Draft Safety Standard

***DS 485 Ageing Management and Programme for Long Term Operation for Nuclear Power Plant* – 4 June 2015**

ENISS Comments

COMMENTS BY REVIEWER Reviewer: ENISS RSG Country/Organization: ENISS			Page: 1 of 5 Date: 5 June 2015	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1.2 pg 5	New 1.2 text : "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 accomplish required safety functions throughout the service life of the plant (including decommissioning), with…."	We think this is important to recognise early that effective ageing management also includes those SSCs to support safe decommissioning, as per detail later in 3.37	X			
2	1.11 pg 6	New 1.11 text : 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 account of the differing reactor designs worldwide.	This text serves two purposes : Firstly, as per above, we think it is important to confirm in the scope that decommissioning is explicitly covered, as per detail later in 3.37. Secondly, we think the scope should make it clear that the intent is to cover all types of reactor design. As it is currently written there is an apparent bias towards PWR / BWR configurations, with focus on water chemistry as opposed to other coolant / moderator combinations (also see later comment on need for differing coolant chemistry considerations).	X			
3	2.20	Change "AMPs" to "plant programmes" or vice versa	There should be consistency in terminology, or the distinction between "AMP" and "plant programme" should be defined.	X (It is explained in Para 2.9, 2.10, 2.18 and			

				2.19.)			
	2.23	A proposal cannot be made because of unclear information. Please, re-phrase to avoid misunderstanding.	It is unclear what is the 2nd parameter. Making guesses ought to be avoided.	X			
4	2.29 pg 11	Add new section "7 Management of Knowledge Obsolescence". This should summarise the key guidance from identified references in 2.29.	ENISS notes the exclusion of obsolescence of knowledge, and the reference out to Refs 2 and 8. However, we think that this Safety Guide would benefit from inclusion of how operating organisations should protect themselves against obsolescence of knowledge **both** internally within the organisation **and** externally amongst the Suppliers. Such a new section would make DS485 much more complete and useful to the reader.			X	The scope of SG was approved by CSS and knowledge management is out of scope of this SG. It will be covered by IAEA SG on Knowledge Management (in preparation).
5	Table 1	Table 1 should be placed after 2.29 for better coherence in the text flow.	Better readability.	X			
6	3.3 pg 12	- Ensuring that all levels of the analysis are either performed, or specified and accepted, by adequately qualified experts within the operating organisation, to ensure AM and LTO specific aspects are taken into account."	The suggested additional text provides the necessary flexibility which may be required when suppliers undertake analysis on behalf of the operating organisation, still identifying the need for qualified experts within the operating organisation to specify and accept such work.	X			
7	3.11	Ageing management should be addressed in the safety analysis report in accordance with GS-G-4.1 ~~included as a topic in the general design criteria and should be addressed in the safety analysis report. Ageing management should include the following topics~~ [10]~~:~~ Delete the bullets under paragraph 3.11. Keep the reference to GS-G-4.1.	Limit the amount of information that should be addressed in the SAR. It is impracticable to have too much information on ageing management reported in SAR. Information on ageing management is better reported in other documentation. It is suggested a general reference to GS-G-4.1 is made rather than to specify explicitly what is to be reported in SAR within this document. Furthermore, the notion of		"General design criteria" removed from the text (it is covered by Para 3.10). GS-G-4.1 contains only very general recommendations on AM part. It is important to specify what should be described in SAR.		

			"…included as a topic in the general design criteria" ought to be clarified. The risk for mix-up with US NRC GDC (General Design Criteria) is obvious. GDC specify NRC's requirements for the design of nuclear power reactors. Ageing management is not suitable as a principal design criteria. General design criteria (Appendix A to 10 CFR Part 50) establish the "necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety".				
8	3.25	"hot spots" ought to be mentioned	The presence of "hot spots" may have a significant impact on ageing management.	X			
9	3.32 pg 16	New 3.32 bullet : - Review radiological dose trends to assess impact on surveillance activities which may be required to support LTO.	Adding a new bullet within 3.32 prompts the operating organisation to think about the impact of increasing dose levels in the context of surveillance. If there are dose constraints then such an early review will identify these activities, allowing the operator to schedule earlier surveillance. In this way dose levels do not become prohibitive.			X	Proposed bullet has a different level of detail comparing to current bullets in the list.
10	Section 4	Rename "Water Chemistry" section to "Coolant Chemistry" and change individual references from "water" to "coolant" within the existing bullets 4.45 to 4.48.	Section 4 text is too biased towards water cooled scenarios (PWR/BWR). This Guide will be relevant to Operating Organisations with other reactor design types (eg. Gas-Cooled Reactors), and therefore the renaming of the section, along with removal of specific consideration to water will provide wider coverage of scope.			X	Water chemistry cannot be replaced by coolant chemistry. Gas cooled reactors will have most probably different requirements on coolant.
11	4.3	(SSAR) ought to be (SAR)	Editorial correction.	X			
12	Note 3 page	FSAR replaced by SAR ?	Is the right terminology being used ?	X			

