12	Add to Scope Section: (Text taken from DS424 "Scope Section") Fundamentals Safety Principles [1] states that: "Safety measures and security measures have in common the aim of protecting human life and health and the environment." This Safety Guide does not address nuclear security considerations and the actions that need to be taken to incorporate security elements progressively into an effective nuclear security regime for a nuclear power program. Considerations of nuclear security matters are covered in IAEA Nuclear Security Series publications. Specific recommendations on security for nuclear power plants are provided in The Physical Protection of Nuclear Material and Nuclear Facilities (in preparation) Implementing Guides are issued in the Nuclear Security	Consistency, clarity	Y			

COMMENTS BY REVIEWER Reviewer: United States of America Country/Organization: United States of America Date: November 2010				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		Series. The scope of this Safety Guide includes consideration of the interface between nuclear safety and nuclear security. Further information on this issue can be found in the INSAG-24 report on the Relationship between Safety and Security in Nuclear Installations.					
2	New section in Scope	Use same footnote from 3.34 and 3.35 (footnote 13- IAEA Nuclear Security Series) for this section.	Consistency		"Interface Between Safety and Security in Nuclear Power Plants; INSAG 24" has been added as footnote and the paras 3.34 and 3.35 has been referred to.		
3	1.11	Use same footnote from 3.34 and 3.35 (footnote 13- IAEA Nuclear Security Series) for this section	Consistency				The footnote here is not essential here.
4	2.1	Use same footnote from 3.34 and 3.35 (footnote 13- IAEA Nuclear Security Series) for this section	Consistency				Footnote 6 seems to be sufficient regarding management systems.

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Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
5	3.36	Use same footnote from 3.34 and 3.35 (footnote 13- IAEA Nuclear Security Series) for this section	Consistency				Repetition of the footnote is not necesarry.
6	5.21/2	The analyses should ~~determine whether the design will be safe~~ demonstrate that the design is safe, and in particular show ~~showing~~ that:	The phrase "The analyses should determine whether the design will be safe..." implies that it is acceptable to proceed to the implementation phase of a modification or experiment if the safety analyses show that the design is unsafe.	Y			
7	6.20/8	"Verification (on the basis of measured data) ~~of the relevant safety constraints~~ of proper operation of related safety systems	It is unclear what "safety constraints," means. Does this mean testing the related safety systems to verify proper operation as part of commissioning the modification or experiment? If the proposed new text is not consistent with the intent of this item, consider revising the language to be more specific about what the "safety constraints" are and what "verification" entails and/or accomplishes.		of the relevant safety constraints and proper operation of all safety function;		
8	8.5/5-7	Where necessary, the areas should be	Depending on the extent of	Y			

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		cordoned off ~~and appropriate radiation warning signs should be placed~~ or physically secured to prevent inadvertent or unauthorized access, and appropriate radiation warning signs should be conspicuously placed.	the radiation hazard, it may be prudent to prevent access to experiment areas by physical means such as locks or barriers. The term "cordoned off" implies the use of ropes or other means of delineating radiation areas that may be easily or inadvertently circumvented.				
9	8.11/8	The need to announce through a public address system that the reactor is starting up or that the experiment will commence.	Depending on the nature of the experiment and potential hazards related to its performance, it may be prudent to make it generally known that an experiment will be performed.	Y			
10	Annex II, Section 10.2	General Comment: Revise the section for clarity and to eliminate the term "double failure."	The intent of this section is unclear. It seems that the intent is to perform a bounding analysis of the consequences of an experiment failure to demonstrate that an experiment failure is less severe than a reactor accident. However, the term "double failure" is inconsistent with the		Section 10.1 has been extended by which the safety analyses should be based on postulated initiating events, which is consistent with the rest of the guide and		

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			assumptions for reactor accidents. Specifically, NS-R-4, Section 7.88 states that experiments having major safety significance are subject to safety analyses equivalent to those for the reactor itself. Since reactor safety analyses do not include the “double failure” concept described in Section 10.2, DS397 should be revised to be consistent with other IAEA research reactor safety guides.		other sagfety standards. Section 10.2 of annex II has been deleted.		