Commissioning for Nuclear Power Plants (DS446)

COMMENTS BY REVIEWER Reviewer: **Argentina** Page.... of.... Country/Organization: Autoridad Regulatoria Nuclear Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1		General comment: It will be useful to use only one of the equivalent terms: "operating organization" or "licensee".-	Considering that the terms "operating organization" and "licensee" are equivalent, it is recommended to use only one of such terms. Better understanding	A	Has been incorporated by replacing licensee with operating organization		
2	Item 2.3 /. page 6	Add new paragraph: • Verify that SSCs fulfil the design safety objectives through the corresponding acceptance criteria.	Better understanding	A			
3	Item 2.8 /. page 7, para. 4.	The programme should include hold points in the commissioning process;	Better understanding	A	The appropriate hold points are established for the commissioning process		

4	Item 2.10/. page 7, para.1.	- The points at which reviews, hold points and milestones are required to check the compliance to safety requirements and receive authorization for proceeding from the regulatory body.	Better understanding	A			
5	Item 2.10/. page 7.	Add new paragraph: - The acceptance criteria for each test.	Better understanding			R	Correct, but not in this para.
6	Item 2.10/. page 7, para. 5.	—foresee the means for data collection for further use;	The commissioning programme has to foresee the means, not make provisions for.	A			

7	Item 2.16/. page 8, para. 5.	The commissioning programme of a nuclear power plant should be divided into stages whose number and size will depend upon safety requirements and technical and administrative requirements. A review of the stage test results should be completed before continuing to the next stage. The review should enable a judgment to be made on whether the commissioning programme should ~~continue to the next stage, and~~ whether the succeeding stages should be modified as a consequence of the test results or because some tests in the stage had not been undertaken or had not been completed. (The Annex provides a typical list of tests to be considered in developing the commissioning programme). All the tests belonging to each commissioning programme stage must be successfully completed as a requisite to continue to the next stage. Besides, in the safety systems case the regulatory body has to authorize to continue to the next stage.	Better understanding			R	Does not aid understanding

8	Item 2.19/. page 9, para. 5.	The sequence of tests within each sub stage should be given in the order in which they are expected to be performed. Adjustment in the test sequence can be performed according to test progress, test results or external conditions such as grid availability, need of periodic tests or maintenance activities performance. These adjustments require respect of safety conditions and a common agreement of all involved parties: commissioning organization; operation organization; regulatory body, etc.	Better understanding	A			Accepted
9	Item 2.30/. page 10,.	The regulatory body during the implementation commissioning program at predefined hold points or milestones, based on the evaluation of test results, appropriate reports prepared by the licensee and onsite inspection activity, should approve whether the licensee may proceed to subsequent stage/sub stage of the commissioning program.	Better understanding	A			Accepted

10	Item 2.32/. page 10,.	Appropriate organizational arrangements should be established to ensure that the operating organization can correctly and effectively discharge its responsibility considering that it can be delegated but the ultimate responsibility always remains in the operating organization as license holder.	Better understanding			R	See 2.31
11	Item 3.5/. page 11,.	Systems, structures and components ~~are classified during design phase~~ based on their importance to safety. This importance to safety can provide a basis for determining commissioning requirements, methods, testing, inspections, reviews, qualification of personnel and record requirements.	Better understanding	A			See France comments for proposed amendment

12	Item 3.10/. page 12,.	Appropriate procedures should be established by the licensee for performance and the control of commissioning activities at the site to ensure that the commissioning of the plant fulfils the quality provisions of commissioning programme. Arrangements should be made to ensure that these procedures are reviewed and approved before issue ~~and that their subsequent amendment~~ is controlled.	Better understanding	A			See France comments
13	Item 3.15/. page 13,.	The working arrangements should make use of the operating personnel so that they become familiar with the plant and the facilities during commissioning. In addition, the operating group should participate in the commissioning activities from the start of the commissioning process in order to ensure that as many operating personnel as possible gain field experience and to establish an 'institutional memory' of the plant that must be suitably documented.	Better understanding			R	Proposal is confusing

14	Item 3.17/. page 14,. para. 2	- the operating group should operate systems and plant as stated in the commissioning programme, respecting the operating limits and conditions, and since the start of nuclear testing respecting the operating technical specifications;	Better understanding	A	Refer to limits and conditions (not Tech Specs)		
15	Item 3.32/. page 19,	Add new paragraph (commissioning group): - to ensure that the safety-related test results have been approved by the regulatory body.	Better understanding	A			
16	Item 3.43/. page 21,	Specific attention should be paid to systems which have been partially installed and, as a consequence, have only been partially commissioned.	The eliminated paragraph contradicts what was indicated in the previous one.	A	Change to order of the two sentences in para 3.43		Accepted
17	Item 3.44/. page 21,. para. 3	procedures for transferring systems for operation";	Usually, only systems are transferred for operation.			R	Some states transfer at different levels

18	emergency arrangements : page 28	Add the following new item between 3.75 and 3.76: The regulatory body has to approve the organizational plan to manage emergencies in the commissioning phase.	Better understanding			R	Not appropriate for a guide
19	emergency arrangements : page 28	Add the following new item between 3.78 and 3.79: The Regulatory Body has to examine that the personnel involved in the commissioning phase are suitably trained to cope with an eventual emergency occurrence.	Better understanding			R	Not appropriate for a guide Depends on national arrangements
20	Item 4.5 f. page 29,	The commissioning process should be documented in compliance with the licensee management system. The documentation showing the testing and results, analysis, deviations and dispositions should be kept by the licensee or the design authority for the lifecycle of the NPP.	Better understanding	A	Remove reference to design authority		Responsibility of Operating Organization

21	Handlings of deviations, page 42,	Add the following new item between 4.72 and 4.73: Modifications to safety related SSCs or plant procedures must be approved by the regulatory body prior to be performed.	Better understanding			R	Not suitable for the guide
22	Item 4.74 /. page 43,	If there is a need to change the sequence of a test, an appropriate review should be performed prior to varying the sequence of the test from the intended programme. The review should ensure that all the prerequisites for the out of sequence test are met in order to ensure the safe performance of the test. In the case that the above-mentioned test belongs to safety related SSCs, the change must be approved by the regulatory body	Better understanding			R	Not suitable for the guide
23	Item 4.78 /. page 43,	Add new paragraph: - In the case that the above-mentioned test belongs to safety related SSCs, the corrective actions decided must be approved by the regulatory body	Better understanding			R	Guide cannot specify what should be approved by regulating body.

Commissioning for Nuclear Power Plants (DS446)

COMMENTS BY REVIEWER Reviewer: Dept of Energy Page..1.. of.... Country/Organization: South Africa Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	2.2 General		Regulatory and Local Authorities should be included in the list	A	Regulators		
2	2.3 General	When accident design requirements are identified, they should be tested in so far as possible. If they cannot be tested, then justification should be provided. Typically the justification should include compensatory measures .	Prototypes/Dry runs and modelling techniques could serve as compensatory measures for cost effectiveness and related aspects such as safety.			R	Does not give more clarity
3	2.3 General	It is proposed to add an Annex that	At this guidance document level, one			R	This is not

		lists examples of typical design requirements as described in the safety analysis report and the licence conditions and which are of relevance to commissioning.	expects more specific information than mere reference to 'design requirements' in general. It would also improve Clarity of interface of commissioning with SAR and licence conditions.				adequate for this guide. See Guides related to design.
4	2.3 General	For the achievement of future safe and reliable operation of the plant, the commissioning process should be able to	To complete the sentence for clarity	A			
5	2.3 General	Remove the word 'to' at the beginning of each bullet	To correct the grammar when read together with the preceding bullets.	A	Changed		
6	2.3 General	Include-the testing-of in-service testing procedures and hardware.		A			
7	2.5 General	Rewrite the whole paragraph.	The text does not express the concept clearly and coherently. The on-site and offsite commissioning tests should correspond guarantee adequate balance of plant among structures, systems and components (SSC). A commissioning programme must have a fully comprehensive commissioning schedule. This schedule should highlight all resource allocations per				

			activity (These should include responsibilities per organisation, reporting hierarchies, milestones, dependencies and holding points).				
8	2.6/3-5	Non-nuclear include: testing, which -Individual pre-operational tests of components and systems (as-built performance); -Overall preoperational tests systems tests (as-built performance).	It is not clear whether commissioning in this regard refers to testing the as-built performance of SSC or during laboratory tests (e.g. shake table tests) or both.			R	It is clear from the text
9	2.8	Add the following text at the end of the first bullet of 2.8: '(The Annex provides a typical list of tests to be considered in developing commissioning programme.)'	When reading this first bullet, the tests referred to could mean so many things. By referring the reader to the Annex for examples will enhance readability of this document, otherwise the reader is kept wondering until he/she comes across the first reference	A			

			to the Annex only later in the narrow context of commissioning stages in 2.16				
10	2.8 Last bullet	Delete the word 'whose' from the last bullet	To correct the grammar of the sentence	A			
11	2.8 General		The review and approval of a comprehensive and all inclusive commissioning programme- is the responsibility of the NNP operating Organisation with the approval of the • Regulatory Authorities • Local Authorities • The network operator			R	This para. does not say about approval
12	2.10 First bullet	Delete the first bullet	It is unnecessary cumbersome duplication of the text which is already covered by the third last and last bullets of 2.8.	A			
13	2.10 General					R	

			The commissioning programme should include important milestones such as : • Hold and review points - these are required to check deviations from the safety requirements and verify compliance to safety, specification, schedule local authority, regulatory and network operator's requirements. •Local Authorities And • The Network Operator Each activity on the commissioning schedule should have a unique identifier.				This is already mentioned in 2.8
14	2.11 General		The commissioning programme should accommodate tests and test results acquisition and documentation by respective technical personnel.			R	To specific
15	2.8 Line 1	...of commissioning practices in Member States,	The use of 'Member States' and not just 'States' should be used consistently through the document (See para 3.14 line 3).	A			

16	2.18	On the basis of the board range of commissioning practices in States, the commissioning process can be divided into the following stages and sub-stages:	Should it not refer to countries/national practices?			R	
17	2.25 General		A commissioning programme should have as its subdivision specific commissioning procedures. Each procedure must describe the-principlesf objectives and nature of the tests. They should the criteria for judging the validity of the results and acceptance criteria.			R	Does not give more clarity
18	2.27, Line. 2	a. Separate commissioning programmes...	The plural is implied	A			
19	2.27, Ьте 3 "	b. If some of the SSC...	Structures, systems and components" "(SSCJ was first abbreviated in page 6, para 2.5, line 3	A			
20	2-3, Whole Paragraph	Rewrite this paragraph	The text does not express the concept clearly and coherently.	A			

21	3.4 Line 4	Elaborate the meaning of 'graded approach' in this context	In a guidance document one would expect guidance on what is meant by a graded approach.			R	Too specific
22	3.9 Line 4	Replace the word 'organization' with 'organisations'.	Editorial	A			
23	3.15 General	The functions and responsibilities of the following as far as commissioning is concerned should be defined: • The Regulatory Authority • The Local Authority • The Network Operator				R	To specific
24	3.28 General	Responsibilities of the commissioning group should include the following: Ensure that the design assessed and authorized by the regulatory organization, implemented and re-tested when design criteria are not met or fall short.				R	To specific
25	3.29 Line 1	Handover should be_ differentiated from turnover	The plant is normally handed over in total from the vendor to the customer at the end of the contract The gradual 'turnover' of SSC implies that the customer will operate the plant on behalf of the			R	

			vendor. The responsibility for the plant resting with the vendor until handover.				
26	3.33 General	Responsibilities of the operating group should include the following: • Liaise with relevant local and regulatory authorities and network operator during commissioning of NPP in anticipation of operational transients disruptions and NNP can experience during hot commissioning.				R	To specific
27	3.33, bullet 4	To increase **competency...**	Grammar	A			
28	3.48	-Interface with the regulatory body.. • During commissioning, the engineering function of the regulatory body should be part of the commissioning process to understand and validate the commissioning results so that an infomed verification of the commissioning activities can be assured. The regulatory organisation engineering				R	To specific

		function should be represented in all commissioning meetings and forums.					
29	3.50	Before licensing and authorization for routine operation at full power, the regulatory body should complete the review and assessment of: • The updated as built changes to the plant that took place during commissioning (additional).		A			
30	3.55	The following documentation should be included in the acceptance package for each system. • Maintenance philosophy instruction and procedure document (additional)		A			
31	3.60 Line 2	...the amount of desalinated water used for flushing	Grammar	A		R	Do not appropriate in this para
32	3.67 General	Management systems should include requirements for receipt inspection. The inspection/testing of SSC on arrival ensure SSC is					

		adequate.					
33	3.80	The standard repeat similar issue in different places in the document, e.g. management of unexpected events is discussed in section 3.80 and then the Handling of Deviations is discussed from 4.70 to 4.78.				R	Text says about different stuff.
34	4.4 General	The relationship between factory testing, preoperational and operational testing is not addressed. Include factory testing in the commissioning process.				R	Too specific for Guide
35	4.12	Insert the word 'to' before the 'words be verified' in the first line of 4.12.	To correct the grammar ofthe sentence.	A			
36	4.12	A list of acceptance criteria that are to be verified should also include the list of acceptance criteria that will have to be changed because they could not be met where practically possible. A process to review and authorize this changed acceptance criteria should be put in place.		A			

37	4.16	After the words 'normal plant operating procedures', add the words 'covering the operating configurations (normal transient and accident conditions)'	Otherwise the sentence may be interpreted as referring to only normal operation. Adding the proposed words makes 4.16 more explicitly consistent with 2.25	A			
38	4.17	The complexity of computer codes and testing should be more comprehensively addressed. Computer code assumptions should be understood and their confirmation incorporated into the test programme. There should be feedback between the computer analysis and the test programme.				R	Too specific for tis guide
39	4.19c, Line 1	Limiting **criteria** and conditions or **operational** limits and conditions	This title is not complete	A			
40	4.19	• Although the format of the procedures may vary from plant to plant, the contents of test procedures should include, but not limited to the following: -O. Authorizations and Acceptance (all test procedures need to be accepted by the relevant authorities and organizations, e.g. network operator, regulatory bodies' engineering functions and local				R	The para says about content of the procedures. Authorization and acceptance relate to different subject.