	15, 5.63 item 6, 5.70, 7.33						
13	4.10	All modifications of SSCs, releases of process software, operational limits and conditions, set points, instructions and procedures should be permanently recorded into accessible form. All non-minor or safety-significant modifications should be part of SAR.	The existing structure of SARs does not necessarily make it useful to record *all* modifications there, especially minor modifications. Instead, the guide should allow a database-based handling of such changes.	X			
14	4.24-4.32	Introduce better clarity to define the relationship between "Equipment Qualification" and "Environmental Qualification". This could be done as part of 4.25 **OR** Change the heading "Equipment Qualification" to "Environmental Qualification".	The heading is "Equipment qualification" but 4.25-4.32 is about Environmental qualification. Therefore, EITHER need to confirm relationship between "Equipment Qualification" and "Environmental Qualification" OR change title of section heading to reflect main focus of what follows.	X			
15	5.3	The text in para. 4.4 in existing NS-G-2.12 is open to achieve the coordination function not only through an entity but also through a task force	It ought to be acceptable to solve the coordination function through a task force	X			
16	Fig 3	Change the text in the Decision Box to "Is the SC at the same time short-lived, subject to periodic replacement or scheduled refurbishment plan, and not required by national regulatory requirements to be included in the scope ?"	The text should be consistent with the text in 5.16	X			
17	Fig 8	The Figure is not entirely consistent with text. The Figure presents the LTO Assessment boxes (Review of plant programmes for LTO, Ageing BManagement Review for LTO, Revalidation of TLAA) in parallel, whereas they probably should be in series, to better reflect the text in	This makes the Figure consistent with intent of the text 7.19 to 7.25.		Situation is explained in new Paras 7.19 and 7.20.		

		7.19 to 7.25.					
18	5.16	A footnote should be added to define "Short-lived"	Better clarity is required in terms of what "short-lived" means, to avoid confusion and inconsistency across the industry.		Short-lived removed from the text as it is covered by other conditions.		
19	Figure 4; page 27	Remove the direct link at the Top of the Figure which can bypass the question in relation to the existence of TLAA. The Scope should be connected to the AMR box through the TLAA question box.	The Figure allows a direct bypass of the TLAA question.	X			
20	5.27	Is the reference to 5.27 correct? Should be changed to 5.28	Referenced paragraph is wrong.	X			
21	5.43	The reference to 5.37 should be 5.39	Referenced paragraph is wrong.	X			
22	Table 2	Change "aimed at slowing down potential degradation of SC" to "aimed to preclude potential degradation of SC from occurring"	Activities aimed to slow down degradation of SC is part of Attribute 5			X	In Attribute 2 we are describing "preventive actions" which include "determination of service conditions" to "minimize and control ageing effects". Minimize means "slowing down" (proactive approach). In majority of cases we cannot preclude degradation. In Attribute 5 we describe actions to mitigate detected ageing effects (reactive approach). In this sense, the IAEA has developed more than 70 AMPs in a scope of IGALL programme (please see also SRS No. 82 on IGALL) and can hardly

							be changed now.
23	5.66	Change 5.66 title to "Validity of TLAA over intended period of operation. The validity should be assessed through demonstrating satisfaction against one of the following criteria : …."	The suggested new text will provide better clarity of the differing intents behind 5.63 and 5.66. As it is currently written there appear to be two sets of criteria for TLAAs, with no identified differences.	X			
24	7.1, 7.5	Delete the reference to [21] Safety Reports Series No. 57.	The guidance for LTO should be included in this Safety Guide. Confusing to have two document dealing with the same issue. E.g. the 9 attribute in table 2 are not identical to the 9 elements in report 57 para 5.3			X	The basic approach is to have main recommendations in Safety Guide and more details as recommended solutions in Safety Reports (57 and 82). In case of discrepancy, Safety Guide is of course valid and Agency will update SRS 57 while a new Safety Guide is published.
25	7.16, 7.25	Reference 5.67 ought to be 5.66	Referenced paragraph is wrong.	X			

