

***Ageing Management and Development of a Programme for Long Term Operation of Nuclear Power Plants
(DS485)***

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Page.... of.... Country/Organization: Czech/SUJB Date: 19. 11. 2015							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1. does it mean generally replaceable components or those, which are regularly replaced (active parts?)	5.17 items that are subject to periodic replacement or scheduled refurbishment can be excluded from the scope...	Items that are subject to periodic replacement or scheduled refurbishment on the basis of predefined rules can be excluded...	Clearly define rules for excluding components from the scope	X			
2. some of plant programmes don't necessarily meet all of 9 attributes (for example, if some programme is - for example condition monitoring programme, it doesn't include preventive or mitigating	5.46 All newly developed programmes... ...with nine attributes of Table 2	All newly developed programmes... ...with nine attributes of Table 2. If programme is of such a nature that doesn't meet all of the 9 attributes, it should be properly commented.		X			

action, it should be properly commented or explained							
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Armenia - Comments to DS485 - Ageing Management and Development of a Programme for Long Term Operation of Nuclear Power Plants

Comment No.	Para/ Line No.	Proposed new text	Reason	Accepted	Reason for modification/rejection
1.	3.9	3.9 In the design phase, the following should be ensured: ... - Materials testing programmes for periodic monitoring of ageing effects during plant operation are implemented taking into account problems related to materials accessibility	At the stage of design it is important to ensure that no obstacles exist for further implementation of AMP. Particularly the attention should be paid to accessibility issues during periodic monitoring of ageing effects.	X	
2.	5.15	5.15 The following SSCs should be included in the scope: - SSCs that are recommended to be included in AMP based on investigation of international and/or national best practice - SSCs that are important from the view of electricity production	Presented criteria for SSCs selection do not cover such issues as investigation of best practice of SSCs scoping and SSCs that are important from the view of electricity production. Mentioned aspects could expand AMP scope by SSCs that are not covered by already presented criteria.		Criteria for scoping must be focused in safety. The IAEA safety standards represent international best practice. MS are allowed to add additional SSCs based on national requirements or electricity production.

3.	5.55	<p>5.55 To evaluate effectiveness of the AMPs, performance indicators should be developed and used by the operating organization. Examples of such indicators are:</p> <ul style="list-style-type: none"> - ... - Number-Percentage of recurrent ageing driven failures and instances of degradation; - ... 	<p>Actually, it is possible to have increasing overall number of recurrent failures due to the possible increase of overall number of failures at the plant. Therefore in order to evaluate effectiveness of AMPs it is important to monitor the percentage of recurrent failures (not the number) that are driven by ageing effects.</p>	X	
4.		<p>5.55 To evaluate effectiveness of the AMPs, performance indicators should be developed and used by the operating organization. Examples of such indicators are:</p> <ul style="list-style-type: none"> - ... - Number of newly discovered ageing effects/ degradation mechanisms; - Number of newly developed AMPs. 	<p>Actually it is possible that not many new ageing effects and degradation mechanisms are discovered during implementation of AMPs, however this fact could not be treated as ineffectiveness of AMPs. It is more important to pay attention on overall feedback from operational experience and in-service inspections to the list of ageing effects/ degradation mechanisms and appropriate AMPs. From this perspective the numbers of discovered ageing effects/ degradation mechanisms and newly developed AMPs could not be treated as an individual indicator effectiveness of the AMPs, performance. Hence more qualitative insights are necessary to evaluate effectiveness of the AMPs.</p>	X	

COMMENTS BY REVIEWER					RESOLUTION			
Reviewer: Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) (with comments of GRS) Country/Organization: Germany					Page 1 of 5 Date: 2015-10-28			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification /rejection
3	1	Contents	"... 3. AGEING MANAGEMENT THROUGHOUT THE PLANT LIFE ... LONG TERM OPERATION <u>LONG TERM SHUTDOWN</u> <u>DECOMMISSIONING</u> 4. RELEVANT PLANT DOCUMENTATION AND PROGRAMMES ... 5. MANAGEMENT OF AGEING ... SCOPE SETTING OF STRUCTURES, SYSTEMS AND COMPONENTS <u>AGEING MANAGEMENT REVIEW</u> AGEING MANAGEMENT PROGRAMMES TIME LIMITED AGEING ANALYSES <u>DOCUMENTATION OF AGEING MANAGEMENT</u> 6. MANAGEMENT OF	Four subsections of Section 3 and Section 5, respectively, are missing in the list of contents.	X			

			TECHNOLOGICAL OBSOLESCENCE ...”					
3	2	1.9	“The objective of this Safety Guide is to provide recommendations for addressing meeting the SSR-2/1 [1] Requirement 30: Qualification of items important to safety, Requirement 31: Ageing management and SSR-2/2 [2] Requirement 14: Ageing management and Requirement 16: Programme for long term operation.”	More appropriate wording.	X			
2	3	2.18	“Ageing management programmes (AMPs) are developed consistent with using a structured approach methodology , to ensure a consistent approach for defining and implementing ageing management, as described in Section 5.”	Clarification. The original text contains circular wording (“... developed consistent with using a structured approach, to ensure a consistent approach ...”) that should be avoided in order to facilitate understanding.	X			
3	4	3.8	3 rd sentence: “ Reference [1] , Requirements 30 and 31 of [1] establish the design related requirements on ageing management of	Wording adjusted to harmonize citations of overarching requirements in the Safety Guide (see e.g. Paras 3.3 and 4.24).	X			

			SSCs important to safety.”					
2	5	3.9	1 st bullet: “The operational states and accident conditions are taken into account in equipment qualification (EQ) programmes;”	The abbreviation ‘EQ’ should be introduced here since it is subsequently used in Para 3.14 (last bullet).	X			
1	6	3.37	“ <u>Between the permanent shutdown of operations at the reactor unit and approval of the final decommissioning plan, there may be a period of transition.</u> During the <u>this</u> transition period s from reactor unit permanent shutdown to final decommissioning and, where required, to facilitate decommissioning, appropriate ageing management arrangements should be evaluated to ensure that required SSCs remain available and functional. ...”	The original text is misleading. The transition period begins with the permanent shutdown of operations and ends with the granting of the decommissioning licence or with the approval of the final decommissioning plan by the regulatory body. During this period, some preparatory actions for decommissioning may be carried out under the operating licence. However, there is no additional transition period to facilitate decommissioning. Consequently, the plural	X			

				form in Para 3.37 is meaningless. Compare with Para 7.8 of the Safety Requirements GSR Part 6 “Decommissioning of Facilities” as well as with Paras 7.16 to 7.19 of the Draft Safety Guide DS452 “Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities” (latest version dated 28 August 2015; revision of WS-G-2.1 and WS-G-2.4).				
3	7	3.38	“... (e.g. long-term integrity of SSCs to prevent its <u>their</u> deterioration and ensure safe dismantling, handling, and transport of components before license termination; ...) ...”	Grammar.	X			
3	8	4.6	2 nd bullet: “Thoroughly documenting the actual condition of each SSC important to safety documenting thoroughly the condition of each SSC important to safety (Safety Factor 2). Knowledge of	There is an inadvertent duplication of text in this bullet.	X			