		authorities.)					
41	4.25 General	Further explanation should be included for the determination of test requirements from the functional analysis. SSC and groups of systems have functions. During design, the safety and non-safety functions of SSC and groups of SSC should be identified.				R	Not appropriate for this Guide. Design specifics in the separate Guide.
42	4.25 Last Bullet	...specific conditions and requests...	Plural	A		R	Do not provide clarity
43	4.28	Sequence of commissioning tests should be planned in natural and chronological order in which they are expected to be performed, and that the system required ensuring the nuclear safety of commissioning stage should be adequately tested prior to other systems so that they are available for proper testing of other systems.				R	To specific
44	4.35 General		Some examples of the testing would be informative, e.g. loss of 125 volt dc Train A; as well as reference to the				

			validation of the Operating Incident Procedures.				
45	4.70	During commissioning, changes to the plant design, programmes or tests may be necessary. Unexpected results may be obtained and incidents may occur. The operating organisation should establish a process and procedures for dealing with the framework of its management system. The operating organisation must consult and seek approval of the regulatory authority for changes that have to be accepted as a norm and follow the modification implementation process used within its management framework				R	Do not provide clarity
46	5.8	Change management process for deviations detected during commissioning.	A			R	Depends on MS approaches
47	5.10,11, 12	The system commissioning programme should be re-phrased to system commissioning procedure or plan. The Stage Commissioning Programme should also be a procedure or a					

		plan.				A	
48	5.15 Line 6	The detailed content of the test procedures are in paragraphs...	Complete this sentence				
49	5.15	In addition to detailed step-by-step procedure, they should contain specific infonnation about safety requirements; emergency procedures test data collection and its acceptance criteria.				A	
50	5.19 Line5	Completion **<u>of</u>** the test…..	Grammar			A	
51	Annex/sub headings	Describe the distinction between the subheadings 'PRE-REQUISITES FOR PRE-OPERATIONAL TEST AND PRE-OPERATIONAL TESTS	For example, both A.2(a) under 'PRE-REQUISITES FOR PRE-OPERATIONAL TEST' and A.3(b) under 'PREOPERATIONAL TESTS' refer to tests of safety valves. Clarify the corresponding difference of the nature of testing of the same component under the different subheadings.			R	
52	A.3(b) 5th bullet	Replace 'safety valves' with 'relief and safety valves'.	To make it consistent with item A.2(a).			A	

53	A.8/6th last bullet	Clarify meaning of 'if necessary'.	Improved readability.			A	
54	A.9(e)	Replace the text 'under transient and steady state conditions' with 'under transient, steady state and accident conditions'.	To make A.9(e) consistent with 2.25.			A	
55	A.19(e)	Delete the text 'paras 5.34-5.47 and'.	These paragraphs do not exist in the document			A	
56	References on p.68	Consider adding references to IAEA-TECDOC-1390 'Construction and commissioning experience of evolutionary water cooled nuclear power plants'(2004) and to Technical Report Series NG-T-2.2 'Commissioning of NPPs: Training and Human Resource considerations, (2008).'	They are also IAEA documents related to commissioning. The reader should be made aware of their existence			R	
57	References	a. There is no reference [4] b. Reference [5] does not appear in the text of the document although Safety Culture is addressed in several places, c. Reference [6] does not appear in the text ofthe document	References should be addressed in the text of the document.			A	

58	Glossary	There is no glossary of terms in the document	A glossary of terms should be included to define the terminology used in the document			R	

«Commissioning for Nuclear Power Plants» (DS 446)

COMMENTS BY REVIEWER Reviewer: Date: 20/02/2012 Country/Organization: Russian Federation/ State Atomic Energy Corporation; Scientific and Engineering Center for Nuclear and Radiation Safety				**RESOLUTION**			
Comment No	**Para/Line No**	**Proposed new text**	**Reason**	**Accepted**	**Accepted, but modified as follows**	**Rejected**	**Reason for modification/ rejection**
1	Whole document	To avoid ambiguity of the term "Commissioning programme"	Ambiguous meaning of the term "programme" over the text. In some cases it means a commissioning process, while in others – a document regulating the process			R	Continuity with the original guideline
2	1.1 last sentence; and 1.2. 1st sentence	The **IAEA Safety Standards series** No NS-G-2.9	The mentioned document has been issued in the IAEA Safety Standards series, and not in Safety Series	A			
3	3.51, to add a sentence	Plant handover is the transfer of responsibilities for the plant. This should include structures, systems, and components, items of equipment, and documentation and may include personnel. **Plant handover procedure should be in compliance with national**		A			

		regulations applicable to operating organizations. Depending on the plant organization and the framework for handover, two separate types of transfers may be found: one from the construction group to the operating group directly, and the other from the construction group to the commissioning group and finally to the operating group. All of these activities should be documented					
4	3.11, to exclude	3.11 Independent oversight and control of quality of on-going works should be provided by competent organization	To exclude item 3.11. Oversight and control functions are performed by the regulatory body, according to national law of vast majority of countries			R	It says about oversight and control of quality made by third party other than regulator
5	4.43, to modify 3rd sentence	An adequate means should be available to restore **subcriticality** margin in the event of an approach to inadvertent criticality	To replace "shutdown margin" with more correct "subcriticality margin"	A			
6	5.6, 1st sentence, to add the text	To modify as follows: 5.6 The Commissioning Management System Manual (MSM) (sometimes referred to as the Commissioning Manual), **or a similar document regulating the commissioning process having a different title as per established national practice**, should form the part of the suite of commissioning documentation, set out the management organization and documentation processes	In RF documents of similar nature have titles other than "Commissioning Management System Manual"	A	… or a similar document regulating commissioning process….		

7	5.10, to modify	The Overall Plant Commissioning Programme (OPCP) **is a document giving a general presentation of the program (process) of commissioning a particular NPP or a nuclear power unit as a whole**, a description of the different commissioning stages and associated commissioning activities, and the overall plant commissioning stages schedule	To modify text as proposed. The same reason as for comment #1	A			
8	5.15, last sentence	The detailed content of the test procedures are in paragraphs….	The sentence is not completed	A			
9	Whole document	All Chapters' titles are to be in semi-bold font	For user/reader comfort.	A			This will be adjusted according to the rules for Guidelines
10	2.27, to modify	Item 2.27 shall be completed with another sub-item (d): NPP Unit under commissioning shall be isolated from areas where construction activities are in process. It will protect the Unit from events and possible violations occurred at construction areas. Contrariwise, construction areas will be protected from possible accidents at Unit under commissioning	It will establish the need to protect NPP Unit under commissioning from construction areas nearby and vice- versa.	A			
11	Title on page 31	Correct a mistake in a word "REPARATION"		A			
12	4.14, to modify	It should be mentioned that any testing shall include specific safety measures		A			
13	4.35, to modify	Heating source shall be mentioned, for example, MCP: heating of reactor coolant can be performed by heat released in the course of operation of MCP				R	This para states general information , not specific

							means of heating the coolant
14	4.39, to modify	The first sentence of this Item shall include the information that chemical neutron absorber is to be included into reactor before fuel loading. Amount of this chemical substance is to be in correspondence with technical specification requirement for subcritical state of reactor				R	This para states the purpose of fuel loading not details of the fuel loading.
15	5.15, to modify	To replace word «paragraphs» for «Annex» in the last sentence of this Item				R	Here there is a reference on a particular paragraph, not to Annex.
16	References	Three last links to IAEA Standards should be numbered and relevant changes made in the text of the document		A			
17	3.67	To substitute "**radiation** waste management" for "**radioactive** waste management"	Misprint	A			
18	4.9 and 4.19f	The term "the acceptance criteria" refers both to test purpose and objectives and to conditioned radioactive waste forms	The term "the acceptance criteria" should be mentioned in the text	A			
19	4.28 (2) and 4.28 (3) to add the text	(2) certain support systems (e.g. compressed air system, electrical system, service water system, de-mineralized water supply system, radioactive waste management system) should be commissioned prior to other systems so that they are available for the proper testing of other systems; (3) certain systems should be operational	Radioactive Waste Management System should be mentioned in the text	A			

		to ensure that other systems can be tested without jeopardizing personnel, plant or nuclear safety (e.g. Fire Protection System, Radiation Protection System, Emergency Power System, radioactive waste management system)					
20	A.11	To substitute "system for **disposal** of radioactive waste" for "system for **storage** of radioactive waste"	"System for disposal of radioactive waste" does not fit in the context of NPPs	A			

TITLE : DS446 Commissioning for Nuclear Power Plants Draft no.1

COMMENTS BY REVIEWER Reviewer: Page: 30/116 Country/Organization**:** **France** Date: 2012				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	1.3	The objective of this Safety Guide is to give recommendations based on international good practices in the commissioning of nuclear power plants, as currently followed in Member States, which will enable commissioning to proceed safely and to a high quality, with the aim of providing ~~. It will also enable~~ the necessary assurances ~~to be provided~~ that the plant has been constructed in accordance with the design intent and can be operated safely.	Clarification.	A	Accept but divide into two sentences to improve reading. Break after Member States. "This will enable commissioning to proceed safely and to a high quality, with the aim of providing the necessary assurances that the plant … "		Adopt the spirit of the proposal, but improve the length.
2.	2.3	For the achievement of future safe and reliable operation of the plant,	Clarification, to be consistent with the	A	"For the achievement of this objective and to		Clarification – check later to see if

		the commissioning process should <u>contribute</u>:	beginning of each of the following bullets.		ensure future safe and reliable operation of the plant, the commissioning process should include activities: to . . .”		wording can be enhanced.
3.	2.4	[…]verifying[…]the actual plant performances fulfill the design and safety requirements.	“Adequate margin” is not clear enough to avoid several interpretations. If we like to keep the reference to the margin measurement, it necessitate a more detailed introduction to eth notion of margin and to the corresponding safety requirements (for example: margin shall be sufficient to allow safe operation between two periodic testing/maintenance operation taking into account equipment degradation with time)	A	. . .design intent and safety requirements		Minor amendment
4.	2.4	The commissioning programme should cover all the activities to be performed on structures, systems and components to ~~bring them to an~~ <u>be confident they match the expected</u> operating mode and should cover	The commissioning program does not “bring” equipment to an operating mode. It checks, progressively, that an adequate operating mode is achieved.	A	. . components to make them operable in accordance with the design intent, and should cover . .		Accepted but to avoid the reference to operating modes.

5.	2.4	[…] should cover**, to the extent possible,** the widest range of plant conditions considered […]	Some configurations of the safety analysis report, as accident state, are unreachable during commissioning.	A			Accept as proposed
6.	2.4		As written, the commissioning programme is very wide (and especially is not limited to on-site activities - see 4.4). It might be useful to clarify that the guides focused on activities performed at the site, acknowledging that off-site activities are to be considered when defining the commissioning program and when deciding a SSC is operational.	A	Add to the scope to add paragraph 1.5a This safety guide is focused on activities performed at the site, acknowledging that off-site activities are to be considered when defining the commissioning programme and when deciding a SSC is operational.		Consistent with the manner the guide is written.
7.	2.8	The commissioning programme should be structured and appropriately justified so as to ensure that:	Adequate justification of the commissioning program should be available (and provided to the regulator on request), especially to justify its extend, considering assumptions and results in the safety analysis report.	A			
8.	2.8 bullet list	- milestones including ~~w~~those where the regulatory body authorization is required to proceed in the process of commissioning are identified~~;~~.	Typo	A			

9.	2.10 bullet list	- the points at which reviews and hold points are required to check the compliance to safety requirements and, where necessary, receive authorization for proceeding from the regulatory body;	Hold points may be established by the regulator but also by the operating organization.	A			
10.	2.16	The review should enable a judgement to be made on whether the commissioning programme should continue to the next stage, and whether the succeeding stages should be modified as a consequence of the test results or because some tests in the stage had not been undertaken or had not been satisfactorily completed.	Unsatisfactory results should warrant modification of the program to redo the test or somehow modify the test programme.	A			
11.	2.16 and 4.2	Merge 2.16 and 4.2 or reformulate/cross-reference to avoid redundancy	Redundant paragraphs	A	Amend 2.16 to include the wording of 4.2, and amend the first sentence of 4.2 to read: "sub-stages in accordance with the principles described in Stages of Commissioning (2.16) and further described in Testing Stages and Sequences (4.28)		
12.	2.17		Who performs the review (the commissioning organization, the licensee, the regulator…) ?			R	See 4.64 for details of stage review.

13.	2.19	These adjustments ~~require respect of~~ should take due consideration of safety aspects ~~conditions~~ and should result from a common agreement of commissioning and operation organizations.	Clarification	A			
14.	2.26		I might be useful to explain in a footnote the meaning of "statutory non-nuclear tests"	A	Add footnote: Statutory requirements are those prescribed by national law		
15.	§ 2.22 (pages 9 et 10)	The commissioning program should give evidence that the operating personnel is able to operate the plant in a safe way with the operating means provided to them (man-machine interfaces, control rooms, operating procedures, etc.)	Ensure the adequacy between means and requirements relative to the operating activity, in all kind of situation	A	Add another bullet to 2.8: - Evidence is obtained that the operating personnel is able to operate the plant in a safe way with the operating means provided to them (man-machine interfaces, control rooms, operating procedures, etc.) This task can be completed as part of procedure validation.		
16.	2.33 and 3.7 and 3.20 and 3.39	Merge 2.33, 3.7, 3.20 and 3.39 or reformulate/cross-reference to avoid redundancy	Redundant paragraphs	A	3.7 should remain since it is management system, but include reference to all participants. 2.33 and 3.20 will be combined (see also German comment resolution)		Rationalize these paragraphs.

					3.39 can be deleted, since it does not relate to interfaces.		
17.	3.3	Please delete “licensee”	This term is attached to English practice and “Organization responsible for commissioning” is less confusing	A			See response to German comment when it was agreed to use Operating Organization.
18.	3.4	~~For a new reactor project,~~ the management system for commissioning should be established early before the start of commissioning, <u>especially for a new reactor project</u>.	It is also true for not new design…	A	Delete “For a new reactor project”, since the statement is valid without.		Accepted
19.	3.5	The classification ~~can provide a basis for~~ <u>is an input in</u> determining commissioning requirements, methods, testing, inspections, reviews, qualification of personnel and record requirements.	Classification is not the only basis…	A	“The classification provides an input in determining commissioning requirements, . . .”		
20.	3.7 and 2.33 and 3.20 and 3.39	Merge 2.33, 3.7, 3.20 and 3.39 or reformulate/cross-reference to avoid redundancy	Redundant paragraphs See comment on 2.33	A	See comment 16 above		See comment 16 above
21.	3.8		Somehow duplicates 3.7. Might be merged…	A	Delete 3.8 but include reference to all participating parties in 3.7		Describes how to merge.
22.	3.10	Appropriate procedures should be established by the organization responsible <u>and the licensee</u> for performance and the control of	The licensee, responsible for safety and formally holding the license should be involved (see 3.18)	A	Operating organization should ensure that appropriate procedures are established for the		Minor amendment to clarify the responsibility

		commissioning activities at the site to ensure that the commissioning of the plant fulfils the ~~quality~~ provisions of commissioning programme.	Why limiting to quality ?		control of commissioning activities at the site to ensure that the commissioning of the plant fulfills the requirements of the commissioning programme.		
23.	3.11	Adequate, and where necessary Independent oversight and control of quality of on-going works should be provided ~~by competent organization~~.	Oversight and control of work is primarily to be performed by those directly involved, and it should be systematic. Independent oversight is also needed but may not be systematic. Competency is covered by adequacy.	A			Accepted
24.	3.13	There may be other representatives participating in commissioning activities, such as designers, manufacturers, and technical support organizations contracted by the licensee or those designers or manufacturers.	To clarify that it is not the TSO of the regulator.			R	TSO (Technical Support Organization) Technical support organization is a general term,
25.	3.13	The designers should also review the commissioning data, and, where necessary, be involved in the resolving of problems and defects detected during commissioning stage.	Involvement may not be necessary if the original design is implemented by correcting non conformances…	A	The designers should be involved in the review of the commissioning data, and, where necessary, in the resolving of problems and defects detected during commissioning.		Do not want to be too prescriptive.
26.	3.17/2nd bullet	- the operating group should operate systems and plant in	Clarification	A	- the operating group should operate systems		Avoid the use of expression operating

		accordance with the assumptions and intent of the commissioning programme, respecting the operating limits and conditions, and since the start of nuclear testing respecting the operating technical specifications applicable for each testing stage.~~÷~~			and plant in accordance with the assumptions and intent of the commissioning programme, respecting the relevant operating limits and conditions applicable for each testing stage.		technical specification, and to avoid differentiating the need to respect limits and conditions for non-nuclear and nuclear testing.
27.	3.20 and 2.33 and 3.7 and 3.39	Merge 2.33, 3.7, 3.20 and 3.39 or reformulate/cross-reference to avoid redundancy	Redundant paragraphs See comment on 2.33	A	See comment 16 above		See comment 16 above
28.	page 14 - § 3.21	Add bullet points: **"- to ensure that all the discrepancies are processed in line with the operating organization requirements."**	The operating organization is responsible for operations, therefore it has to make sure that the impact of any discrepancy on operation has been addressed.			R	See 4.70 where the requirement is included.
29.		"- to collect information on all equipment in order to establish a base line to be used for the monitoring of equipment performance."	Performing trend analysis and equipment performance analysis require to set up a base line.	A			Accepted but amend later to accept comment 32.
30.	page 14 - § 3.21 **1st bullet point:**	Complete the sentence: "- to ensure that the activities of the construction and commissioning are properly managed, and the issues processed in order to meet nuclear safety and plant performance requirements."	The duties of the operating organization are not to coordinate, review and control construction, but this organization is in the end responsible for nuclear safety and plant performance.	A			Accepted

31.	**page 15 - § 3.22**	Add bullet points: **"- to make decision on deviations in light of their impact on plant safety, performance and operation effectiveness."**	Consequences on operations must be thoroughly reviewed in order to capture any potential threat.	A	Don't add new bullet, but amend the 10th bullet: - To ensure that the resolution of those defects and deviations detected during the commissioning phase are resolved in the light of their impact on plant safety, performance and operational effectiveness.		The original proposal would have conflicted with the 10th bullet
32.		"- to establish a method to collect initial equipment data and to perform equipment monitoring during the life of equipment since commissioning."	Equipment performance data must be collected at the earliest stage of equipment operation. It will contribute to detect early issues that are likely to occur during the first part of equipment life, and will serve as a reference for future measurements.	A	"- to collect information on all equipment in order to establish a base line to be used for the monitoring of equipment performance during the operational life of the equipment."		Amend by combining with resolution of comment 29.
33.	page 15 – § 3.22 8th bullet point, sentence: "to consider safety aspects of commissi	Complete the sentence: "- to validate the commissioning procedures and their proposed changes in light of their compliance with operating requirements (nuclear safety, technical specifications, chemistry, etc)"	This is to reinforce the role of the operating organization in the acceptance of commissioning procedures.	A			

	oning procedures..."						
34.	3.25 bullet list	~~- the staff available;~~	Staffing should be adequate (if note, it may compromise above expectations). Staffing is not a variable	A			
35.	page 16 - § 3.25	Add bullet point : - **The importance of the tested system in regard to safety**	An appropriate attention has to be given to safety systems. This can be a reason to involve a reinforced testing team.	A	- The number, complexity and safety significance of the systems to be tested.		Amend the first bullet to include safety significance.
36.		The paragraphs under "FUNCTIONS AND RESPONSIBILITIES" could be merged with the ones under "MANAGEMENT SYSTEM"	To avoid duplication			R	The organizational aspects are part of the management system, and although the functions and responsibilities are included in a management system, in this case they require specific descriptions.
37.	3.29	3.29 should be located with 3.51 and 3.52	This would avoid repetition and enabling grouping the paragraph dealing with the same topic			R	See G44
38.	3.30	actual functional responsibilities may <u>vary</u> ~~be assigned~~ according to the national regulations and practice	Clarification	A			Accepted
39.	3.32	The responsibilities of the	Alternate wording	A	The responsibilities of		Apply to 3.31, 3.32,

		commissioning group ~~generally~~ should generally include the following:			the commissioning group should include but are not limited to the following:		3.33, but with "in relation to commissioning" for the construction group and for the operating group.
40.	page 19 - § 3.32	Add bullet point : Record all the commissioning feedback experience	All the commissioning experience must be recorded to improve the commissioning activities	A			Accept
41.	3.32 bullet list	— to ensure that ~~a procedure is~~ provisions are in place to control the calibration of test and measurement equipment;	Procedure is restrictive…	A	— to ensure that a process is in place to control the calibration of test and measurement equipment;		Provisions is too vague
42.	3.32 bullet list	— to ~~establish a procedure to~~ ensure that all participants in the commissioning process are suitably qualified and experienced;	Procedure is restrictive…	A			Accept
43.	3.32 bullet list	— to establish ~~a procedure~~ and implement provisions for controlling temporary changes to plant and equipment;	Procedure is restrictive…	A	— to establish and implement a system for controlling temporary changes to plant and equipment;		Provisions is too vague
44.	3.32 bullet list	- to maintain a record of limiting conditions in commissioning and ensure tests to be performed do not exceed these conditions;	Abiding to these limits is important	A			Accept
45.	3.32 bullet list	— to resolve any deviation detected, document resolution and producing test reports;	Documenting resolution of deviations is a key action	A	- To ensure that any deviations detected are recorded, resolved and documented		Clarification.

46.	3.32	Please move: *"to verify that the installation of structures, systems and components has been satisfactorily completed and codified for proper identification; "* to the next section dedicated to the role of construction group.	This activity is part of the Construction responsibility. It is however part of the point to be check during installation handover between erection and commissioning			R	The first clause in 3.31 covers the responsibility of the construction group and the commissioning group verify that the installation is to their requirements.
47.	3.32	Replace "to ensure the configuration management, maintaining the consistency between as-built drawings and procedures and physical configuration and the design requirements; "to "to ensure that the test procedures are consistent with the physical state of the installation and that there is no discrepancies between the plant state consider during design and the tests procedures that have been carried out. Any discrepancy shall be reported and analyzed with design teams."	Part of these requirements also involve design responsibility and erection responsibility. Commissioning cannot assume such a wide activity. Configuration management by itself might need to be addressed in several AIEA guides in a consistent way. We shall also keep in mind that some departure might come from the designers that might ask for further modification of plants/procedures/criteria… to fit design requirements or correct design deviations	A	"to ensure the configuration control maintaining the consistency between the physical state of the installation and the test procedures and design requirements. Any discrepancy shall be reported to the relevant parties."		Amended to restrict tot the responsibilities of the commissioning group.
48.	pages 17 - 18 - § 3.32 (Responsibilities of the	**Add bullet points:** "- to establish a procedure to perform, in liaison with the operating organization and, as needed, the designers and manufacturers, comprehensive	All the pieces of information that can contribute to decision making must be processed in order to make sure that all the aspects and impacts of an issue are taken			R	`The proposal is beyond the responsibilities of the commissioning group

	Commissioning group)	reviews of deviations and their management."	into account.				
49.	**pages 17 - 18 - § 3.32** (Responsibilities of the Commissioning group)	Add bullet points: "- to establish a procedure in order to compile the lessons learnt from commissioning activities, to draw conclusions and related corrective actions."	Learning organizations lead to permanent improvements based on the analysis of issues.	A			Accepted
50.	1st bullet point on page 18	Complete the sentence: "To ensure that the commissioning procedures comply ..... **and minimize the amplitude and number of transients of components**"	Keeping the transients within the design limits will preserve the lifespan of the components.			R	Not applicable to the topic of this bullet.
51.	3.33 bullet list	- to increase competency in the methods of operation of the plant;	Typo	A	To increase competence in the operation of the plant		
52.	3.33 bullet list	- to carry out operation and maintenance with competent staff using approved techniques to meet both the needs of the commissioning programme and future safe operation (i.e. implementing the manufacturer	Focus on commissioning need is not enough. Later safe operation is also to be considered, especially for maintenance of system that will be set up early at the site…			R	These responsibilities (3.33) are those related to commissioning.

		recommended maintenance schedule…) ;					
53.	page 19 - § 3.33 5th bullet point	**Complete the sentence:** to carry out operation and maintenance with competent **and duly authorized staff** using approved techniques to meet the needs of the commissioning program	Staff must be competent and its competence must be recognized through an authorization.	A			Accepted
54.	3.33 bullet list	- to establish and implement provisions ~~a procedure~~ including organizational responsibility to maintain plant design and configuration control	Procedure is restrictive…	A	To establish and implement arrangements including organizational responsibility to maintain configuration control over the commissioning phase up to the start of operating life. This includes maintaining the safety analysis report current and up to date.		Provisions is too vague. Includes resolution of comment 55
55.	3.33	Please modify : "to establish and implement a procedure including organizational responsibility to maintain plant design and configuration control over ~~the operating life of the plant~~ **the commissioning phase up to the start of operating life with the purpose of ensuring such control over the operating life.** This includes maintaining the safety analysis report current and up to date"	Commissioning and Operation are two different phases of the plant's lifecycle. So there should be two different documents for each phase.	A	See above		See above

56.	page 19 - § 3.33	**Add bullet point :** - **Record all the operating feedback experience**	All the operating experience must be recorded to improve the operating activities	A	Record all the operating experience feedback and the associated lessons learned.		Accepted with minor modification
57.	3.34 bullet list	— to provide <u>inputs for</u> a safety assessment when necessary;		A	To participate in a safety assessment when necessary		Accepted with minor modification
58.	3.34 bullet list	— to <u>help</u> design modifications in order to rectify design deficiencies and to provide complete documentation of the modification, including requalification tests;	Responsibility for safety lies with the licensee. These organizations may advise the licensee	A	To assist with design modifications in order to rectify design deficiencies and to provide complete documentation of the modification, including requalification tests;		Accepted with minor modification
59.	3.35	Many activities ~~are~~ <u>have</u> to be performed in parallel with the commissioning of the plant, such as activities relating to construction, operation and maintenance~~.~~		A	Many activities <u>are</u> performed in parallel with the commissioning of the plant, such as activities relating to construction, operation and maintenance~~.~~		Accepted with minor modification
60.	3.38	~~The~~ appropriate work control processes should be established to co-ordinate the activities of all groups involved in commissioning and to cover the major work activities, including post-work testing. ~~This~~ <u>These</u> process<u>es</u> should provide for the proper channelling of the work to the person responsible for the system and for ensuring notification and	Clarification (and consistency)	A			Accepted

		awareness in the control room of all the work activities that are in progress.					
61.	3.39	Delete 3.39	Redundant with 3.7 and 3.8	A			Accepted
62.	3.40	The lines of communication should support the commissioning schedule and should ~~comply with~~ be consistent with the agreement on the scope of activities in both organizations, in particular at the interfaces.	Alternate wording (compliance may be too strict)	A			Accepted
63.	3.41	Delete 3.41	Superfluous			R	Subject of interface and needs definition in advance
64.	3.42	The following ~~particular areas of consideration are appropriate to the~~ interfaces between construction and commissioning should in particular be considered:	Alternate wording	A			Accepted
65.	3.44	The following ~~particular areas of consideration are appropriate to the~~ interfaces between commissioning and operating activities should in particular be considered:	Alternate wording	A			Accepted
66.	3.44 bullet list	- changes in operational responsibility for safety depending on considered commission milestones and performed transfers to operation, including the nomination of responsible persons;	Legal responsibility for safety lies with the licensee.			R	Need to be clear on responsibility for safety
67.	3.44	- provision of sufficient	Training is not only during	A			Accepted

	bullet list	opportunity for the operating personnel to become ~~both~~ more trained in and familiar with operating and maintenance techniques for the plant;	commissioning.				
68.	3.44 bullet list	- procedures for radiological training, monitoring, dose recording and protection for site personnel ~~and keeping records of occupational exposures deriving from the commissioning in accordance with national regulations~~;	Training needs emphasis (see next bullet) No need to stress on dose rrecording.	A	- procedures for radiological monitoring, including personal dose recording and radiation protection ~~for site personnel and keeping records of occupational exposures deriving from the commissioning in accordance with national regulations~~;		Accepted with minor amendment
69.	3.44 bullet list	- ~~training in radiological safety and~~ authorization of commissioning personnel to work in the controlled area;	Can be combined with previous bullet (see previous comment)			R	Radiation Training is of particular importance during commissioning
70.	3.44 bullet list	~~—~~ ~~development of arrangements and instructions~~ provisions for emergency preparedness and response;	Emergency response is also to be included.	A	Development and implementation of measures for emergency preparedness and response		Accepted with minor amendment
71.	3.48	Where appropriate, hold points should be established in order to assess test results before regulatory authorization may be given to proceed ~~as required by national practice~~.	Superfluous	A			Accepted
72.	3.48 and 2.28	Merge 2.28 and 3.48 or reformulate/cross-reference to	Redundant paragraphs See comment on 2.28	A	2.28 has been rewritten (PV)		Accepted

		avoid redundancy					
73.	3.49	Before authorizing the loading of nuclear fuel ~~or~~ and before initial criticality, the regulatory body should complete as appropriate the review and assessment of such aspects as:	Clarification. Both steps are major steps.	A			Accepted
74.	3.53	Responsibility for systems **required for introduction of radioactive material milestone** should be transferred gradually to the operating group. At the later, it could occur just ~~as soon as the testing~~ before the introduction of fissile and radioactive material (pre-nuclear) tests have been performed and the results approved.	Clearer wording	A	Before the introduction of fissile and radioactive material (pre-nuclear) to commissioning, the responsibility for systems should be transferred gradually to the operating group as soon as the testing has been performed and the results approved. Before the start of nuclear testing, all the systems should be under the control of the operating group.		Accepted with additional clarification
75.	3.55 bullet list	— results of load tests, pressure tests and flushing and cleaning records~~: a master strainer logbook used for equipment testing and piping flushing;~~	Too much detailed	A			Accepted
76.	3.56	In performing the review, ~~meetings should be held and~~ plant walk downs should be carried out by representatives of the organizations involved in the handover process and, as	Meetings may not be necessary.	A			Accepted

		necessary, meetings should be held between these organizations.					
77.	3.58	**Both the operating organization and the commissioning organization** should have human resources…	Is this the entity responsible of commissioning as described in 3.3 or the license holder to operate the plant as defined in 2.31	A	Replace "A licensee" with "The operating organization" and continue the rest as in original.		Accepted
78.	3.67	The management systems should ~~include the requirements for generic management system processes in accordance~~ be consistent with GS-R-3, GS-G-3.1 and GS-G-3.5. The~~, which covers~~ following processes applicable to commissioning should be addressed in the management system.	To be consistent with 3.1. Requirements only appear in GS-R-3 (recommendations are in GS-G-3.1 and GS-G-3.5).	A	The management systems should ~~include the requirements for generic management system processes in accordance~~ be consistent with GS-R-3, GS-G-3.1 and GS-G-3.5. The~~, which covers~~ following topics applicable to commissioning should be addressed in the management system.		Accepted with change from processes to topics since not all bullet points are processes.
79.	3.68	The commissioning activity should be performed according to a well-defined management system which addresses ~~involves~~ main responsible organizations and subcontractors.	Clarification	A	Accept with a change from "addresses" to "covers"		Accepted with minor change.
80.	3.70	The provision of a consistent process for the management of non-conformances is a requirement of all ~~safety~~ management systems.~~, and~~ the process should address both non-conformances ~~applies to the~~	Clarifications	A	The provision of a consistent process for the management of non-conformances is a requirement of safety management systems..~~,~~ ~~and~~ This process should		Accepted with modifications for clarity.