			<p>any existing or anticipated obsolescence ...”</p> <p>4th bullet:</p> <p>“The effects of ageing on nuclear power plant safety, the effectiveness of AMPs and the need for improvements to AMPs, as well as the obsolescence of technology used in the nuclear power plant is <u>are</u> part of such assessment (Safety Factor 4).”</p>	Grammar.				
3	9	4.7	<p>“If national requirements do not require PSR, an alternative routine comprehensive safety assessment that <u>meets</u> the objectives of the PSR [8] and <u>achieves</u> the equivalent outcomes as those of the PSR should be performed.”</p>	Grammar.	X			
3	10	4.31	<p>1st sentence:</p> <p>“<u>According to Requirement 13 of [2],</u> tThe review of equipment qualification should include an assessment of the effectiveness Requirement 13 of [2] of the plant’s equipment qualification programme.”</p>	<p>Clarification.</p> <p>The reference to SSR-2/2 is misplaced in this sentence.</p>	X			

2	11	5.13 to 5.21	<p>Within the subsection “Scope setting of SSCs” (Paras 5.13 to 5.21), the terms ‘structures and components’ (SCs) and ‘systems, structures and components’ (SSCs) are used. A clarifying statement regarding the distinction between SSCs and SCs in the scope setting process would be helpful.</p>	<p>The use of both terms in this subsection gives rise to confusion and, therefore, should be clarified.</p>	X			
3	12	Table 2 (p. 33)	<p>Note: The first three references to Table 2 are already provided in the subsection “Ageing management review”, Paras 5.25 (p. 27), 5.31 and 5.32 (p. 29), while the table itself is presented much later in the subsection “Ageing management programmes” (p. 33). This indicates that the table is unfavourably placed in the document. Shifting of Table 2 to the subsection “Ageing management review” should be considered.</p>	<p>Our proposal aims for improving the user-friendliness and readability of the Safety Guide.</p>	X			
2	13	5.63	<p>“TLAAs should meet all six of the following criteria [5]:</p> <ol style="list-style-type: none"> 1. <i>Involve systems, structures, and components within the scope for ageing management.</i> Scope setting is described in Para 5.13 to 5.21 and illustrated in Figure 3. 	<p>It is more appropriate to say scope setting of SSCs is illustrated in Figure 3 rather than it is described there. Description / explanation is provided in Paras 5.13 to</p>	X			

			2. ...”	5.21.				
2	14	5.70	“The documentation should include a <u>final safety analysis report (FSAR)</u> update reflecting the assumptions, activities and results of the plant programme for ageing management.”	The abbreviation ‘FSAR’ is used in Paras 5.70 and 7.35 but is nowhere introduced in this Safety Guide.	X			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: WASSC Country/Organization: South Africa/ NNR & Eskom Date:12/11/2015				Page....of....			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Various sections of the document	General comment: Ensure the font is the same through all the various paragraphs of the document	Editorial Consistency	X			
2	1.2	Ageing management for nuclear power plants means that ensuring the ageing effects will not prevent affected systems, structures and components (SSCs) from being able to	Propose to change “service life “ to “life” to align with definition of life of plant. See the IAEA Glossary	X			

		accomplish required safety functions throughout the life of the plant (including decommissioning), with account taken of changes that occur with time and use [1].	definition of Service Life. The definition is very specific and doesn't apply to the paragraph 1.2.				
3	1.3	Ageing management is most effective when it is properly taken into account the life of a Nuclear Power Plant .	See the IAEA Glossary definition of Service Life. The definition is very specific and doesn't apply to the paragraph 1.3.	X			
4	1.10	The safety guide provides good international practices on establishing, implementing and improving ageing management and development of a programme for safe LTO for nuclear power plants	Editorial: the text should read as of a instead of ofa	X			
5	1.14	This Safety Guide is intended to provide recommendations on ageing management and development of a programme for LTO for nuclear power plants. This Safety Guide also includes facilities for spent fuel storage and radioactive waste management which are part of the nuclear power plant .	For consistency nuclear power plant is used through the entire document.	X			

6	2.10	<p>Effective ageing management is in practice accomplished by coordinating existing plant programmes and processes (or elements thereof which impact on ageing)....</p> <p>or ...(or elements thereof which are relevant to ageing) and external programmes such as research and development, as well as implementing coordinating or taking credit for other specific actions as described below.</p>	Expand sentence to be more detailed.	X			
7	2.2	It occurs due to physical or material degradation processes. (ie chemical and/or biological)	Ageing is based on physical or material degradation processes. Sentence reworded for clarity.	X			
8	2.8	Ageing management covers all activities to appropriately prevent or control ageing effects within acceptable limits through the entire life of the nuclear power plant i.e. in design, fabrication/ construction, commissioning, operation including LTO, decommissioning including long term shutdown as described in Section 3.	Same comment as number 2.	X			

9	2.11	Effective ageing management throughout the life of SSCs requires...	Change "service life" to "life". Same explanation as number 2	X			
10	2.14	The DO activity in Figure 1 means minimizing (preventing and mitigating) expected ageing effects of SSC's .	Remove degradation mechanisms. Ageing effect is degradation. It is redundancy.				Please see SRS 82 IGALL. It provides clarification of difference between ageing effect and degradation mechanism – e.g. Table 8 - list of ageing effect and Table 9 – list of degradation mechanisms.
11	2.15	The CHECK activity in Figure 1 means the timely detection and characterization ageing effects through inspection and	Remove degradation mechanisms. Ageing effect is degradation. It is redundancy.				Please see comment 10.
12	3.2	Regulatory requirements for ageing management should be established and guidance should be developed to ensure that the operating organization of a nuclear power plant implements an effective ageing management programme at each stage of the life	The sentence was not completed, the word programme was missing.				Ageing management is broader than AMP. Please see section 2, para 2.18 and other.
13	3.6	The ageing management activities	Same explanation as	X			

		should be overseen by the regulatory body throughout the life of Nuclear Power Plant	comment 2.				
14	3.9	Relevant actions are taken to make inspections and maintenance possible for SSCs over a life.	Change "service life" to life. Same explanation as number 2.	X			
15	3.16	The operating organization should verify that the environmental conditions are consistent with those considered in SSC design. Special attention should be paid to identification of hot spots in terms of temperature and levels of radiation	The correct terminology is levels of radiation instead of dose rate.	X			
16	3.19	systematic approach (see Figure 1 in Section 2) should be applied to manage ageing and obsolescence of SSCs, to ensure that required intended functions are maintained at all times during the operation phase of the life of nuclear power plant.	Same explanation as comment 2	X			
17	3.31	Concerning ageing management, the operating organization should review and validate the existing programmes and processes (or elements thereof)	Either say "all in-scope" or "that have an impact on the performance of systems important to	X			

		which impact on ageing for SCs that have an impact on the performance of systems important to...	safety". These are the same thing.				
18	3.32	Since LTO is operation beyond the originally established or nominal timeframe for operation and LTO evaluations are based on assumptions,	For clarity expand definition of LTO.				It would not be consistent with IAEA definition of LTO in SSR 2/2.
19	3.20	The operating organization should ensure programmes and documentation relevant to the management of ageing (see Section 4 and 5) and technological obsolescence (see Section 6) are implemented during the operation phase of the life of nuclear power plant	Same explanation as comment 2.	X			
20	4.10	All modifications of SSCs, releases of process software, operational limits and conditions, set-points, instructions and procedures should be properly documented and retained in an auditable and retrievable form.	Reworded for clarity.	X			
21	5.16	Delete paragraph	Information is covered in 5.17		Para 5.17 provides further clarification for statement in para 5.16. 5.16.		