		~~failure~~ of components (inability to meet their specified performance requirements) and of ~~for~~ larger systems (inability to meet their requirements from the safety analysis or other performance specifications).			apply to the failure of components to meet their specified performance requirements) and of ~~for~~ larger systems to meet their requirements from the safety analysis or other performance specifications.		
81.	3.72	In the preparation of the commissioning programme, consideration should be given to experience gained around the world and on which information is available (through industrial bodies or other means).	Restricting to industrial bodies is not warranted.	A	In the preparation of the commissioning programme, consideration should be given to experience gained around the world and all the information available in the nuclear as well as other industries.		Accepted with modificatioin
82.	3.73	From construction to commissioning and finally to operation, the plant should be adequately monitored and maintained. It should be subject to the required periodic tests and inspections in order to protect equipment, to support the testing stage and to continue to comply with the safety analysis report and operational limits and conditions.	OLC should also be mentioned as they become progressively applicable during commissioning (once fuel is on-site)	A			Accepted
83.	page 28 § 3.75 second	**Address the following concern:** "Appropriate emergency arrangement should be established from the time	Emergency arrangement should be established prior to fuel on site. Emergency			R	The details follow later – this introduction covers

	sentence	that the construction site can have a significant impact on environment (presence of dangerous substances on site, risk of fire, massive discharge of nocuous substances into environment…) These arrangement should be reinforced in line with emergency response requirements since nuclear fuel is on site and complete emergency preparedness arrangements should be in place and be tested before the commencement of fuel loading"	situations could occur in case of fire, for example. Fire can have consequences on environment due to release of substances into environment. This should lead to putting in place an emergency plan to protect people and environment.				the arrangements for the commissioning phase
84.	3.78	All the parties involved in the commissioning programme should be trained appropriately to cope with any ~~anticipated~~ emergency at the plant during commissioning.	Superfluous	A	All the parties involved in the commissioning programme should be trained appropriately to cope with ~~any~~ anticipated emergency at the plant during commissioning.		One can only train for foreseen events, anticipated emergencies.
85.	3.80	Commissioning activities including the commissioning tests should be planned and performed within the limits and conditions of the safety analysis report, of the operational limits and conditions and of the license conditions.	OLC and license conditions should also be mentioned	A	"limits and conditions derived from the safety analysis report. However, faults may occur, and for each test procedure consideration should be given to any fault responses and contingency actions required.		Accepted with some change.
86.	4.1	For implementation of commissioning activities	Consistency with the IAEA glossary.	A	For implementation of commissioning activities		Accepted with clarification.

		personnel may need to be licensed by the ~~nuclear~~ regulatory <u>body</u> ~~authority~~ according to national regulations.	Further more, personnel may need a licence from other regulators than the nuclear safety regulatory body…		some personnel may need to be formally authorized / licensed according to national regulations.		
87.	4.2	The commissioning program should be implemented in stages/sub-stages so that at the end of each stage a review of the results can be performed to support the decision whether the commissioning program ~~shall~~ <u>may</u> continue to the next stage,	Clarification	A			
88.	4.2 2.16	Merge 2.16 and 4.2 or reformulate/cross-reference to avoid redundancy	Redundant paragraphs See comment on 2.16	A	Amend 2.16 to include the wording of 4.2, and amend the first sentence of 4.2 to read: “sub-stages in accordance with the principles described in Stages of Commissioning (2.16) and further described in Testing Stages and Sequences (4.28)		Accepted as comment 11.
89.	After 4.2 (or after 4.64)	The operating organization should establish a safety committee to review the commissioning programme and the results of commissioning tests, mostly at the end of each test stage, and to provide technical advice to the operating organization.	Add a section on the need to establish and independent committee to review test results before a phase change, as recommended in IAEA safety requirement NS-R-5 (§8.7 and 9.15)			R	The detail may be determined by national practice.

		This safety committee should have among their membership the necessary breadth of knowledge and experience to provide appropriate advice. This membership should, to the extent necessary, be independent of the operations management raising the safety matter.					
90.	4.4	In such cases specific justification should be provided showing the validity of the performed tests to the current installed conditions of the SSC, conditions used to preserve the SSC since shipped to the site, and related functional and physical interfaces.	Transport and storage conditions should also be considered.			R	Covered by the validity at the current installed conditions.
91.	4.7	Preparatory process for testing should clearly identify the test purpose and test objectives from the commissioning test program, with particular focus on the safety objectives. The safety objectives should be clearly put in evidence ~~in order to facilitate the regulatory review. The safety objectives should~~ and be linked with safety criteria and characteristics mentioned in (preliminary) safety analysis report.	The recommendation is true but the primarily focus is not the regulator. It should be for the licensee benefit first…	A			Accepted
92.	4.9		This "their acceptability or the evidence of potential non-conformity" is unclear.	A	The acceptance criteria should be clearly defined in the testing procedure		Remove the vague / unclear statement about potential non-

			It should be clarified. The “acceptability” is well covered by the last sentence of 4.9		taking into account potential measurement uncertainties. The technical basis of the acceptance criteria should be consistent with the safety objectives and requirements, and the design.		conformance.
93.	4.11	This definition and justification should take~~ing~~ into account the limitation	Typo	A			Editorial
94.	4.12	A list of the acceptance criteria that are to be verified should be available at the end of each commissioning stage or sub-stage, notably the acceptance criteria linked to safety ~~concerns~~.	Clarification Superfluous	A	A list of the acceptance criteria that are to be verified should be available at the end of each commissioning stage or sub-stage, notably the acceptance criteria linked to safety ~~concerns~~ requirements.		Slight modification to replace concerns with requirements.
95.	4.18	The test procedures should state any necessary deviations/changes from the normal plant operating configurations and the associated compensatory measures (if any). Examples of such deviations/changes may be temporary interlock bypasses, temporary additional interlocks, temporary system bypasses, valve configurations and instrument settings. The test procedures	Relevant compensatory measures should be identified and implemented.	A			Accepted

		should also include all necessary checks that are needed to ensure that these deviations and their associated compensatory measures are ~~made~~ implemented correctly.					
96.	4.19 b	b. *Test objectives and methods*- The detailed objectives of the test and the methods by which they are to be achieved should be stated.	To be consistent with a. but avoiding duplication.	A			Accepted
97.	4.19 f	f. *Acceptance criteria*- The acceptance criteria, especially safety criteria, should be stated and this statement should wherever possible be quantitative as well as qualitative (for fuel loading, for example). Origin of the criteria should be mentioned.	To emphasis on safety criteria.	A	f. *Acceptance criteria*- The acceptance criteria, especially safety *related* criteria, should be stated and this statement should wherever possible be quantitative as well as qualitative (for fuel loading, for example). Origin of the criteria should be mentioned.		Safety related criteria makes better sense.
98.	4.19 j	j. *Completion of test*- Provision should be made for a statement by the individuals responsible to indicate that the test has been ~~satisfactorily~~ completed (whether results are satisfactory or not) and that the systems have been returned to normal conditions. The removal of temporary changes or of any abnormal line-up should be individually	Clarification to avoid confusion between satisfactory results and satisfactory completion.	A	j. *Completion of test*- Provision should be made for a statement by the individuals responsible to indicate that the test has been ~~satisfactorily~~ completed (*irrespective of* whether results are satisfactory or not) and that the systems have been returned to		Add clarification – irrespective of whether results are satisfactory or not.

		specified; for example, as steps in the test procedure.			normal conditions. The removal of temporary changes or of any abnormal line-up should be individually specified; for example, as steps in the test procedure.		
99.	4.19 and 5.15	4.19 and 5.15 may be combined to avoid repetition	Repetition	A			Amended originally in response to German comments
100.	4.20	Techniques and methods of data analysis including the analysis of measurement results should be presented in the Test procedure. Measurement uncertainties should be taken into account when defining acceptance criteria. The quality of the measurement instruments and the software for data analysis should be verified before beginning of the test.	Uncertainties in measurement should be taken into account when defining the appropriate acceptance criteria, considering the safety criteria and expected instrument class.	A	Techniques and methods of data analysis including the analysis of measurement results should be presented in the Test procedure. Measurement uncertainties should be taken into account *when comparing the results with the* acceptance criteria. The quality of the measurement instruments and the software for data analysis should be verified before beginning of the test.		Ensure that the uncertainties are considered when comparing the results.
101.	4.21	In order to comply with the ~~requirements prescribed in~~ testing procedures,	Superfluous	A			Accept
102.	4.22	Delete 4.22	Too much detailed. See also next comment on 4.23			R	Important topic needs the detail
103.	4.23	The management system should	To cover the idea described	A	The management system		Simplification

		provide guidance to the commissioning personnel, regarding the maintenance and calibration of measuring and test equipment as well as documents to be maintained on such subjects.	in 4.23 but without too much details		should *include details* regarding the maintenance and calibration of measuring and test equipment.		
104.	4.25 bullet list	• written authorization, ~~as~~ if required, ~~should be~~ has been issued prior to the commencement of the performance of the test or commissioning stage;	Clarification	A			Accept
105.	4.25 bullet list	• compliance with regulatory authorization corresponding to what was envisaged in the commissioning program, to the hold points established by the regulatory body and also to specific conditions ~~and request~~ issued by the regulator in accordance with national practices;	Superfluous	A			Accept
106.	page 34 - § 4.25	Add bullet points: "- All necessary conditions to ensure proper chemical state of a circuit have been previously determined and implemented."	The testing prerequisites do not include proper chemistry management in order to preserve the lifespan of the circuits.	A	All special conditions, including chemical conditions, for the plant . . .		Include chemical state within fourth bullet.
107.	**page 34 - § 4.25**	"- The conditions to ensure the conservation of equipment after its testing have been determined and implemented."	Conservation of circuits after testing is not addressed neither.	A			Accept
108.	4.27	Administrative controls should be established to ensure that	Alternate wording			R	Original is acceptable

		activities are started or performed as required on the basis of the programs, pre-defined sequence and according to requests or constraints imposed by involved parties (commissioning organization, operating organization, regulatory authority… ~~and other parties as envisaged~~).					
109.	4.34	Delete 4.34	Too much detailed and self evident. Regulatory tests have to be performed….			R	Included in original version.
110.	438	Delete 4.38	True, but not specific to these tests. Redundant with 2.3, 2.11, 2.12, 3.32, 4.16…			R	Include because this is the first time operation of integrated systems occurs.
111.	4.45	Initial fuel loading should be supervised by duly authorized personnel and any ~~changes occurring in the reactor~~ safety concern should be reported immediately to the control room personnel.	Broader expectation on what is to be reported to control room.	A	Initial fuel loading should be supervised by duly authorized personnel. Any unexpected occurrences should be reported immediately to the control room personnel.		Clarification.
112.	4.51	Before the approach to criticality is started, operability of the automatic reactivity shutdown devices should be confirmed ~~is required to be ensured~~ and appropriate start up monitoring instrumentation to be available to	Clarification	A	Before the approach to criticality is started, the start-up monitoring instrumentation and associated automatic shutdown system should be confirmed available		Clarification

		initiate shutdown devices when necessary.			and operable.		
113.	4.55	In order to permit power testing, assurance should first be obtained on the basis of the information gained from these tests that there is no ~~serious~~ significant discrepancy between measured values of reactor physics parameters and other parameters and values used in the safety analysis report.	Clarification	A			Accepted
114.	4.64	At the end of a stage, the results of all the tests in that stage and the general condition of the plant should be reviewed	Clarification	A			Accepted
115.	After 4.64 or 4.67	The operating organization should establish a safety committee to review the commissioning programme and the results of commissioning tests, mostly at the end of each test stage, and to provide technical advice to the operating organization. This safety committee should have among their membership the necessary breadth of knowledge and experience to provide appropriate advice. This membership should, to the extent necessary, be independent of the operations management raising the safety matter.	Add a section on the need to establish and independent committee to review test results before a phase change, as recommended in IAEA safety requirement NS-R-5 (§8.7 and 9.15)			R	Organization matters of the commissioning process are beyond the scope of this safety guide. See also comment 89. NS-R-5 does not apply to power reactors (§1.1)

116.	4.66	To ensure that the commissioning programme proceeds in an orderly manner, suitable preparations should be made so that the stage completion and approval documents can be produced both expeditiously and with high quality.	Document quality should be ensured, not only fast writing and approval.	A	To ensure that the commissioning programme proceeds in an orderly manner, suitable preparations should be made so that the stage completion and approval documents can be produced in accordance with the schedule.		Clarification, but quality requirements for documentation are not specific to this stage but apply at all times.
117.	4.69	Although it may be ~~expedient~~ convenient to prepare summary reports for a quick assessment of the test results, a formal comprehensive report should nevertheless be established containing all the required information, including a collation and final evaluation of the test results.	Expedient is not the most appropriate word. Quality is also expected.	A			Accept
118.	4.70	During commissioning, changes to plant design, programmes or tests may be necessary, unexpected results may be obtained and incidents may occur. The operating organization should establish procedures for dealing with these situations within the frame of its management system, with due account of national regulations.	National regulations have to be abided. The management system is to be consistent with them…			R	All aspects of management system will have to conform to national regulations.
119.	4.78	− A review should be carried out	Corrective and preventive	A	− A review should be		Simplification

		to understand the cause(s) of event and to decide on the corrective actions, as well as other actions, to be taken.	actions		carried out to understand the cause(s) of event and to decide on the corrective & preventive actions to be taken.		
120.	5.4	Methods for the preparation, safe keeping, retrieval and review of documents are specified in the management system.	Makes link to the management system	A	A document control procedure should include methods for the preparation, safe keeping, retrieval and review of documents. The procedure should include controls to ensure that those persons participating in a commissioning activity are provided with the *updated* approved procedures.		Accepted with modification
121.	5.4	Create a separate paragraph for the second sentence of 5.4 "5.# Document control procedures should be in place to ensure that those persons participating in a commissioning activity are provided with approved procedures "	Separate idea.			R	Keep together but refer to proposed amendment above.
122.	5.10 5.11 5.12	Merge 5.10, 5.11 and 5.11 in a single paragraph, starting it with saying it is a commonly used practice: "5.10 To document the commissioning program and its	Alternate documents may be established			R	Topics are sufficiently different to describe in separate paragraphs.

		schedules, the following documents are usually established: ~~5.10~~ - The Overall Plant Commissioning Programme (OPCP) gives a general presentation of the Commissioning Program for the whole plant, a description of the different commissioning stages and associated commissioning activities, and the overall plant commissioning stages schedule. ~~5.11~~ - System Commissioning programmes (SCP) are related to a System (or group of Systems or particular commissioning scope). Each SCP gives a brief description of the objectives, principles, test conditions and acceptance criteria for all the tests to be performed within the test stages for the concerned system (s), including the reference to documents to be used for test performance (test guidelines, test procedures), the stages during which they are performed and their logical sequence. ~~5.12~~ - Stage Commissioning Programs (StgCP) are related to a Commissioning Stage (or sub-stage). The StgCP defines the prior conditions to start the stage as well as waivers with respect to the Technical Specifications after fuel					

		loading, gives the chronology of all the tests and activities to be carried out during the related stage and includes the list of Test Procedures to be performed during the stage and the list of operating procedures and periodic testing procedures to be applied / validated during the phase.					
123.	5.10, 5.11 and 5.12		A link with the commissioning program (2.4 to 2.16) would be useful	A	Amended paragraphs result from the German comments		See proposed amendment in response to comments from Germany
124.	5.13	Procedures should be established by the ~~responsible~~ organization responsible for the control of commissioning activities at the site, in cooperation with the licensee, to ensure that commissioning of the plant fulfils the provisions of the commissioning programme.	Clarification	A	Procedures should be established by the ~~responsible~~ organization responsible for the control of commissioning activities at the site to ensure that commissioning of the plant fulfils the provisions of the commissioning programme.		Accepted for clarification
125.	5.14	[…] in accordance with ~~authorized~~ approved written procedures.	Generally, the only SCPs are submitted to the regulatory because of the quantity of test procedures.	A			Accepted
126.	5.15	In addition to the detailed step-by-step ~~procedure~~ proceeding they should contain specific	Alternate wording	A	In addition to the detailed step-by-step ~~procedure~~ instructions they should		Accept but with change from proceeding to

		information about safety requirements, emergency procedures, programmes and test data collection.			contain specific information about safety requirements, emergency procedures, programmes and test data collection.		instruction.
127.	5.16	The format of a report may vary but ~~normally it should~~ usually includes:	Offers flexibility	A			Accept
128.	5.16 bullet list	— evaluation of results, including statements that the acceptance criteria have been (or not) met;	Do not presume of test results	A			Accept
129.	5.17	A summary report shall be drawn up on each stage (sub-stage) of the testing. Besides essential results of the test stage concerned, the report shall contain a summary of the observations made during the testing as well as an assessment of the appropriateness of the testing performed (and associated results) in the stage concerned and of any necessary changes to the testing programme or the plant use.	Clarification	A			Accept
130.	Appendix	Transform appendix into annex		A			Accept
131.	Annex		Consider changing it to a safety report with additional information			R	Needs to stay until a TecDoc or similar can be written.
132.	page 50 - § A.2	**Add bullet point :** - **Verification, before fuel loading, that all security conditions are met to avoid**		A			Accept

		from intentionally carrying out unauthorized actions that could jeopardize safety at the installation, and to prevent sabotage.					
133.	page 51 - § A.3	**Add bullet point :** Identification of the maximal personnel dose rate admitted	Loading must be also considered on radiological point of view.	A	- Establishment of radiation control and protection measures		Refers to Appendix A3
134.	page 59- A.15	**Address the following concern:** Appropriate provisions linked to digital control systems commissioning should be taken into account.	The text does not address such precautions.			R	Control and instrumentation may be analogue or digital
135.	Additional comment	Independent safety organisation should implant Checking program, audit program during commissioning phase.	Independent safety organisation is a EDF good practice to implement from commissioning			R	More information required before this can be recommended in a safety guide.
136.	Additional comment	The guideline does not take into account the preparation and the validation of operating and safety documents as GOR, PT, System procedures,… during commissioning phase.				R	Sufficient references to validation of operating procedures without being specific about which ones individual utilities use.

Draft Safety Guide DS446 "Commissioning for Nuclear Power Plants"
Status: For MS consultations Deadline 29 February 2012, Draft No.1, 2011-Nov

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
2	1			**General Comment:** Most of the following comments are to increase the clarity. The substructure of the chapters can be improved, by following principles: - The text should firstly address the general issues and then the particular. - If responsibilities and roles are defined, this should be done as complete as possible, so that the reader finds all the information regarding one role or process closely together.		Conduct a general review after incorporation of all comments.		
2	2	2.4 - 2.27	General Comment to 2.4-2.27	Before the chapter COMMISSIONING PROGRAMME is addressed, the REGULATORY BODY ROLE (2.28 - 2.30), the OPERATING ORGANIZATION ROLE (2.31 - 2.33) and the MANAGEMENT SYSTEM FOR COMMISSIONING (3.1 - 3.11) should be defined.			R	The content of the commissioning programme must be established before the responsibilities

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				This should be done, before details on the COMMISSIONING PROGRAMME are given in order to allow the reader to understand from the start which task is done by whom and how responsibilities are distributed among regulatory body and operating organization.				can be allocated.
2	3	3.1-3.11	General Comment to 3.1-3.11	3.67 gives a very good overview of the MANAGEMENT SYSTEM which should be given together with these first clauses who address the management system (3.3) in order to allow the reader instantly to have this overview on the tasks carried out by applying the management system.	A	Move para 3.67 to follow 3.3, and remove the subtitle PROCESS IMPLEMENTATION which currently precedes 3.67		Establishes early in the description what is included in the management system.
2	4	3.13 and 3.17	General Comment to 3.13 and 3.17	3.17 defines commissioning and operating group. This should be done close to 3.13 (before 3.14) where these groups are firstly mentioned.			R	3.17 is not the definition of the group, but describes the main functions
2	5	3.14	General Comment to 3.14	The responsibility of the operating organization is already made clear in its separate chapter at 2.13-2.33. This clause is a repetition and does not supply new information – 3.14 should be left out.			R	Role of operating organization in 2.31-2.33 is not the same as the discussion on

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
								possible arrangements in 3.14
2	6	3.15	General Comment to 3.15	This clause is already covered by 3.21 and 3.22 so 3.15 should be left out.			R	The two paragraphs are complementary, not duplicating.
2	7	3.18 – 3.22	General Comment to 3.18 – 3.22	Clause 3.18 till 3.22 are addressing issues of the operating organization. These aspects are treated under the chapter OPERATING ORGANIZATION ROLE on page 10 – the clauses 3.18-3.22 should be included there for readability.	A*	Para's 3.18- 3.20 can be moved to 2.31, with some amendment to avoid duplication. The section on Operating Organisation needs a new introductory paragraph as from NS-G-2.4		Avoid duplication, and keep 3.21 and 3.22 in the section on Operating Organization, with new introduction.
	7 – 13				A	Following revision of the structure of these paragraphs the comments will be reviewed again to ensure that the individual comments are resolved.		

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
2	8	3.22	General Comment to 3.22	This clause is very similar to 3.21. It should therefore be integrated in 3.21 especially those bullets in 3.21 which declare responsibilities of the operating organization			R	3.22 is complementary to 3.21
2	9	3.23 – 3.27 and 3.32	General Comment to 3.23 – 3.27 and 3.32	Since the chapter deals with the MANAGEMENT, all the clauses should are already linked to the responsibilities. It is not convenient to separate the Organization of the Commissioning Group (clauses 3.23 – 3.27) from its responsibilities 3.32. These are text parts on the same subject and should be put together.	A	Ensure that the subheadings of the chapter are given the same weight as in the table of contents. Review the separation of topics		
2	10	3.44	General Comment to 3.44	Clause 3.44 is repeating aspects that are given in 3.40, 3.42, 3.45 and 3.47. These should be preferably treated together in 3.44 by including all the necessary details in the bullets and thus giving an overview and increasing the readability.	A			Consider comments 11-13 after the other amendments have been applied.
2	11	3.46	General Comment to 3.46	This clause is better fitting to the chapter COMMISSIONING TESTS since it is treating the method of testing and should be placed in the chapter COMMISSIONING TESTS.	A			Consider comments 11-13 after the other amendments have been applied.
2	12	3.48, 3.49 and	General Comment to 3.48, 3.49 and 3.50	These are responsibilities of the regulatory body and should thus be	A			Consider comments 11-13

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		3.50		given in the chapter REGULATORY BODY ROLE.				after the other amendments have been applied.
2	13	3.67 – 3.70	General Comment to 3.67 – 3.70	These clauses address the management system and should thus be grouped to the chapter MANAGEMENT SYSTEM FOR COMMISSIONING omitting repetitions and making the text more readable.	A			See above
2	14	4.4 and 4.8	General Comment to 4.4 and 4.8	Clause 4.4 is addressing testing issues very similar to 4.8. It should be put together with 4.8 in order to be in the right chapter (COMMISSIONING TESTS) and to avoid repetition.			R	Para 4.4 refers to use of the test, and 4.8 refers to use of the results of previous testing.
2	15	4.20	General Comment to 4.20	The second phrase is part of the next subchapter and should be included in 4.21 and 4.24 instead of in 4.20	A	Just add “and verified before beginning of test” to the end of 4.24		
1	16	5.6 -5.8	General Comment to 5.6 -5.8	The tasks of the commissioning management system manual (CMSM) seem to be already addressed by the management system. It should be made clear why and for exactly what task the CMSM is required and how it interacts with the management system. In order to assure, that the CMSM	A	Change description to Commissioning Manual with a reference included to Section 3 for the content of MSM.		Clarification of what the content of the Commissioning Manual is, and use the commonly used

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
				does not interfere with the management system.				title.
2	17	5.9	General Comment to 5.9	The baseline documentation seems to overlap with the test procedures already mentioned in detail at clause 4.19. It should be assured, that the baseline documentation does not interfere with the issues already described in the chapter PREPARATION FOR TESTING.	A	Refer to the detail in Ch 5 in the introductory para to test procedures – 4.13, and Georges will rewrite. Move para 4.19 to section 5.15. 5.9 to be amended		This will keep the detail together in the documentation section
2	18	5.11	General Comment to 5.11	The system commissioning programmes seems to overlap with the test procedures already mentioned in detail at clause 4.19 in the chapter PREPARATION FOR TESTING.	A	As above		As above
2	19	5.14 and 5.15	General Comment to 5.14 and 5.15	The requirements on the testing should be given in the chapter PREPARATION FOR TESTING. Preferably in the clause 4.19 which is addressing test procedures. This way the subchapter Testing procedures (5.14 and 5.15) can be omitted.	A			As above
2	20	1.1	2nd and 3rd sentence: "It supplements and ~~elaborates on~~ provides recommendations on meeting the requirements established in Section 6 "Plant	Clarification.	A			Clarification

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			commissioning" of the IAEA Specific Safety Requirements "Safety of Nuclear Power Plants: Commissioning and Operation" [1] ~~on specific safety requirements for the commissioning programme of a nuclear power plants~~. ~~This~~ The present Safety Guide ~~is a revision of~~ supersedes and replaces the IAEA Safety Guide on Commissioning for Nuclear Power Plants which was issued in 2003 as Safety Series No. NS-G-2.9~~;~~."					
3	21	1.10	2nd sentence: "The Annex~~e~~ lists examples of typical commissioning tests."	Editorial.	A			Spelling correction
1	22	2.28-2.30	The regulatory body should specify the safety standards to be used for commissioning.	A new clause should be implemented since the approval mentioned in 2.28 is done in respect to safety which have to be defined firstly in order to carry out approvals and assessments.			R	This guide should not determine what the regulatory body should specify.
1	23	2.28-2.30	The regulatory body should especially assess the management system established by the operating organization to observe that responsibilities are clearly managed and the documentation	A new clause should be implemented to assure that the regulatory body is considered already during the development of the management system.			R	Is included in DS 416-Licensing Process for Nuclear

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			and exchange of information are well organized.					Installations. The regulatory assessment of management systems is not specific to Commissioning.
2	24	2.30	"There are several steps in the commissioning process for which the regulatory body may require the licensee to obtain prior approval and at which regulatory decisions may be made. ~~The regulatory body d~~During the implementation of the commissioning program, the regulatory body should consider introducing such ~~at~~ predefined hold points or milestones, based on the evaluation of test results, appropriate reports prepared by the licensee and onsite inspection activity~~,~~. After achieving these hold points, the regulatory body should decide whether the licensee may proceed to subsequent stage/sub stage of the commissioning program."	To clarify the role of the regulatory body in the commissioning process. The 1st sentence ist taken from the IAEA Specific Safety Guide SSG-12 "Licensing Process for Nuclear Installations" (2010), para 3.45. SSG-12 should be properly cited in the subsection "REGULATORY BODY ROLE" (paras 2.28–2.30 of the draft) and added to the list of references.	A	Change title to INTERFACE WITH REGULATORY AUTHORITY, and reference out to specific safety guide SSG-12 for the details of the licensing process during commissioning. Reword 2.30 to clarify the intent and change "decide" to approve or authorize. Refer to		Agree that the current section title implies that this should include more on the role of the regulator, which is not appropriate in this document.
3	25	2.33	"… to ensure the involvement in	Editorial.	A			Grammatical

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			the commissioning activity of the operating personnel as early~~ier~~ as possible."					
2	26	3.3	The operating organization as the responsible (license holder) for commissioning ~~Organization responsible for commissioning (Licensee)~~ should develop and implement a management system...	In 2.31 the operating organization is defined as the license holder and overall responsible. This terminus should be used for clearness in the following text.	A	Amend text to be consistent with 2.31 and for the Operating Organization as license holder to ensure that the management system that describes the overall arrangements for the management, performance and assessment of the NPP during commissioning is developed and implemented.		See other similar comments about consistency of referring to organizations.
2	27	3.9	1st sentence: "The operating organization ~~licensee~~ should establish and implement..."	In 2.31 the operating organization is defined as the license holder and overall responsible. This terminus should be used for clearness in the following text.	A			Editorial

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3	28	3.9	2nd sentence: "… the quality requirements for commissioning are met by all participating organizations in the commissioning activity including subcontractors."	Editorial.	A			Editorial
2	29	3.16	The management system has to ensure that the responsibilities remain clear at all times even if construction, commissioning and operating activities overlap in respect of utilization of personnel.	This clause is addressing the management system – this should be made clear from its beginning on. The entire clause 3.16 should be replaced by the proposed new text.	A			Better grammar than original.
2	30	3.21	4th bullet point: "… the views and experience of members of the construction, commissioning and operating groups as well as other participants such as designers, manufacturers and technical support organizations;"	Completion. With regard to other participants involved in the commissioning activities, see also paras 3.13 and 3.34.	A	Add the examples of other participants in brackets.		
1	31	3.21	The following bullet should be added to 3.21: - to communicate with and to supply the documentation as demanded by the regulatory body.	It should be made explicitly clear that the communication and documentation to fulfil the demand of the regulatory body is within the responsibility of the operating organization.	A	Incorporate in third bullet by adding "to communicate with and to arrange for the required submissions to the . . ."		The main requirement is already included, and this clarifies it.
1	32	3.21	The following bullet should be added to 3.21: - to ensure that the	3.54 describes the transfer of documentation as a key feature in the	A	Amend the new		Clarification

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			overall documentation of the plant is kept up to date during the commissioning process and granting access to the regulatory body and the groups which are involved in the commissioning process as needed for their safe and efficient proceeding.	handover process. However the overall documentation should be linked to the overall responsibility of the operating organization and included in the bullets of 3.21.		bullet and include in 3.21: "to ensure that the documentation of the plant should be kept up to date during the commissioning process (configuration control) and that all parties involved in the commissioning process have access to the current information."		
2	33	3.21	The following bullet should be added to 3.21: - to ensure adequate interfaces between different categories and groups of commissioning in order to ensure the protection and safety of the plant and personnel and to allow for adequate commissioning programme as given in greater detail in the chapter INTERFACES.	3.36 demands INTERFACES to be adequately managed to ensure the protection and safety.... This responsibility should be added in form of another bullet to 3.21			R	First bullet covers the interfaces adequately for this section. Further detail is provided in 3.36
2	34	3.22	2nd bullet point:	Completion.	A			Consistency

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			"to ensure that adequate provisions are taken enabling the availability of necessary resources (includes personnel, information and knowledge, working environment, infrastructure, finances and materials) for commissioning;"	Compare with the definition of the term 'resources' in the IAEA Safety Requirements GS-R-3 "The Management System for Facilities and Activities", footnote to para 4.1: 'Resources' includes individuals, infrastructure, the working environment, information and knowledge, and suppliers, as well as material and financial resources.				with GS-R-3
3	35	3.31	4th bullet point: "to ensure that configuration control is maintained and that the effected systems design basis documentation, including the final safety analysis report (FSAR), as required, has been updated to reflect any design changes and/or concessions;"	The abbreviation FSAR should be specified here because it is not introduced elsewhere in the draft text.	A			Editorial
2	36	3.32	"The responsibilities of the commissioning group generally should include the following: – … – to ensure that plant performance is in accordance with the design intent, including all aspects of radiological and environmental protection, nuclear and	Clarification and completion.	A			Editorial

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			industrial safety ~~and environment~~; – …"					
3	37	3.33	1st bullet point: "to participate as early~~ier~~ as possible in the commissioning activities;" 4th bullet point: "to increase competency~~t~~ in the methods of operation of the plant;"	Editorial.	A			Editorial
2	38	3.33	new bullet: - to establish and implement appropriate emergency arrangements as given in greater detail in the chapter EMERGENCY ARRANGEMENTS	In 3.75 emergency procedures are also mentioned to be within the responsibility of the operating group this should be also included in the overview of 3.33	A	To establish and implement appropriate emergency arrangements as given in greater detail in the section EMERGENCY ARRANGEMENTS		
1	39	3.34	The first bullet should be changed: … to cooperate with the operating organization and the groups that are established in order to perform the commissioning activities ~~commissioning group by means of active participation when required~~;	All other participants should cooperate not only with the commissioning group, but with all groups and especially with the operating organization that is the overall responsible.	A	To co-operate with relevant parties engaged in commissioning activities as appropriate.		