					and 5.17 were combined to avoid repetition.		
22	5.39	Plant programmes or processes relevant to ageing and, of course, AMPs should include one or more four types of activities:	Reworded for expand for completeness and clarity..	X			
23	5.42	The Plan Box should be moved up a bit.	Format	X			
24	5.63 (4)	General comment: the criterion is difficult to follow. Also why "as required by national regulations"? Rather say "applicable regulations".	Consider rewording to make the regulation should be follow more generic.				This criterion is used in IGALL SRS 82 for definition of TLAA scope. It would not be wise to modify after 6 years of work on IGALL TLAAs.

COMMENTS BY REVIEWER				RESOLUTION			
Country/Organization: FRANCE		Date: 20/11/15					
pages							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection

1	<p>The use of the terms "maintenance", "repair", "in-service inspection", "surveillance" ... should be checked and clarified in all the document.</p> <p>For example:</p> <ul style="list-style-type: none">• According to 2.12-5th bullet, surveillance is include in maintenance and, just after, in figure 1 (or in 4.18), maintenance programs <u>and</u> surveillance programs are expected• 3.24 recommends appropriate maintenance and repair while repair is including in maintenance in 5.10 (consistently with IAEA safety glossary)		X			
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2	2.6	<p>To maintain plant safety it is very important to detect the ageing effects on SSCs (i.e. net changes in characteristics) timely early to address associated reduction in safety margins and to take appropriate corrective actions to ensure that required safety</p> <p>functions of systems, structures and components are fulfilled over the entire operating lifetime of the plant.</p> <p>before safety functions are impacted.</p>	<p>.The concept of "early" is not clear</p> <p>."reduction of safety margin" is not clear: there should not be any reduction for some margins and it could be acceptable for some other ones.</p> <p>.According the current guide, corrective actions are not the only way to deal with ageing</p> <p>. Proposal more consistent with requirements 14 of SSR-2/2 and 31 of SSR-2/1</p>	X			
3	2.9	<p>Ageing management consists of design, operations and maintenance actions to prevent or control, within acceptable limits, the ageing of SSCs. It is an interdisciplinary activity that involves engineering, maintenance, surveillance, equipment qualification, in-service inspection, safety analysis and other relevant plant programmes. Reference [6] provides guidance on maintenance, surveillance and inspection practices</p>	<p>The list is confusing: it is said that AM consists of 3 terms then some of them are repeated and other ones are added. Thus, the list provides no guidance</p>				<p>In first sentence we talk about type of actions (design, operations and maintenance) and in second about relevant plant programmes.</p>

4	2.27	Management of obsolescence is normally a part of the general approach for enhancing nuclear power plant safety through ongoing improvements of both performance of SSCs and safety management	Obsolescence management is a full part of ageing management. The word "normally" could be confusing	X			
5	2.31	The plant's programme for LTO is a set of activities, including evaluations, assessments, maintenance, inspections and testing aimed at justifying and demonstrating plant safety during the period of LTO	It should be enhanced that LTO has a very large scope See also comment 1 (there could be a need to add other terms depending the answer to comment 1).	X			
6	3.9	Appropriate Advanced materials with adequate greater ageing resistant properties are used;	This sounds like a new requirement and does not provide any guidance: it could not be demonstrate that materials are sufficiently advanced	X			

7	3.23 – 3.24	<p>The operating organization should ensure the timely detection and characterization of significant ageing effects through inspection and monitoring of in-scope SCs, and the assessment of observed ageing effects to determine the type and timing of any corrective actions required.</p> <p>3.24. The operating organization should ensure corrective these actions are performed. followed or taken to prevent/ mitigate or correct ageing effects of SCs through the appropriate maintenance, repair and replacement or modification of a SC, and / or appropriate changes to relevant plant operations, programmes and documentation</p>	<p>· corrective actions are not the only necessary actions</p> <p>· 3.24 is not understandable: corrective actions to prevent/mitigate/correct? Change to documentation could be sufficient?....</p>		<p>“Correct” and “corrective” is removed from 3.23. and 3.24.</p>		
8	4.44	<p>Surveillance programmes using representative material samples (such as reactor pressure vessel material surveillance specimens, cable deposits, corrosion coupons etc.) should be reviewed and extended or supplemented for ageing within LTO, if necessary</p>	<p>To clarify that the objective is ageing not LTO in general</p>	X			
9	5.16- 5.17	<p>Consider deletion or gathering or complementary explanations</p>	<p>5.16 and 5.17 seems to be redundant</p>	X			
10	5.21		<p>Not understandable</p>				<p>Discussed with IAEA language services and it is clearly defined.</p>

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Maria Magdalena Gris Cruz Country/Organization: Mexico/CFE-Laguna Verde				Date: 2016-02-08			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	I made some editorial corrections (spaces between words mainly)	I do not know if it was a problem with the software version, the document was misconfigured and I tried to correct it.	X			
2	2.2	What's the difference between physical and material degradation?	I do not have clear the term physical degradation in my opinion is the same meaning of material degradation.		Clarified.		
3	2.11	Last two lines can be rewritten together parag.2.12	I think it is repetitive	X			
4	2.12	Bullet 9: could be External in place generic?	in my understanding, the use of the term; external for referring	X			

			other plants operating experiences is more common				
5	2.13 to 2.16	In my personnel opinion we can delete "in Figure 1" of the paragraphs	It is clear that is a description of the figure content.			X	We would like to keep clear connection with Figure 1.
6	2.17	Second line, it is not clear the meaning of "research and development" in this case.	At what level of research and development is referring, nuclear industry or plant?				
7	2.21	First line; I think could be clearer if we say "component type" which means for example, valve bodies, pump cases, piping components, etc	It could be confused that the evaluation is made at individual component level.			X	Not clear where the change should be written.
8	2.23	I propose: "the first parameter is the time dependant variable which is used in the analysis. Examples of this include neutron fluence, operating time or number of thermal cycles on a component. The second parameter evaluated is the ageing effect associated with the first one, that could include neutron embrittlement of vessel material, thermal embrittlement of CASS and cumulative fatigue usage respectively. Both parameters are	I think it is clearer.	X			

		evaluated and compared with regulatory limit or criterion to determine acceptability of the component for service”					
9	2.25	Second line; “the associated decrease in the reliability or availability of SSCs occur”	In my opinion for a clearer description of the idea.	X			
10	3.11	Second bullet; how could be addressed this? At what level (component type?) in our case we identified more than 10 thousand SSCs per unit. We just inserted the summary of AMP’s in SAR with an explanation of which effects on what systems address ageing.	For a clearer description of the idea		Not on component level but sufficient description.		
11	3.11	It is not clear for me how much information should be included in SAR, I guess that the idea is to include general information about all topics described in this point.	It seems that there would be to make a big SAR modification. In our case we just included an appendix in SAR with a summary of the evaluation.	X			
12	3.34	Third bullet “review of effectiveness of AMP’s and...”	I think it is a better description.	X			
13	4.18	d) Surveillances	Plural is better.			X	We use singular.
14	5.3	Second line; “...ageing management as is	Redaction			X	