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3	40	3.46	1st sentence: "… with success criteria more numerous or more challenging ~~that~~ <u>than</u> the ones to be used during operation."	Editorial.	A			
2	41	3.49	1st bullet point: "<u>the</u> ~~preliminary~~ <u>draft of the</u> final safety analysis report;"	Clarification. The term 'preliminary final safety analysis report' could possibly cause confusion. The IAEA Safety Guide GS-G-1.4 "Format and Content of the Safety Analysis Report for Nuclear Power Plants" (2004) distinguishes in para 2.2 between • the preliminary (initial) SAR or pre-construction SAR that supports the application for authorization for siting and/or construction of the NPP; • the intermediate (updated) SAR or pre-operation SAR that demonstrates the readiness of the operating organization to start trial testing operations of the NPP before starting commercial operation; • the final SAR that incorporates the revisions to the intermediate SAR prior to first routine operation of the NPP. With respect to the licensing process, the IAEA Specific Safety Guide SSG-	A	updated (intermediate) SAR		Taken from Safety Guide SS-G-4.1

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) with comments of GRS, VdTÜV, AREVA** Pages: 22 Country/Organization: **Germany** Date: Feb, 23 2012				RESOLUTION			
Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
				12 deals with PSAR and FSAR.				
2	42	3.49	last bullet point: "the fulfilment of the applicable requirements in respect of safeguards and accounting for ~~fissile~~ nuclear and radioactive materials;"	Consistency with the terminology used in para 3.67. Regarding the difference between the terms 'nuclear material' and 'fissile material', see definitions in the IAEA Safety Glossary (2007 Edition) and in the IAEA Safeguards Glossary (2001 Edition). The IAEA safeguards agreements require nuclear material accounting activities.	A			Consistency
1	43	3.49	add new bullet point: "Before authorizing the loading of nuclear fuel or initial criticality, the regulatory body should complete as appropriate the review and assessment of such aspects as: – … – the status of storage facilities for nuclear material; – …"	Consistency with the list provided in the IAEA Specific Safety Guide SSG-12 "Licensing Process for Nuclear Installations" (2010), para 3.47. SSG-12 should be appropriately cited in the subsection "Interface with the regulatory body" (paras 3.48–3.50 of the draft) and added to the list of references.	A	Need to place a separate paragraph before 3.49 to identify the conditions to be met before authorization of fuel receipt to site.		The status of fuel storage facilities should be included but it is required at a separate milestone from fuel load or criticality.
2	44	3.51 and 3.29	3.29: A gradual handover of system and components of the plant ~~from construction group to operation group~~ between the groups involved in the overall commissioning process should be set-up with clear definition of the associated transfer of	3.51 states that the plant handover can be done from construction group to commissioning group and finally to the operating group. This route of the handover process should also be included in 3.29. Since the subject is addressed twice it should be given a reference to the	A	With amendment of Chapter to Section SYSTEM TRANSFER & PLANT HANDOVER		Includes other groups.

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) with comments of GRS, VdTÜV, AREVA** Pages: 22 Country/Organization: **Germany** Date: Feb, 23 2012				RESOLUTION			
Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			responsibilities <u>as described in greater detail in the chapter SYSTEMS TRANSFER & PLANT HANDOVER.</u>	reader where to find the greater detail to it.				
2	45	3.57	1st sentence: "Ref. ~~[1]~~ [GS-R-3] states in para<u>s</u> 4.1 and 4.2 that: … The information and knowledge of the organization ~~should~~ <u>shall</u> be managed as a resource."	Wrong reference cited. The statements are taken from the IAEA Safety Requirements GS-R-3 "The Management System for Facilities and Activities".	A	The operating organization should ensure that the resources that are essential to the implementation of the commissioning programme and associated activities are identified and made available.		From GS-G-3.1
3	46	3.58	2nd sentence: "This includes the planning of the organization and raising the competency of the staff during ~~the~~ commissioning."	Wording.	A			Editorial
2	47	3.62	last bullet point: "environmental protection and ~~waste~~ management <u>of spent fuel and radioactive waste</u>;"	Clarification and completion.			R	Keep broader consideration of waste management.
3	48	3.67	"The management systems should include the requirements for generic management system	Wording.	A			Editorial

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) with comments of GRS, VdTÜV, AREVA** Pages: 22 Country/Organization: **Germany** Date: Feb, 23 2012				RESOLUTION			
Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			processes in accordance with GS-R-3, GS-G-3.1 and GS-G-3.5, which covers the following processes applicable to commissioning~~.~~: – … – ~~Radiation~~ Radioactive waste management – Protection ~~against~~ of environment – …"					
1	49	3.69	As replacement for clause 3.69 it should be put: The management system should be developed in the form of a continuous improvement process and should therefore be monitoring its own effectiveness and indicating and making use of potential improvements during the course of its lifetime.	This clause seems to state, that the management system should monitor and measure its own effectiveness. This looks like the demand of a continuous improvement process of the management system. This would be useful and should therefore be explicitly stated.	A	The management system should be developed and implemented to monitor and measure the effectiveness of the management system to ensure that it is continuously improved.		Clarify requirement.
3	50	3.70	2nd sentence: "A robust system for … corrective and ~~preventative~~ preventive actions should be in place."	Editorial.	A			Editorial
2	51	3.75 and	The following bullet should be	3.75 states that the operating	A	: - to manage		Remove the

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) with comments of GRS, VdTÜV, AREVA** Pages: 22 Country/Organization: **Germany** Date: Feb, 23 2012				RESOLUTION			
Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		3.21	added to 3.21: <u>- to manage emergencies in the commissioning phase and implementing appropriate emergency arrangements as given in greater detail in the chapter EMERGENCY ARRANGEMENTS.</u>	organization should be responsible for managing emergencies in the commissioning phase. Since the responsibilities of the operating organization are already given in 3.21 this needs to be added to 3.21.		<u>emergencies in the commissioning phase implementing appropriate emergency arrangements as given in greater detail in the chapter EMERGENCY ARRANGEMENTS</u>		"and"
1	52	4.9	... The technical basis of the acceptance criteria should be consistent with the safety objectives and requirements <u>and include the latest knowledge and experience gained before the end of the commissioning tests.</u>	The acceptance criteria should be clearly defined in the preparatory activity but they also need to take into account information that is gathered by experience during the test.	A	The technical basis of the acceptance criteria should be consistent with the safety objectives and requirements, the design intent and the results of previous testing.		Clarification
3	53	4.10	2nd and 3rd sentence: "Acceptance criteria should be ~~organized~~ <u>grouped</u> into <u>several categories</u> ~~families~~ regarding their importance to safety. At least two <u>categories</u> ~~families~~ should be defined: …"	Wording.	A			Improved terminology
1	54	4.11	"… In cases, where safety requirements are verified by calculation, the computer code or	Insert explanation in order to establish and implement a good practice when using calculation techniques.			R	Rejected as too detailed descriptions of

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) with comments of GRS, VdTÜV, AREVA** Pages: 22 Country/Organization: **Germany** Date: Feb, 23 2012				RESOLUTION			
Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			simulation tools should be validated to ensure the quality of their predicted values and to establish their limits of applicability, bias and level of uncertainty, in accordance with international standards. Verification relates to the process of determining that the controlling physical equations within the computer code or simulation tool have been correctly incorporated. Validation relates to the process of determining whether the overall computational model is an adequate representation of the real system being modelled and to quantify any calculation bias and uncertainty.”					verification and validation for this guide, but propose to add a reference to IAEA NS-G-1.1 Software for computer based systems important to safety of NPP.
3	55	4.13–4.24	PREPARATION FOR TESTING	Editorial.	A			Editorial
1	56	4.24 and 3.6	New bullet to 3.6 should be added: - to ensure the functioning, calibration and correct use of equipment such as testing equipment and measurement tools	4.24 states that the management system should ensure that the calibration intervals are not exceeded. This requirement should be added to 3.6 in order to describe the management system.			R	Additional bullet is not appropriate for the high level requirements of section 3.6. The detail of maintenance and

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) with comments of GRS, VdTÜV, AREVA** Pages: 22 Country/Organization: **Germany** Date: Feb, 23 2012				RESOLUTION			
Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
								calibration of testing equipment and measurement tools are included in e.g. 3.32.
3	57	4.25	last but one bullet point: "safety analysis ~~(safety analysis~~ of the NPP conditions during the test to be performed should be carried out in advance and should show the existence of acceptable safety conditions during the performance of the test~~)~~;"	To avoid unnessecary doubling.	A			Editorial
3	58	4.43	2nd sentence: "Attention should be paid to adequate monitoring of neutron flux to prevent inadvertent criticality <u>excursion</u> and if prevention fails for timely identification of such criticality."	Wording.			R	Reactivity excursion but inadvertent criticality.
3	59	4.46	2nd and 3rd sentence: "In addition, <u>subcriticality</u> checks should be performed … for subsequent loading. Predictions of the behaviour of the core in terms of its reactivity should be available for evaluation of the <u>subcriticality</u>	Editorial.	A			Editorial

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) with comments of GRS, VdTÜV, AREVA** Pages: 22 Country/Organization: **Germany** Date: Feb, 23 2012				RESOLUTION			
Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			margin."					
3	60	4.48	1st sentence: "In heavy water reactor systems … the precautions for preventing inadvertent criticality excursion during this sub stage should be specified accordingly."	Wording.			R	As above
3	61	4.49	2nd sentence: "During these tests subcriticality is required to be ensured."	Editorial.	A			Editorial
2	62	4.58	2nd sentence: "Typical steps may be 10%, 25%, 50%, 75%, 90% and 100% of full power or individual agreed steps."	Clarification. It is depending on the procedure.			R	Example is typical
2	63	4.62	2nd sentence: "… have been identified. ~~It~~ The review process should ensure that all necessary data have been obtained and analysed, and that a technical evaluation and report have been completed. It should also provide …"	Clarification. Considering the formulation of the 1st sentence, it is not clear to which phrase the pronoun "it" at the beginning of the 2nd and 3rd sentence is related.	A			Clarification
2	64	4.64	... prior to approval being granted in accordance with the regulatory body to begin the next stage....	In 2.30 the approval to begin the next stage is declared to be granted by the regulatory body. This should be mentioned in 4.64, too.			R	There are different requirements in member states.
2	65	5.1	Shortly after 3.4 a new clause needs to be inserted containing the requirement of clause 5.1 on the	This clause is a requirement to the management system and should be placed in the chapter	A			Clarification of management system

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) with comments of GRS, VdTÜV, AREVA** Pages: 22 Country/Organization: **Germany** Date: Feb, 23 2012				RESOLUTION			
Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			management system: The structure, content, extend and control of commissioning documents should be described in the management system.	MANAGEMENTSYSTEM FOR COMMISSIONING				
2	66	5.4	1st sentence: "Methods for the preparation, safe keeping, retrieval and review of documents ~~are~~ should be specified."	Clarification.	A			Editorial
3	67	5.7	2nd sentence: "… documentation including procedures and certificates to be used during ~~the~~ commissioning."	Wording.	A			Editorial
2	68	5.14	New clause shortly before 3.7: The management system should define the preparation of test procedures, including their verification and approval.	The requirement on the management system should be given in the chapter MANAGEMENTSYSTEM FOR COMMISSIONING preferably before 3.7	A	Combine with comment 65 text by adding "including their verification and approval"		Merge with response to 65.
2	69	5.15	The last sentence "The detailed content of the test procedures are in paragraphs" is not complete. Please add the missing paras.	Missing information.	A			Added reference to 4.19
1	70	5.19	"… The following types of documents may be used to certify the completion of the test or the group of the tests within the	Missing information in the subsection "Certificates" with respect to the issuance of test certificates and stage completion certificates during	A	Accepted as proposed.		

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) with comments of GRS, VdTÜV, AREVA** Pages: 22 Country/Organization: **Germany** Date: Feb, 23 2012				RESOLUTION			
Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			respective commissioning stage. A test certificate is issued to certify that the test has been completed in accordance with authorized procedures. A stage completion certificate is issued to certify that all the tests during the respective commissioning stage have been satisfactorily completed. It should also list associated test certificates."	commissioning. Para 3.32 states: "The responsibilities of the commissioning group generally should include the following: – … – to issue test certificates and stage completion certificates or their equivalent; – …"				
3	71	5.21	last sentence: "These transfers should also depend on how the responsibilities for the testing after fuel loading, at initial criticality, at low power and at power ascension ~~escalation~~ are assigned."	Consistency with the terminology used in paras 2.17 and 2.18.	A			Better description
3	72	Appendix, A.1	1st sentence: "For safely accomplishing initial fuel loading into the reactor and ensuring that inadvertent criticality excursion does not occur during the loading process, …"	Wording.	R			See above
3	73	Annex, A.8	5th from last bullet point: "equipment and controls for establishing and maintaining subatmospheric pressure in subatmospheric containments;"	Editorial.	A	Sub-atmospheric		Grammar

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) with comments of GRS, VdTÜV, AREVA** Pages: 22 Country/Organization: **Germany** Date: Feb, 23 2012				RESOLUTION			
Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	74	Annex, A.11	title of subsection: "Systems for ~~disposal~~ management of radioactive waste" 1st sentence: "Tests on radioactive waste ~~disposal~~ management systems include those designed to demonstrate the operability and to verify the performance of systems and components used to process, store and release, or to control the release of, liquid, gaseous and solid radioactive wastes, …"	Correct use of terminology. In this para, 'disposal' of radioactive waste is wrongly used as a synonym for 'management' of radioactive waste.	A	Accepted as proposed		
2	75	Annex, A.12	2nd sentence: "These may include: – integrity testing or inspection of the spent fuel storage system and its liner; – tests on cooling and purification systems for spent fuel storage facilities (including the testing of antisiphon devices, high radiation alarms and low water level alarms); – tests on refuelling equipment and fuel lifting devices (including hand tools, power equipment, bridge and	Clarification and completion. Lifting devices are needed for refuelling as well as for the handling of spent fuel casks.	A	Only to include the fuel lifting devices, and the last two bullets.		Accepted partially.

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			overhead cranes and grapples) and operability of protective interlocks and devices; – … – appropriate tests or inspections of fuel storage facilities for ensuring subcriticality; – handling test on fuel transfer flasks and fuel transfer equipment (including transfer vehicles)."					
2	76	Annex, A.19	1st sentence: "… the prerequisites for fuel loading (see paras ~~5.34–5.47~~ 4.39–4.49 and Appendix for details), open vessel tests and final checks are to be completed to ensure that …"	Paras 5.34–5.47 don't exist in the draft text.	A	Remove reference to paragraphs and appendix		
2	77	List of references	include new reference: INTERNATIONAL ATOMIC ENERGY AGENCY, Licensing Process for Nuclear Installations, IAEA Safety Standards Series No. SSG-12, IAEA, Vienna (2010).	See also comments to paras 2.30 and 3.49. The IAEA Specific Safety Guide SSG-12 should be referred here avoiding repetitions or inconsistencies. Paras 3.44–3.55 of SSG-12 specifically refer to the commissioning process.	A			Check all references
3	78	List of references	Please check the numbering of references.	Ref. [4] doesn't exist in the list of references.	A			Check all references
3	79	List of	Please check the relevance of	Ref. [5] and [6] are not cited in the	A			Check all

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) with comments of GRS, VdTÜV, AREVA** Pages: 22 Country/Organization: **Germany** Date: Feb, 23 2012				RESOLUTION			
Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		references	references [5] and [6].	draft text. Recommendations and guidance for the establishment, implementation, assessment and continual improvement of safety culture are provided in the IAEA Safety Guides GS-G-3.1 (paras 2.32–2.36) and GS-G-3.5 (paras 2.6–2.37).				references
3	80	General	Use uniform spelling in the draft text: either 'commissioning programme' or 'commissioning program'.	Editorial.	A			IAEA to adjudicate.

Comments to DS 446
Commissioning of Nuclear Power Plants

COMMENTS BY REVIEWER **Reviewer: Mr/ Moustafa Aziz** **Page.... of....** **Country/Organization: Egypt (Atomic Energy Authority)** **Date:**				**RESOLUTION**			
Comment No.	**Para/Line No.**	**Proposed new text**	**Reason**	**Accepted**	**Accepted, but modified as follows**	**Rejected**	**Reason for modification/rejection**

1	**Page 31 line No. 1**	**Preparation For Testing**	**Typing error the word Reparation should be change to Preparation.**	**A**			
2	**Para 4.15 page 31**	**The test procedures should be subject to a through verification involving the operating organization. The designers and the <u>regulatory body</u> should also participate in the approval process, in particular in reviewing the validity of the acceptance criteria.**	**The regulatory body is added to review the test procedure and the acceptance criteria because it is a safety issues.**	**A**			

Commissioning for Nuclear Power Plants DS 446
COMMENTS BY REVIEWER Reviewer: Mr Fredric Lall, Mr. D Bhattacharya &Shri S. Kavimandan, NPSD, AERB <u>Country/Organization: AERB/lndia</u> <u>Date: 10-02-2012</u>
A Pagewise Comments:

Comment No	Page/para or section/line	Proposed New Text	Reason	Accepted		Rejected	
1.	5/1.10/2	Annexure for collection of base line data of SSCs during commissioning and Hazard evaluation for each activity during commissioning should be added.	Typical baseline data to be collected during commissioning and hazard identification should be included as annexure. It will indicate the importance of collecting baseline data for systems and equipment which will be required for future reference.			R	Nor appropriate for this Standard, relates to design

2.	5/2.2/2	Add after operating group .... Regulators and Manufacturers"	Regulators and Manufacturers are missing from the list of participants of commissioning.	A			
3.	6/2.3/	Add as 3ld bullet: "Collect base line data for equipments and systems for future reference"	This is also one of the objectives of commissioning. This will be required for comparison of equipment performance over a period of time.	A			
4.	7/2.12/lastline	Modify the last line as: "and also commissioning and test proRrammes, procedures and results"	Designer should review the commissioning results to ensure design adequacy and design margin.	A			
5.	8/2.18/	Add a bullet under non nuclear testing: "Structural integrity test and integrated leakage rats test of containment structure"	Before initial fuel loading It should be ensured that containment integrity is demonstrated.	A			
6.	8/Sec2.l8	Modify the first paragraph as: "On the basis of broad range of commissioning practices in states the commissioning process can be divided in the following stages and sub-stages *to get responses of all important systems at different operating parameters."*	For completeness ▪	A			
7.	9/2.22/lastline	Add the text at the end of the bullets as a new paragraph: "Job Hazard Analysis should be carried out before carrying out each test and accordingly necessary precautions should be taken"	Necessary precautions against hazards for each activity during commissioning needs to be identified.	A			
8.	11/3.3/endof paragraph	Add: Operating group which will be maintained during regular operation should be established before or during commissioning and responsibility of operation for already commissioned systems should be handed over to operating group gradually.	Setting up operating group is an important activity which needs attention at this stage.	A			
9.	14/3.17/hefo-re 1« bullet	Add as Is» bullet; Construction group should ensure proper erections of Systems, Structures and Components have been done as per design and QA during construction has been adhered to.	Construction agency is missing from the list.	A			

10.	16/3.28/ Functions & responsibilities	Add as new para: Operating organization / licensee will be responsible for interface /co-ordination with the Regulatory body for regulatory requirements.	This requirement should be brought out clearly in the general section.	A			
11.	16/3.29/1*' line	Add : 'commissioning group 'after 'Construction group'	Handing over should be from Construction group to commissioning group and then to operation group.	A			
12.	17/3.32/8"[1] bullet	Add...'system flushing'.....also as pre operational activity.	System flushing is also carried out by commissioning group.	A			
13.	18/3.32/1*' bullet from top	Add : industrial and fire Safety in the list of Radiation, Nuclear and protection of environment)	Industrial and Fire safety aspect is also important.				
14.	19/3.32/	Add following bullets - Commissioning of Supplementary Control room Independent verification and validation of Computer based Systems Preservation during construction and commissioning - Test of First Of A Kind Systems	These activities are also carried out by commissioning group.			R	To specific
15.	19/3.33	Modify 3rd bullet as: "(Operational, Maintenance and safety as *per OLCs requirement)"*	Systems transferred for operation should be maintained as per OLCs.	A			
16.	23/3.49/1" bullet	Replace "Preliminary Final Safety Analysis Report" by "Final Safety Analysis Report (initial draft)"	To avoid confusion with Preliminary Safety Analysis Report that gets submitted for	A			
			construction license.				

17.	23/3.49/	Add following bullets: - Availability of documents related to design, training, flow sheets, electrical and instrumentation diagrams etc Status of modifications Status of transfer of systems - Availability of Work Permit system Status of Independent Verification and validation of Computer based systems (safety related systems) Fire Safety measures Commissioning of Supplementary/back up Control room Status of establishment of operating crews and licensed manpower for round the clock plant operation. Availability of contingency plans for all tests being conducted. Availability of full scope training simulator	These activities should also be completed before initial fuel loading.			R	To specific
18.	23/3.50/1" bullet	Modify second bullet as: The results of commissioning tests at rated power and their analysis	Before authorizing the NPP to continuously operate at 100% FP power, test results at 100 % FP should be reviewed.			R	Included in a set of tests
19.	24/3.55/last bullet	Add this as last bullet: Manufacturer's document indicating tests conducted, QA and QC aspects covered during manufacturing.	These documents and records are important for operating organization.	A			

20.	25/3.62/	Add as first bullet: Systems of Nuclear Power Plant	Need for knowledge of systems of NPP during commissioning should also be included.	A			
21.	25/3.62/	Add as a paragraph after last bullet: "Operators should be trained at full scope training simulator for reactor start up, regular operation, shutdown and cool down and handling of various transients.	Operators need to be trained in Simulator before licensing.	A			
22.	27/3.67/7,h	Modify the bullet as " protection against fires and internal	Internal flooding during commissioning is an	A			
	bullet from top	flooding	important aspect				
23.	27/3.67/	Add a new bullet as Software verification and validation and change management plan	Verification and validation of softwares for computer based systems should also be included.			R	To specific Superfluous
24.	27/3.68/2"« line	Delete' sub' and keep only contractors	Contractors are involved.	A			
25.	27/3.71 /6th line	Modify the 3.d sentence as....." The lesson learnt should be used in improvement and development of the commissioning programme, operating procedures, instructions *and training simulators."*	Based on commissioning experience simulator software should also be modified.	A			
26.	27/3.71 /9th line	Modify the last sentence as ....."Consideration should be given to the need for any changes in the design *and document'*	Document updating is also important.	A			
27.	28/3.73/5,h line from top	of each *equipment of plant* system....."	Maintenance of equipment is also required.	A			
28.	29/4.3/2 'line	Modify the 1« sentence as "—-The commissioning programme should be implemented consistent with the requirements of the management system *of the Responsible Organization".*	For clarity.	A			

29.	29/4.3/2'»4ine	Modify the 2nd sentence as "To this end, all contractor and subcontractors, involved in the commissioning process should ensure that their own arrangement meet the requirements of the management system of *the responsible organization.*	Same as above.	A			
30.	32/seriiil no e/3"< line	Modify the sentence as " The way in which the system to be tested is required to be brought up to test conditions should be specified and details of the test procedures should be provided, preferably in a step by step format including *data to be collected alona with the expected values,*	Format for data collection with expected values are important document to be included in commissioning procedures.	A			
31.	32/4.19/Bullet (e)	Modify the second sentence as... "This should include any temporary changes or abnormal alignments of the system or the adjacent systems *including those reported by construction* J	Inputs and observations/deviations observed during construction will have bearing on test procedure.	A			
		group.					
32.	32/after serial no i/	Adda new bullet as - *Contingency Plan:* Contingency Plan should be in place, if required, based on hazard analysis.	Contingency plan is an important part of commissioning procedure.	A			
33.	35/4.^8/ within bracket	Add: ventilation system and drainage system in the list	Ventilation and drainage systems are important systems before taking up commissioning of main systems.	A			
34.	37/4.?8/	Add as a new serial before section 4.39 under Initial Fuel Loading and Sub-critical test: Structural integrity test and integrated leakage rate test of Containment test should be satisfactorily completed before initial fuel loading into reactor core.	Structural integrity test should be completed before initial fuel loading.			R	In Annex
35.	37/4.39/last tine	Add as last sentence to this paragraph: "Special Start up instrumentation shall be provided/ installed if necessary.	For some reactor, special start up instrumentation is required for first criticality.			R	See above

36.	37/4.40/2» [d] sentence	Modify the sentence as These should include checks on coolant flow rates, instrumentation rod control mechanisms, automatic control rod insertion *or any other reactivity control system* and other important features of primary circuit.	Other reactivity control mechanism like boron shim control is also important.		A		
37.	38/4.44/1" line	Modify the sentence as .... "all preoperational tests *and pre-service inspection* doomed necessary....."	Pre service inspections should be completed before initial fuel loading.		A		
38.	38/4.47/last line	Add one new sentence as..... In case fuel and water is added in steps then water should have sufficient poison (boron/ gadolinium) to ensure required level of sub-criticality. It should also be ensured that there is no possibility of dilution of dissolved poison.	All sources of poison dilution should be eliminated.			R	Doesn't relate to the chapter
39.	39/4.51/1" line	Modify the Is" line as follows: "Before the approach to criticality is started, operability of automatic reactivity shutdown devices, *by means of two sensors with two trip set points* is required to be ensured....."	Two trip set points are required to be established.			R	To specific
40.	40/4.55	At the end of last paragraph of this section add: "The tests conducted for measurements of worth of reactivity mechanism, coefficients of reactivity etc may require some **jumperine which should** be normalised after the tests as per approved procedure".	lumpering carried out during this stage should be as per approved procedure.			R	Superfluous

41.	41/4.63/3'" line	Last sentence should be modified as "The evaluation of the test results should include a comparison with acceptance criteria and availability of design margins and analysis of any deviation detected."	Design margins should be established.	A			
42.	47/5.16/after Slh bullet	Add a new bullet: Detailed datasheets with expected values and plots of test data obtained.	Important aspects of input for analysis and understanding behaviour.	A			
43.	49/Appendix/ A.2/8''' bullet	Add these at the end of 8* bullet: - Failed fuel detection system should be available - Capability to unload failed fuel from core and store separately in a pre identified place should be available.	Capability to identify failed fuel and its storage is an important aspect	A			
44.	49/Appendix/ A-2/	I Following bullets should be added: Capability of shutting down reactor from Supplementary Control room Emergency Core Cooling System Post accident sampling system of air and water Post accident radiation monitors fwide range!	Important aspects required to be addressed before initial fuel loading	A			
45.	51/Appendix/ A.3/after 3*1 bullet from too	Add a new bullet as: Provision to measure personnel radiation dose consumption during initial fuel loading.	Required for fuels having radiation field/radioactivity.	A			
46.	51/Appendix/ A.3/№ bullet	Modify the bullet as follows: Specified limits for the quality of reactor coolant or moderator (for heavy water reactors) along with poison content	Poison content in coolant/moderator is an important parameter.			R	Too specific

	from top							
47.	52/annexe/ A.3 /Pre operational tests	Following tests should be added in the system tests - Various modes of pump operation Heat up rate, cool down rate - Vibration test of reactor internals - Sampling System - Purification system Leakage Monitoring systems Leakage collection systems	Important commissioning tests of Reactor Coolant system.				R	Already in the list
		Make up rate and blow down rates Shutdown cooling capability Emergency core cooling						
48.	59/annexe/ A.12/	Add two bullets after last bullet: Testing of leaky fuel identification system - Handling and storing of leaky fuel	Important tests to detect and store failed fuel assemblies.				R	Already in the list
Comments specially addressing commissioning of PHWR based NPPs								
49.	51/Appendix/ A.3/	Add a new bullet: In case control rods are completely inside core (as for PHWRS) secondary shutdown system with appropriate trip set point for actuation should be poised during initial fuel loading.	Availability of shutdown system with proper set point to bring reactor to sub critical state.	A				
50.	62/anm?xe/ A.20/low power tests/1* bullet	Add a new bullet: paniculate and tritium activity monitoring (in PHWR)	Important for heavy water reactors.	A				
51.	Precautions during handling of heavy water	Precautions for handling heavy water during flushing and addition to avoid spillage and degradation. Special precautions during handling of	These aspects require attention for commissioning of PHWRs	A				

		heavy water containing tritium.					
52.		Special accounting process for heavy water to avoid unintended loss/misuse.	This aspect requires attention for commissioning of PHWRs	A			
53.	Points to be considered for PHWR based systems.	Beetle Monitoring System to indicate leakage/spillage of heavy water. Drying of heavy water systems after light water commissioning to avoid degradation of heavy water's isotopic purity Addition of heavy water in PHT system after fuel loading, air hold test and helium leak test Flushing of moderator system with heavy water (containing Boron)after drying of moderator system - Addition of bulk heavy water in Moderator system after air hold test and helium leak test.	These aspects require incorporation in the guide.			R	To specific