		specified in..."					
15	5.25	First bullet; "...based on fundamental or basic knowledge..." Third bullet; "...degradation mechanisms are being managed..."	I think is clearer	X			
16	Table 2	I tried to correct but it was not possible	It is misconfigured	X			
17	6.1	Second line; "...before associated decrease in reliability and availability occur..."	Sounds better, I think	X			
18	6.12	"...Detailed information..."	Redaction.	X			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: B Svensson, R Waginder, C Lundqvist Country/Organization: Sweden, Ringhals NPP				Date: 2015-05-19			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
General comment		The meaning of "LTO" when used in this document ought to be defined and applied consistent. It seems that the meaning of the word "LTO" in this document varies.	1/ a Project aimed to verify/demonstrate the safety during long term operation				

			<p>2/ The process to identify all activities to be performed during the long term operation</p> <p>3/ The process to identify additional activities to be performed during the long term operation</p>				
General comment		The mix of AMP and LTO in the same document will not serve its purpose to clarify AMP and LTO.	Most aspects of AMP are relevant within LTO, but LTO includes other topics such as SAR, CM/DM, safety modernisation and PSR that are not related to AMP. Also, AMP is related to other areas such as maintenance that are not treated in DS485. The NS-G-2.12 and SR-57 have served their purpose well as separate documents.			X	Task of „Long term structure of the IAEA Safety Standards“ that a new revision of NS-G-2.12 „...will also address the issues related to long term operation ...“ should be addressed.
General comment		Wish for more detailed guidance or practical examples in some respects.	We have found it difficult to conclude the appropriate level of			X	We cannot provide practical examples on the level of Safety

ent			detail in scoping & screening and to define how active components in AMP and AMR are best treated. It would be appreciated to have more support from the document in these respects. Perhaps as practical examples on what other operators have done.				Guide. It is a task of IGALL Safety Report for AMR, AMP and TLAAs and future revision of SRS 57 for scoping. Active components will be treated by AMPs or other plant programmes depending on decision of NPP (see Fig. 4 and Fig.8).
General comment		Figure 4 in existing document is not included in the new updated version. The figure is illustrative and ought to be reused.				X	This part of the Guide was significantly changed and figure is not suitable. Originally it was mixture of AMR and review of AMPs.
1	1.5	(LTO-see Section 7)	Section 2 should be changed to Section 7 ?		Reference to LTO definition should be provided (para 2.30).		
2	1.8	Clarify the role of safety report 57	There is a lack of information regarding if DS485 will supersede safety report 57 or not.		Link to SRS 57 is provided in para 7.1 While this Safety Guide is		

			To my understanding there is a lot of overlap between these documents which can create confusion.		published, SRS 57 will be revised to provide more detailed guidance and good practices as you request in your general comments.		
3	1.13/3	Outside the scope of this safety guide	Aspects related to safe LTO is intentionally left outside the scope. Is it possible to give reference to documents were this is treated, otherwise it can be interpreted that this safety guide will not result in safe LTO.	X			
4	1.15/6	Operation period (i.e operation, long term operation, long term shutdown ...)	Clarify when section 5 should be applied.	X			
5	1.15/8	It is suggested that chapter 7 is	Long term operation is a			X	In section 7 we

		incorporated as a sub chapter to chapter 5	special case of normal operation. Since chapter 5 is stated to cover any operating period, it should also cover LTO.				identified particular activities connected with preparation for safe LTO. We use links to other section whenever possible.
6	2.12		Paragraph 2.12 ought to be directly below the title AGEING MANAGEMENT The order of paragraph 2.6 – 2.24 ought to be reconsidered.	X			
7	2.3	Non-physical ageing is the process of becoming out of date (i.e. obsolete) owing to the availability, evolution of knowledge and technology and associated changes in requirements, codes and standards.	Availability ought to be included in the sentence	X			
8	2.6		The order of paragraph 2.6 – 2.24 ought to be reconsidered. Paragraph 2.12 ought to be directly below the title AGEING MANAGEMENT	X			

10	2.9			X			
11	2.12		The meaning of "intended function" ought to be defined	X			
12	2.20	Change "AMPs" to "plant programmes" or vice versa	The distinction between "AMP" and "plant programme" ought to be defined. Are all AMP:s "plant programmes"? - Probably Are all "plant programmes" AMPs? - Probably Not		Plant programmes are explained in new para 2.14.		
13	2.32	Incomplete sentence	What assumptions are the LTO evaluation based on?	X			
14	3.11	Very detailed! In coming parts of the guide even more information is to be documented in SAR. E.g. 4.3, 4.4, 4.5, 4.15, 4.16	Some of the information is impracticable to have in SAR since the process to update is very time-consuming. The information that is required, in this guide, to be documented in			X	Purpose is to provide practical guidance on information which should be documented in SAR. This information is important for appropriate ageing management.

			SAR seems to be more comprising than what is required in GS-G-4.1				
15	3.33	Use "Suspended Operation" instead of "Long term shutdown"	Long Term Shutdown is a vague term that often causes confusion and should be used with caution or avoided completely. There is neither mentioned in the IAEA SF-1 and Safety Glossary and mentioned first in the SSR-2/1 5:13	X			
16	4.1	Delete line 4.	Line 4 is included in line 3.	X			
17	4.2	End the sentence after documented	Rules how to document this information ought to be regulated locally			X	The purpose of the para is to provide guidance on how to document this information.
18	4.3	End the sentence after documented	Rules how to document this information ought to be regulated locally			X	The purpose of the para is to provide guidance on how to document this information.

19	4.6	Thoroughly documenting the actual condition of each SSC important to safety documenting thoroughly the condition of each SSC important to safety (Safety Factor 2).	The writing is double	X			
20	4.18	Delete programme f), Corrective actions	Corrective actions are integrated part of other programmes such as maintenance and In-service inspection and ought not to be identified as a programme on its own			X	Please see para 4.50-4.54 where the content of Corrective action programme is described. It is true that it can be a part of other programmes in some NPPs.
21	4.37	A list or database should be developed ...	In some cases a list would be suffusion way of documenting	X			
22	5.13	Delete last sentence. "This scope setting is also typically used for LTO evaluation."	The sentence contradict the last part of 7.18 "accounting for differences in regulatory requirements, and codes and standards"		Sentence removed.		
23	Fig 2	Redesign the figure	The figure is composed similar to a DEMING cycle That can be	X			

			misleading.				
24	Fig 3	Delete "List of" in the bottom box on the left	It ought not to be required to make a separate list over SCs not included in the scope	X			
25	5.70 7.35	FSAR ought to be SAR		X			
26	Fig 4	Document that the TLAA has been re-evaluated and if the existing programmes are effective to manage ageing or need to be improved or modified and if a new programme should be established.	Delete "either" Also an AMR ought to be performed on SC with an TLAA. The TLAA does not always cover all ageing mechanism's	X			
27	5.16	Delete paragraph 5.16	The contents is identical to paragraph 5.17	X			
29	5.17	Change "item" to "SC"	"item" is not used in the rest of the document	X			
30	5.46, 5.47, 5.64	Delete "newly"	The requirement ought to be valid even if it is not <u>newly</u> developed	X			
31	Table 2	Change "aimed at slowing down potential degradation of SC" to "aimed to preclude	Activities aimed to slow down degradation of SC	X			

	attribute 2	potential degradation of SC from occurring"	is part of Attribute 5				
32	7.11, 7.16	Unclear if re-evaluation of TLAA according to 7.16 is required if TLAA have been completed for LTO according to 7.11			It is saying basically the same. 7.11. is in part "basic principles' and 7.16. in "development of programme for LTO".		
33	7.21-7.24	Unclear what to do if AMR are performed and documented in the frame of the ageing management programme.			If AMR is performed earlier (which is recommended), 7.21-7.24 provides additional considerations for LTO. Otherwise AMR should be performed for LTO.		
34	Figure 8	Delete box "Review of plant programmes for LTO	The activity is included in box "Ageing management review for			X	This is important difference between AM and LTO preparations.

			LTO”				For LTO also other plant programmes, which are credited for management of ageing, should be evaluated – see para 4.18, 7.25-7.26 etc.

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSSC Date: November 18, 2015				RESOLUTION			
Comment No. / Reviewer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	We suggest that the document add sections to address uncertainties (e.g.; quantified and unquantified) in assessment of performance of SSCs to support decision making for LTO or deferred decommissioning. Other factors such as funding, cost/benefit	The document needs to provide additional discussion and elaboration regarding uncertainties in the decision-making.			X	IAEA Safety Standards must focus only on safety aspects. It is stated in para 1.13 that “economic assessment and

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSSC Date: November 18, 2015				RESOLUTION			
Comment No. / Reviewer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		analysis, and stakeholders' inputs, may also influence decisions for accepting risks from LTO or deferred decommissioning. In addition, with extension of the life-time of operation and adoption of long-term deferred decommissioning, there may be increased probability of natural events occurrences such as earthquake or severe flood events.					long term investment strategies are outside of the scope". Other types of IAEA documents are covering these aspects. Currently update of TOCDOC 1309 is in development with title "Economic Assessment of LTO of NPPs: Approaches and Experience".
2	General / editor	Consider changing title to "Aging and Obsolescence Management Programs	The title could more adequately represent			X	In IAEA understanding ageing is wider than

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSCC Date: November 18, 2015				RESOLUTION			
Comment No. / Reviewer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	al	for NPP LTO.”	the content				obsolescence (see section 2). Ageing is physical and non-physical (obsolescence) and thus obsolescence is also covered by the title.
3	General / editorial	The document has 8 figures and 2 tables that are not defined in TOC. The TOC and document would be clearer if there could be numerical subheadings. The existing subheadings could benefit from greater focus. For example, pg. 11, “Programme for LTO” should be “Aging Management Programme for LTO.”	The document would be easier to read.			X	Pg. 11 provides definition of “Programme for LTO” which is later used in the document.

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSCC Date: November 18, 2015				RESOLUTION			
Comment No. / Reviewer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
4	General / editorial	There should be an acronym list, For example, EQ is used on p. 14 without first being defined.	The document would be easier to read. Not all acronyms are defined on 1 st use (EQ, SSR, SR, FSAR)		IAEA Safety Standards does not contain list of acronyms but all acronyms will be explained at first occurrence.		
5	General / editorial	Global comment on formatting – there are sections where there are large gaps (Fig 2 can fit on pg. 22, Fig 5 is incorrectly spread on pg. 30, 31). Both tables have font too small and plenty of available space.	Consistency in layout		Corrected but fonts will be further adjusted by editor.		

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSCC Date: November 18, 2015				RESOLUTION			
Comment No. / Reviewer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
6	General / editorial	There are run-on words such as “ofa” (1.10) or “ofSAR” (4.16) to be corrected.	The document would be easier to read.	X			
7	1.2, line 1	1.2. Ageing management for nuclear power plants means that ensuring is implemented to ensure that the ageing effects will not prevent affected systems, structures and components (SSCs) from being able to accomplish required safety functions throughout the service life of the plant (including decommissioning), with account taken of changes that occur with time and use [1].	Clarity	X			
8	3.3, line 4	Ensuring that all levels of the analysis are either performed, or specified and	Clarity	X			

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSSC Date: November 18, 2015				RESOLUTION			
Comment No. / Reviewer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	(first bullet)	accepted, by adequately qualified experts within operating organisation, to ensure ageing management (AM) and LTO specific aspects are taken into account;					
9	3.32 LTO & Deferring Decommissioning Issues	Extension of long-term operation period, as well as deferred decommissioning may take several decades (e.g.; more than 50 years) after facility scheduled permanent shut down. In this regard, we suggest providing more discussion and elaboration addressing the following key issues: 1. SSCs performance under long-term ageing, in order to ensure the integrity and function of SSCs (as elaborated in 3.37-38).	Completeness		As explained in comment 1, economic issues cannot be discussed in IAEA Safety Standard. We believe that this general approach to ageing management covers also		

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSCC Date: November 18, 2015				RESOLUTION			
Comment No. / Reviewer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		2. Funding issues to ensure funds are pre-allotted to cover replacement of components or structures and ensure adequate monitoring and inspection for safety. 3. The issue of maintaining records and corporate knowledge during the ageing period and ensuring continuity in management.			decommissioning phase. Intention is to develop AMPs for decommissioning phase as a part of IGALL Safety Report which is supplementing document for this Safety Guide.		
10	4.6, line 6-7	Thoroughly documenting the actual condition of each SSC important to safety documenting thoroughly the condition of each SSC important to	Eliminate duplicate wording.	X			

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSSC Date: November 18, 2015				RESOLUTION			
Comment No. / Reviewer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		safety (Safety Factor 2).					
11	4.7, line 2	objectives of the PSR [8] and or achieve the equivalent outcomes as those of the PSR should be performed	The purpose of this provision is to achieve certain outcomes from a safety assessment and the use of "or" allows approaches that are different from PSR but achieve similar outcomes.		The whole sentence removed (requested also but other MS).		
12	4.10, line 2	[no proposed new text – meaning of "permanently recorded into accessible form" is not obvious]	Need to clarify wording.	X			
13	4.10, 4.15; 4.16	Of the SAR; in the SAR	Clarity	X			

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSCC Date: November 18, 2015				RESOLUTION			
Comment No. / Reviewer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
14	4.1, 4.18, 4.19, 4.48	"...ageing management and for LTO;" or use ageing management and LTO evaluations.	Clarification and consistency in wording	X			
15	4.31, line 1-2	The review of equipment qualification should include an assessment of the effectiveness Requirement 13 of [2] of the plant's equipment qualification programme in accordance with Requirement 13 of [2] .	Clarity	X			
16	5.11, line 3	development and maintenance	Editorial	X			
17	5.26, line 6	AMR reporting to demonstrate that the ageing effects/ degradation mechanisms are being managed	Clarity	X			