* Word (s) in italics are newly suggested /proposed changes

B. Editorial Comments:

1.	6/23/2"* bullet	Delete : "that the facility operating procedures and" from second bullet	Editorial	A			
2.	6/2.3/l»2nd and 3ld bullet	Delete "to" from all bullets	Editorial.	A			
3.	7/2.8/last bullet/1*' line	Delete:" including whose"	Editorial	A			
4.	10/2.27/ serial a	Replace" produced" by "prepared" in the first line	Editorial	A			

5.	17/3.31/last bullet	The sentence should be as follows: .....for resolving construction related issues."	Editorial.	A			
6.	17/3.32/6» bullet	andthe operating group.	Editorial	A			
7.	19/3.33/41 " bullet	Replace 'Competent' by 'Competence'	Editorial.	A			
8.	23/3.51/1» ' line	Modify 1* sentence as "Plant handover is the transfer of responsibilities from commissioning group to operating group for the plant-	Editorial	A			
9.	27/3.67/3rd bullet from ron	Replace " Radiation" by "Radioactive"	Editorial	A			
10.	37/4.39/	Modify First sentence as.....stage of initial fuel loading.....	Editorial	A			
11.	46/5.15/last line	Sentence is incomplete. It can be deleted without any information loss.	Editorial	A			

Commissioning far Nuclear Power Plants (DS446 Draft no.l)

COMMENTS BY REVIEWER: Page 1 of 1 Country/Organization: Japan Date: 2012/2/16				RESOLUTION			
Comment .... No.------	*P* am/ Line ------ No.------	Proposed new text	Reason	Accepted	Accepted, but modified os follows	Rejected	Reason for modification/rejection
1	2.28	"The regulatory body should review and approve the commissioning programme, together with other relevant documentation, in accordance with national	As this paragraph describes the role of the regulatory body, the regulatory body should be the subject of the	A			.

		practice.	sentence.				
2	2.29	The regulatory body, together with the operating organization, should maintain a close liaison throughout the implementation of the whole commissioning programme.	As this paragraph describes the role of the regulatory body, the regulatory body should be the subject of the sentence.	A			
1	2.29&2.30	Change the order of these paragraphs.	2.30 should be prioritized.	A			
4	P.3I/L.1	PREPARATION FOR TESTING	Editorial Literal error	A	:		

Draft Safety Standards on
Commissioning for Nuclear Power Plants (DS446)

UK COMMENTS

Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
1	2.2	"..licence holder, **regulators**, commissioning and …"	Communication with regulator is part of commissioning activities.	A			
2	2.3	Ensure the plant has been conditioned to minimize the production of future corrosion and radiological products	Chemical pre-conditioning /passivation of the plant prior to active commissioning is essential to ensure low dose in future operation	A	Include both the proposed new text and the reason, as a new paragraph. "The commissioning programme should include consideration of chemical pre-conditioning / passivation of the plant prior to active commissioning. Conditioning the plant will minimize the production of future corrosion and radiological products which will ensure low dose in future operation."		Add a new § between 2.5 before 2.6

UK COMMENTS							
Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
3	2.5	Structures, Systems and Components (SSC) adequately tested off-site (to the satisfaction of the participating parties of the commissioning process) are to be subject to further testing on-site, to ensure compatibility with installed systems within the power plant. Examples of installed systems are ventilation, cooling, electrical, computer controlled, monitoring, and radiological detection systems.	Reworded to aid clarity.			R	Proposal is contrary to the intent of the original paragraph.
4	2.8 3rd point	The tests are grouped in the following typical logical sequential stages • testing of individual components and system tests during non-nuclear testing stages • overall integrated system tests, during non-nuclear testing stages • testing of components and systems during nuclear testing stages • overall plant testing stages	Presents an unambiguous approach to the test sequence.			R	The proposed structure does not improve the clarity
5	2.8 para 5	Operations, maintenance and support personnel are trained and processes and procedures are validated.	More than just the future operating teams should be involved to validate the processes and procedures	A			Accepted

UK COMMENTS

Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
6	2.10 5th point	Provision for data collection for further use, **and the requisite record retention period.**	If records of commissioning are required under license conditions, the retention period should be stated.			R	This paragraph deals with the requirements for data collection. Records are dealt with in the Management System
7	2.16	"…not been completed. **The impact on safety of incomplete or omitted tests is to be given due consideration before proceeding with further testing.** "	Emphasizes the need to consider the impact of tests not yet conducted. Such consideration may lead to the omitted tests being undertaken before proceeding to the next phase of commissioning.	A			Accepted
8	2.19	"…external conditions such as **supporting systems and supporting facilities** availability,…"	Provides a better scope of points for consideration than just the consideration of the grid availability.	A	"…external conditions such as **supporting systems and supporting facilities** availability. (For example grid availability, water treatment, etc.)"		Accepted with amendment
9	2.19	These adjustments must be controlled to ensure the same level of review as the original sequence is carried and respect of conditions and a common agreement of commissioning and operating organisations	Adjustments to the test sequence should be subject to the same standard of scrutiny as the original sequence so that changes do not introduce unnecessary additional risks to safety etc.	A	These adjustments must be controlled to ensure the same level of review as the original sequence ~~is carried~~ and respect of conditions and a common agreement of commissioning and operating organisations		Accepted with correction
10	2.24 1st point 2nd point	"…**identified** systems should have prior testing. …**identified** systems should be operational…"	The word "certain" seems rather vague in this context.	A			Accepted

UK COMMENTS							
Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
11	2.27 Point "b"	"…can be met for the design intent of each unit, **and that the design intent is satisfied for each individual unit when all units using such a system are operational. This should also be the case where accident conditions in individual and multiple units can be tested.**"	Specifies the overall requirements for a site.	A			Accepted
12	2.27	Special provisions including adequate communications to ensure…….	The communications need to be 2 way, such that the operating unit, though taking priority, does not jeopardize safety of the commissioning unit either.	A			Accepted
13	2.30	The regulatory body should decide whether the licensee may proceed to specifiied stage/sub stage of the commissioning program during the implementation commissioning program. Such permissioning/authorization should occur at specified hold points or milestones, based on the evaluation of test results, appropriate reports prepared by the licensee and onsite inspection activity.	Sentence restructured to remove ambiguity.	A			Accepted

UK COMMENTS							
Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
14	3.9	"The licensee should implement adequate arrangements within a Management System to ensure…	Parenthesis added to aid readability.	A			Accepted
15	3.22 2nd point	"…availability of necessary resources (personnel, **support systems, emergency resources**, and materials)…	Support systems include electricity, water, steam, turbine plant, condensers, etc.	A			
16	3.22 New point	To ensure that the plant responds as required when testing is completed.	It is important that the plant shuts down in the anticipated manner as required by the safety case.			R	Proposed bullet is not related to paragraph 3.22
17	3.29	Add "Such transfers are to be recorded."	This ensures transfer of ownership of systems can be shown to regulators.			R	This section is not on process
18	3.31 4th point	FSAR is not defined.	Any abbreviations/acronyms should appear after the full title (eg Commissioning Test Group (CTG)), otherwise reader may misinterpret abbreviation.	A			Accepted
19	3.31 para 2	To make suitable arrangements for surveillance, preservation and maintenance to prevent……	Preservation of plant during commissioning or in the event of a delay is a significant risk that needs to be managed	A			Accepted
20	3.31 para 5	……Final Safety Analysis report (FSAR)….	typo	A			Accepted

UK COMMENTS							
Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
21	3.32 para 19	For controlling, recording and communicating of temporary changes to plant and equipment	The operators need to be aware at all time of the configuration of the plant they may be operating on behalf of commissioning	A			Accepted
22	3.32 Para 27	…… responsibilities for operation and maintenance for systems…..		A			Accepted
23	New Para	To establish a process for the transfer of records under the overall control of the licensee	Commissioning data and records are a critical part of the station lifetime records and need to be handed over to operations.			R	Refer to 3.51 to3.55
24	3.33 2nd point	"..the design intent and safety **and regulatory** requirements."	There is a need to ensure regulatory requirements are taken into account.	A			Accepted
25	3.33 new para	Supply specialist advice on operational requirements during the commissioning phase	Certain parameters and configurations may develop and be changed as commissioning develops operations need to input their requirements to these changes			R	Not a responsibility

UK COMMENTS

Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
26	3.44 para 5	…..considered commissioning milestones and ……	typo	A			Accepted
27	3.44 para 12	Procedures for radiological zone mapping, monitoring and protection…..	The opportunity to map radiological conditions/ hotspots etc. during later commissioning will be useful data in operation & maintenance	A			Accepted
28	3.55 new para	Statutory certificates	For completeness	A			Accepted
29	3.55 new para	Regulator correspondence	For completeness			R	Included in general correspondence
30	3.67 bullet 18	Replace “protection against environment” by “Environment Protection”	Original wording infers protection of the site from the environment. The revised wording infers consideration is given to protecting the environment from commissioning activity	A			Accepted
31	3.67 new line	Training	For completeness	A			Accepted
32	4	The commissioning programme should include any interfaces with other non commissioning activities i.e. construction completion activities	To optimise safety considerations the construction /commissioning /pre-operations plan need to integrate correctly			R	Is included in section on Interfaces 3.35 onwards.

UK COMMENTS							
Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
33	4.16	Add extra sentence "**Such amendments are to be reviewed, authorized and recorded.**"	This is to ensure due consideration of such changes.	A			Accepted
34	4.18	It may be advisable to add a comment about keeping a time-based log of such deviations/changes.	This is to ensure that such operations are duly recorded in the event of an incident.			R	Too detailed for the Safety Guide
35	4.19 Point j	Add "…systems have been returned to normal conditions, **or the anticipated condition at the end of the test.**"	There may be further testing to take place from a temporary position, while the results are analyzed.	A			Accepted
36	4.25 new para	Any 'off normal' settings of alarms or trips	For certain tests the alarms may be set higher or lower than operational this needs to be justified and recorded in the pre-reqs.			R	Adequately covered in existing clauses e.g. bullet 4
37	4.28 point 2	Change to read "**Specific** support systems (e.g. compressed….."	The word "certain" has ambiguous meanings.	A			Accepted
38	4.28 point 2	Change to read "…so that they are available for the full testing of other systems."	The word "proper" could be interpreted that other tests are not properly conducted.	A	"…so that they are available for the ~~full~~ testing of other systems."		Accepted with proposed change
39	4.28 point 3	Change to read "**Specific** systems should be operational….."	The word "certain" has ambiguous meanings.	A			Accepted
40	4.29 point 3	Change to read "..that test equipment and instruments **and supporting systems**…."	Services such as electricity, ventilation, etc may be required to conduct the tests.			R	Doesn't apply to the clause on instrumentation

UK COMMENTS							
Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
41	5.15 last sentence	Sentence incomplete		A			Been resolved under other review.
42	Appendix A.2 new para	Control and segregation of any moderating material	Uncontrolled/unplanned introduction of moderating material or chemicals ie oil will challenge the calculations for shutdown margin	A			Accepted
43	Appendix A.2 new para	Status of the plant cleanliness	Any contaminants/material left in the reactor at this point could become activated and challenge radiological conditions	A			Accepted
44	Appendix A.14, point 5	…. filters, absorption filters and delay beds	For completeness	A			Accepted
45	Appendix A.15, point13	….used for achieving and maintaining safe shutdown	For completeness	A			Accepted
46	Appendix A.20, point 23	….cleanup and off-gas systems……	For completeness	A			Accepted
47	Appendix A.21, point 12	Radiation surveys and mapping to……	Mapping for future RP optimisation during maintenance.	A			Accepted
48	Appendix/Annex	Paragraph numbers for both sections start at A.1.	Should use different paragraph numbers to avoid ambiguity.			R	Rejected. Rules for Guideline

UK COMMENTS							
Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
49	General Note	Although waste generated during commissioning is mentioned in later sections of the document, it may be necessary to include details of the responsibilities of various parties to deal with such waste within the main body of the document.	The issue of ownership for care of conventional (including chemical) and radioactive waste generated during commissioning should be mentioned throughout the earlier sections of the document.			R	National regulations on environmental will take precedence.
50	General Note	If refueling of the reactor is a requirement of continuing operation of the plant, should this be a consideration for the various groups undertaking the commissioning operations.	Could impact on tests undertaken during commissioning.			R	Refuelling is excluded from commissioning
51	General Note	The document requires a grammar/sentence “construction” check, as some sentences appear ambiguous/confusing on first reading.		A			Final check by secretariat
52	General Note	There is no mention of software configuration management and control during commissioning	This is a large subject that I believe an explicit paragraph should be written.			R	The aspects of software for computer systems important to safety is covered in NS-G-1.1
53	General Note	There is no mention of the use of simulators for the testing of commissioning and operations procedures and processes prior to use on site	Use of simulator in pre-running tests and preparing staff is invaluable			R	See section 4.17

UK COMMENTS							
Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
54	General Note	There is no requirement for the commissioning results and findings to be fed back to the station operational simulator to ensure fidelity of the simulation models	The simulators should updated to reflect the responses found in the commissioning tests	A	Some reference is necessary to including the simulator and training material.		Consider including reference to the need to maintain configuration control of the simulator and training material in §3.71.
55	General Note	As a guide it provides a great deal of information for an operating organisation in setting up a commissioning programme. The stages it goes though are sequential as per the actual commissioning process, covering initial installation through to core load and on to power operation tests.	The document is a guide, and not a “how to” document.	A			No action required

UK COMMENTS							
Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
56	General Note	What it would benefit from is a couple of diagrams showing example organisations for the commissioning manager and the operations manager, and the interfaces between the two during the commissioning phase.	The document alludes to the relationships, but it would be clearer with a chart or two.			R	Too late in the process to initiate appropriate charts
57	General Note	A high level sequence diagram would be useful	Similarly with the logic of the entire process. It's obvious that the sequence is dictated by the build and the nature of the plant, but a high level sequence diagram would be useful – particularly for those organisations that haven't done this type of activity before, or not done it for some time (that probably includes every country in the Member States!!).			R	Too late in the process to initiate appropriate charts

UK COMMENTS							
Comment Nr	Para Nr. & Line	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification / rejection
58	General Note	It should be the baseline document for the new build stations in the UK.	The overall impression is that this is very useful, some good hints and a number of aspects that could easily slip the mind of a busy commissioning team. It should be the baseline document for the new build stations in the UK. To respond to the specific questions raised by the ONR:	A			No response required
59	General Note	There is little detail or mention of the hydrostatic testing and flushing of systems.	The scope and completeness of the document is adequate but there is little detail or mention of the hydrostatic testing and flushing of systems, leaving that to the design aspects to state those requirements in test procedures.	A			No response required
60	General Note	A small glossary for the few acronyms within the body of the document would be useful.	The document could be improved by adding this glossary.			R	IAEA include in the separate safety glossary