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSSC Date: November 18, 2015				RESOLUTION			
Com ment No. / Revie wer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejecte d	Reason for modification/rejectio n
18	5.41, line 6	members of the population that will be inspected, given that the PSA is a living PSA	Need to define "living PSA," provide an IAEA reference, or eliminate wording after "inspected."	X			
19	5.42, 5.50	Information and example summaries of SC specific or degradation mechanism specific AMPs provided in [5] can be used as a guidance	5.50 is superfluous, much the same meaning as 5.42. Also the 1 st sentence had plural subject and singular predicate.	X			
20	5.43, line 2	The meaning of this is not clear: "Existing plant programmes should be coordinated to cover the activities shown in 5.39."	Need to clarify wording.	X			
21	5.70,	5.70 The documentation should include	Change "FSAR" to	X			

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSCC Date: November 18, 2015				RESOLUTION			
Comment No. / Reviewer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	line 1	a FSAR SAR update reflecting the assumptions, activities and results of the plant programme for ageing management.	"SAR". Consistency with the rest of the guide, since SAR is apparently used as a surrogate for FSAR and UFSAR.				
22	6.10	Meaning of " the industry collaboration " is not clear – "The operating organization should exchange information and participate in the industry collaboration to utilize industry tools to identify and resolve common technological obsolescence."	Need to provide more detail on "the industry collaboration," or eliminate "the."	X			
23	7.4	In addition to the existing obligations assessiated-associated with ageing management, the operating	Correction	X			

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSSC Date: November 18, 2015				RESOLUTION			
Comment No. / Reviewer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		organization					
24	7.9	LTO concept program should address basic goals and objectives, milestones, activities, organizational roles and responsibilities, interactions with other major projects, interaction with external organizations	Clarification and consistency in wording		LTO concept is a meaning of strategy. It is corrected.		
25	7.19, 7.20	Eliminate these paragraphs (7.19 and 7.20).	These are redundant with 7.17(b) and 7.17(c).		7.20 removed but 7.19 provides important link to section 5 where we describe scope setting.		
26	7.35	7.35 The documentation should include an update of the FSAR SAR reflecting the assumptions, activities and results	Change "FSAR" to "SAR". Consistency with the rest of the	X			

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSSC Date: November 18, 2015				RESOLUTION			
Comment No. / Reviewer	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		of the plant programme for LTO. The FSAR SAR update should also include documentation of the revalidation of the TLAAAs for the LTO period.	guide, since SAR is apparently used as a surrogate for FSAR and UFSAR.				

DS485 - Ageing Management and Development of a Programme for Long Term Operation of Nuclear Power Plants

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Country/Organization: INDIA		Page.... of.... Date:					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	Sec. 4.16	All changes to design basis should be included in SAR and or separate design basis documentation.	To maintain consistency with Sec. 4.15	X			

Note: The bold text with red font in yellow background is the proposed new text.

DPP Draft Safety Guide DS485 "Ageing Management and Development of a Programme for Long Term Operation for Nuclear Power Plants"
(Dated 07 July 2015)

Status: STEP 8 – For Review and comments of the DPP by Member States

Note: Blue parts are those to be added in the text. Red parts are those to be deleted in the text.

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Ageing Management Directorate		Country/Organization: Pakistan Atomic Energy Commission, Pakistan. Date: 2015-10-15					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Chapter 1 1.11	This Safety Guide deals with the establishment, implementation and improvement of ageing management and ageing related activities important for safe LTO of nuclear power plants (including decommissioning), taking into account of the differing different reactor designs worldwide.	Redraft	X			
2	Chapter 3 3.2	Regulatory requirements for ageing management should be established and guidance should be developed to ensure that the operating organization of a nuclear power plant implements an effective ageing management at each stage of the plant life.	Essential technical input	X			
3	Chapter 4 4.7	If national requirements do not require PSR, an alternative routine comprehensive safety assessment that meets the objectives of the PSR [8] and achieves the equivalent outcomes as those of the PSR should be performed.	Restructuring of text in order to avoid unnecessary repetition of information	X			
4	Chapter 4 4.13	The design basis information should be accessible to the concerned plant personnel.	clarification	X			
5	Chapter 4 4.29	The qualified life of equipment should be reassessed during its life cycle, with taking into account taken of the progress in knowledge of degradation mechanisms and the actual operating environment of the	Restructuring of text	X			

		equipment. If the qualified life is to be increased, a thorough safety demonstration should be provided by the operating organization.					
6	Chapter 5 5.26	The AMR should be performed for each in-scope SC or commodity group of SCs, and should consist of the following essential elements: - Identification of ageing effects/ degradation mechanisms based on knowledge base for understanding ageing (design basis, materials, environments, stressors etc. - see Figure 1); - Identification of appropriate programme for ageing management; - AMR reporting to demonstrate that the ageing effects/ degradation mechanisms <u>are</u> being managed effectively.	Grammar and elaboration	X			
7	Chapter 5 5.45	The re-development of the AMPs should be based on the results of the AMR.	Elaboration				we talk here about original development.
8	Chapter 7 7.10	The plant staff should be familiar with LTO and should understand LTO its principles and concept.	Restructuring of text in order to avoid unnecessary repetition of information.	X			
9	Chapter 7 7.11	AMR and TIAA evaluation should have been completed previously in accordance with Section 5: and if not this has not been previously completed , then it should be completed for LTO.	Restructuring of text in order to avoid unnecessary repetition of information.	X			
10	Chapter 7 7.12	Technological obsolescence should have been addressed previously in accordance with Section 6: and if not this has not been previously completed , then it should be completed for LTO.	Restructuring of text in order to avoid unnecessary repetition of information.	X			
11	Chapter 7 7.13	The LTO assessment should demonstrate that the ageing effects will be adequately managed so that the intended functions of SSCs can be maintained consistent with the plant's CLB for the planned period of LTO.	Essential technical input	X			

Ageing Management and development of a Programme for Long Term Operation of Nuclear Power Plants (DS-485)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: CNS				Page 1 of 1			
Country/Organization: PNRA, Pakistan				Date: 06/11/15			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	5.25	<p>New bullet may be added in section 5.25</p> <p>6. In case where the qualified lifetime of the safety equipment cannot be extended by accepted TLAA techniques, such equipment shall be requalified or replaced at the expiry of their present qualification.</p>	For the validity of the equipment qualification for safe operation.	X			
2.	5.65	<p>May be added in last of para 5.65.</p> <p>For long term operation assessment of major components, pressurized thermal shocks analysis (PTS) should be revalidated, to evaluate the effects of aging.</p>	As IAEA-EBP-SALTO provide comprehensive guidance for PTS.				<p>PTS is only one example of TLAA's. Please see para 5.64 where the reference to IGAU is placed</p>

Forms for Comments

Ageing Management and development of a Programme for Long Term Operation of Nuclear Power Plant (DS485)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Country/Organization: China / CAEA Date: Nov. 11, 2015							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification /rejection
1	Page 3 CONTENTS Section 5	The two subtitles in Section 5- <u>"AGEING MANAGEMENT REVIEW"</u> and <u>"DOCUMENTATION OF AGEING MANAGEMENT"</u> should be added in the CONTENTS.	These two subtitles are missing.	X			
2	General	Suggesting to add the overall process flow chart to fully elaborate the relationship of organizational arrangements, data collection and record keeping, scope setting, AMR, AMP and TLAA, and illustrating the differences between AM and LTO work process flow on the basis of the second recommendations, especially for AMR work.	Make sure the structure and the technical content of the report is clear.		Please see Fig. 8.		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Country/Organization: China / CAEA Date: Nov. 11, 2015							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification /rejection
8	Page 25 Para 5.15 Line 17	Add " <u>fire protection</u> " before "pressurized thermal..."	Fire protection is a specific regulation in NPP.	X			
9	Page 27 Para 5.25 Item 1 Line 2	"Results of the TLAA evaluation should be taken into account in AMR" should be revised.	As mentioned in FIG.4, some of the TLAA's don't need take into account in AMR.				Results of TLAA's goes to AMR and to results of the process in parallel.
10	Page 27 Para 5.26 Line 6	Revising to be "AMR reporting to demonstrate that the ageing effects/ degradation mechanisms being managed <u>during LTO operation.</u> "	"During LTO operation" should be added to emphasize the period.				This section applicable for all phases of NPP life.
11	Page 27 Line 9	"Process to identify programmes to manage ageing of in-scope SCs" should be revised to " <u>Process for ageing management review of in-scope SCs</u> ".	Making the description more accurate.	X			AMR is only part of the process as shown in FIG 4.
12	Page 39 Fig. 8	"Review of plant programmes for LTO" in FIG.8 should be deleted.	Review of plant programs is a part of AMR.				AMR does not include review of all plant programmes.

TITLE: DS 485

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: UNESA Country/Organization: SPAIN Date: Oct. 30, 2015							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Para 2.12	Use CLB instead design basis		X			
2	Para 3.9	Add a new line to consider mitigation activities, for example, chemistry programs.		X			
3	Fig 4	Complete the box "Results of TLAA evaluation" or introduce a reference to 5.63 to 5.67	The box "Results of TLAA evaluation" is not clear enough. What are the criteria to go right or left?	X			
4	Para 5.39	In the four points after "... types of activities:", change "programmes" for "activities"	In the first line of 5.39 the name used is "activities"; in addition a program may contain different types of activities.	X			
5	Para 5.40/ first line	Change AMP for activity	Same as comment 4	X			
6	Para 5.70, 7.35	Change FSAR for SAR	In the document SAR and FSAR are used for the same thing.	X			

DS485, Ageing Management and development of a Programme for Long Term Operation of Nuclear Power Plants, Draft, 07 July 2015

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: M-L Järvinen, P. Vuorio		Page.... of....					
Country/Organization: Finland STUK		Date: 17 th November 2015					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	General	<p>Aging management and long term operation are important topic for safety of nuclear power plants. The idea of drawing up the overall view of aging management its relation to other processes is good.</p> <p>The TOC of the document seem to contain a lot of high level concepts related to ageing managements. There seems to be overlap and repetition in the content of the sections. The concept of conceptual obsolescence is new and not commonly known.</p> <p>It is proposed that the plan is updated and the content of the safety guide to be developed would be reconsidered so that there is balance in between the conceptual and strategic aspects and the program, actual means to carry out the program such as "Condition monitoring" and "Maintenance" and the interface with other processes such as licensing, PSR or LTO.</p>					<p>Discussed with STUK and it was agreed that the comments will be considered in the next revision of the guide</p>

2.	4.2	<p>Each plant programme and analysis should be properly documented in safety analyses reports or in other CLB documents and should clearly and adequately describe the CLB or the current design basis requirements for nuclear power plant operation. Individual ageing of SSCs should be taken into account.</p>	<p>Add. Individual ageing of SSCs should be taken into account.</p> <p>Individual ageing of SSCs should be taken into account. In a system with redundant subsystems, the conditions of SCs in a subsystem should be monitored separately and independently from others</p> <p>Layout, fabrication, operation history, process and environmental conditions may vary between redundant subsystems. Thereby inspections of SCs of one subsystem must not credit others.</p>	X	<p>It was agreed to modify 4.36 instead</p>		
3.	5.6	<p>Responsibilities for the implementation of AMPs and for reporting on SSC performance should be defined and allocated within the plant organization (e.g. operations, maintenance and engineering). This should include also knowledge management and continuity planning in case of change of the personnel.</p>	<p>Add: This should include also knowledge management and continuity planning in case of change of the personnel.</p> <p>"Human" ageing shall also be considered in the guide.</p>	X	<p>It was agreed to modify 1.15 instead</p>		

			In case of personnel changes documented procedures should be established in order to ensure that any information and knowledge necessary for the AM will remain in the organization.				
4.	7. Programme for long term operation	Majority of the text should be removed. In LTO period the same ageing management procedures are valid and hence extensive repetition is not necessary.	Since the same or similar information is repeated in chapter 7 as in the previous chapters, it is difficult to identify those issues most relevant to LTO.				Discussed and agreed as per comment 1.

DS485 Ageing Management and Programme for Long Term Operation for Nuclear Power Plants

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Kamran Sepanloo Country/Organization: IRAN / NNSD			Page 1 - 2 Date: 15.10.2015				
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Page 7	Siting stage is recommended to be added to the ageing management scope	Site parameters can affect (accelerate or decelerate) the ageing of the plant.			X	It is not clear where and how should be siting stage added.
2	Page 13	Design: DBA and BDBA should be updated and adequately addressed.	NPP operational conditions and lessons learned from accidents might introduce changes to the DBA and BDBA list.			X	It is not clear what changes should be done
3	Page 18	PLANT PROGRAMS: In order to have an effective ageing management program the operating organization should have a QAP.	QAP of ageing management gives the operator and the regulator a kind of assurance about effective execution of AMP.	X			
4	Page 41	Scope setting of SSC for LTO: Containment structure should be included in LTO scope setting	According to the lessons learned from the Chernobyl and Fukushima accidents, containment has high importance in mitigation of the consequence of the accidents.		It is covered by para 5.15 iii		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Kamran Sepanloo		Page 1 - 2					
Country/Organization: IRAN / NNSD		Date: 15.10.2015					
5	Page 21	Knowledge management	Due to LTO a new generation of staff should be trained to become knowledgeable about the new conditions and procedures of the plant. The knowledge management program could be prepared based on the results of a systematic assessment of competency needs and expertise.				Please see para 1.13 - obsolescence of knowledge management is excluded from the scope of Safety Guide

To: NUSSC Committee
Ageing management and development of a Programme for Long Term Operation of Nuclear Power Plants
 NSC/02

SEP-22-2015 04:29PM

FROM: ENEA

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F-163

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Mr. Moustafa Aziz Page.... of.... Country/Organization: Nuclear and radiological Regulatory Authority , Egypt Date:							
Comment No.	Para/Line No	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Para 1.10 page 6 second line	... development of a programme	Space should be left between of and a program	X			
2	Para 2.12 page 8 , (third item	Operation , irradiation and maintenance history (including commissioning , repair , modification and)	The word irradiation is inserted because irradiation history is important for aging management	X			
3	Para 3.14, page 14	EQ should be defined and inserted in the text	EQ is not defined	X			
4	Para 5.4 , page 22	- Review of equipment (technological obsolescence	Add this text to the responsibilities of the ageing management entity				Section 6 is devoted to technological obsolescence Please see para 6.1-6.11
5	Figure 5 page 31	- Figure 5 Should be in one page		X			

Form for Comments
Ageing Management and Development of a Programme for Long Term Operation of Nuclear Power Plants
(DS485)

COMMENT BY REVIEWER				RESOLUTION			
Reviewer: Rostechnadzor (Scientific and Engineering Center for Nuclear and Radiation Safety)		Page... 1 of 2					
Country/Organization: Russian Federation		Date: 16 November 2015					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	3.4.	Replace «Operating organization» with «Design organization in cooperation with operating organization» with no further amendments to the text	The para is not applicable for the Russian Federation, because at structures and components design stage Operating Organization has limited influence in the Russian Federation. At structures and components design stage it is more appropriate to engage design organization to develop forward-looking strategies for ageing management.		Responsibility is with operating org. but design org. should be also mentioned "Oper. org. in cooperation with design org..."		

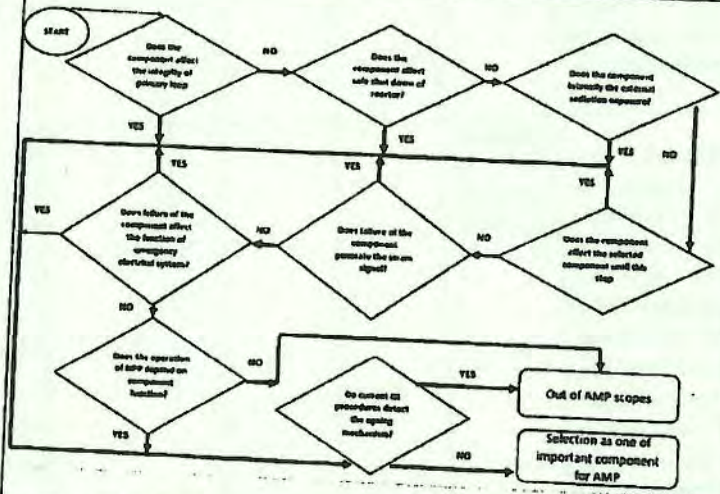
2	3.13	After «and fabrication data» add «transportation, storage conditions of manufactured equipment»	It is necessary to consider negative impacts which may occur during transportation and storage of manufactured equipment.		Added in para 3.14.		
3	3.24	After «Operating organization» add «in cooperation with design organizations» with no further amendments to the text	Modification of Structures and Components, which is covered by para 3.24, is not within Operational organization's competence. In the Russian Federation such actions can be performed only in cooperation with design organization and after approval by the Regulatory body.	X			

Form for Comments

Ageing Management and Development of a Program for Long Term Operation of Nuclear Power Plants (DS485)

COMMENT BY REVIEWER				RESOLUTION			
Reviewer: NPPD-TAVANA Co. Country/Organization: Iran/ NPPD-TAVANA Co.							
Comment No.	Para/Line No.	Comment	Reason	Accepted	Accepted but modified as follows	Rejected	Reason for modification/rejection
1	<u>Section 5.10 (Data collection and record keeping)</u>	One of main steps in Ageing Management Program (AMP), indicated in this document, is data collection and data bank generation for AMP purpose. In addition to this data bank, there are the other data collection and store procedure for a wide range of projects such as PSA, Configuration management, chemical control, maintenance, and ISI data center. AMP uses some of these data for prediction and TLAs. So an idea would be offered for AMP data bank as a platform employing the requisite data from the other data center. It seems that development of the other data bank has no advantage for NPP and would be considered as repeated procedure. For example, In Bushehr NPP material lab, chemical lab, maintenance and repairing group and I&C department generate a local data bank for internal purpose. It is suggested to add a flowchart or top-down structure in section 5 (Data collection and record keeping) implementing this concept for data collection of AMP.	Integration of existing databanks in NPPs saving time and cost		Mentioned inputs added to the list		
2	<u>Section 5.9 (Data collection and record keeping)</u>	Some TLAs are based on the data obtaining from different source such as ISI and maintenance as pointing out in this safety guide. For a new NPP e.g. Bushehr NPP, which have no major changes in many case, no defect and specific data deviation reveals in the primary data. This condition leads to inefficiency of some correlations and analysis tools. Using generic data is one of the substitution procedures in LPSA. It seems that this method would be used in AMP. If employment of generic data is acceptable in the first year of NPP	Limitation of NPPs in first years of operation such as Bushehr	X			

		operation, the procedure and data collection strategies should be established in this safety guide. Otherwise, the authors would be better to add more sophisticated procedures and correlations to bridge the gap.	NPP				
3	<u>Section 5.21(Scope setting of systems, structures and components)</u>	In page 26, the procedure of system and component selection of LTO and AMP is depicted with consideration of safety aspects. As obtained from safety guilds and technical reports, one of the main issue for LTO is economic interest. So it is necessary for AMP to categorize the effective parameter of this interest. Whereas replacement of many components and systems is impossible for a wide range of systems and components, it is implied that all of them is in the scope of AMP. The unique design and construction of the main systems and components intensify the interests for such NPP. For example, there are many components in Bushehr NPP which have direct influence on the continuation of operation e.g. turbine, generator, deaerator. By consideration of these requirements, we should survey these components in AMP by detail. It seems the flowchart should be updated by the other strategy. Also safety interests need more explanation to obtain a favorable list of components. Our examination shows that the proposed procedure lead to ambiguities of components selection. Our suggestion is more practical method and a sample list of components in both category (safety and economic). For Bushehr NPP, we proposed the following algorithm.	Suggestion of practical procedure				Economic aspects are excluded from this Safety Guide - please see para 1.4.3. The rest of FIG 2 must remain general to be applicable for all designs



4	<u>Section 5.2 (Organizational arrangement)</u>	For organizational AMP arrangement (p.23) the ageing management entity has separate responsibility from NPP license holder and operational organization. AMP could be categorized as one of the technical support organization efforts and its steps and requirements have been considered as relation between NPP license holder, operational organization and technical support organization.	Connection between AMP and TSO activities					
5	<u>Section 5.1 (Data collection and record keeping)</u>	After the operation of a NPP, the requisite data for AMP will be more important and useful. It seems that the importance degree of primary data is less than next data. But no difference is considered for AMP in NS-G-2.12. The first data having no efficiency in AMP, can be ignored and by definition a criteria the other series of data can be included in AMP.	Consideration of NPPs in first years operation	X				
6	<u>Section 7.5 (Program for LTO)</u>	Calculations of the probability of failure, leaks and defects of components and systems of NPP, would be used for optimization of non-destructive inspection and technical maintenance and new strategy for Plant Life Management (PLiM). The results of calculations	Application of the program for					

AMP should be a task of operators with possible support of external organization.

PSA results are used - see 5.47