Finland

COMMENTS BY REVIEWER Reviewer: M-L Järvinen, P.Vuorio, K. Mäkelä Page.... of.... Country/Organization: Finland STUK Date: 4th June 2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	General	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.			Draft follows approved DPP. Concrete comments are welcomed to improve content		

		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 obsolesce is new and not commonly known. 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.			of the document.		
2.	3.9 In the design phase, the following should be ensured:	Smooth realization of inspections and maintenance is possible for SSCs over a service life.	For long term AM, inspectability and maintainability are very essential design features of SSCs	X			
3.	4. Relevant plant documentation and programmes	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.	Layout, fabrication, operation history, process and environmental conditions may vary between redundant subsystems. Thereby inspections of SCs of one			X	It is not clear where should be this sentence placed.

			subsystem must not credit others.				
4.	5. Management of ageing	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.	"Human" ageing shall also be considered in the guide.			X	As stated in para 1.12, this SG focuses on physical ageing of SSCs and technological obsolescence. It was not approved in DPP to take care about human ageing.
5.	7. Programme for long term opertaion	Majority of the text should be 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.			X	Section 7 contains only activities which are specific for LTO. Objective is to address Requirement 16 of SSR 2/2 on Programme for Long Term Operation. Activities which are already described in previous sections are referred here and not repeated.

France

COMMENTS BY REVIEWER Country/Organization: FRANCE/ASN Date: 22 May 2015 Pages				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection

COMMENTS BY REVIEWER Country/Organization: FRANCE/ASN Date: 22 May 2015 Pages				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	General	Concerning LTO, by reading the draft, it could be understood as regulatory concern related to LTO is only on adequate management of ageing. For France, LTO assessment is part of a PSR process. Therefore, going to LTO is also a key moment for implementing modifications which will bring the reactor closer to GEN III standard, i.e. by further limiting off-site consequences of accidents. This is not reflected in the draft. Suggestion to either change significantly the content of the draft or change its title to "Ageing Management, <u>including when developing a</u> ~~and~~ Programme for Long Term Operation for Nuclear Power Plants"	Preparing and deciding on LTO is not only addressing ageing. Furthermore, ageing management starts from the very beginning, whether or not 30 years later, LTO will be prepared… Changing SG title would also make it more consistent with its scope as defined in 1.11 and 1.13.		Title modified to satisfy comment and stay consistent with two basic Requirements of SSR 2/2 which should be addressed by this Safety Guide: Requirement 14: Ageing Management and Requirement 16: Programme for Long Term Operation		
2.	1.5	In addition, ~~an emphasis on maintaining~~ safety of nuclear power plants during long term operation (LTO) has become more important due to the steady…	Superfluous (see general comment)	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3.	1.10	The Safety Guide provides good international practices on establishing, implementing and improving ageing management, including when developing a programme for safe LTO for nuclear power plants.	Make it consistent with 1.11 and 1.13 (see general comment)		Modified to satisfy comment and stay consistent with two basic Requirements of SSR 2/2 which should be addressed by this Safety Guide: Requirement 14: Ageing Management and Requirement 16: Programme for Long Term Operation		
4.	1.12	The Safety Guide focuses on managing physical ageing of SSCs within the scope defined in Section 5 (in-scope SSCs). It also provides recommendations on safety aspects of managing technological obsolescence in Section 6 and some recommendations, focused on ageing management, on programme for safe LTO of nuclear power plants in Section 7.	Section 7 is essentially focused on ageing management. Other aspect related to LTO are barely addressed. Make it consistent with 1.13			X	It is clearly stated in 1.13 what is outside of the scope of this SG. Comparing to Requirement 16 of SSR 2/2 on Programme for LTO, only "safety upgrading and verification" is not covered.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
5.	1.14	This Safety Guide is intended to provide recommendations on ageing management ~~and ,~~ <u>including when developing a</u> programme for LTO for nuclear power plants.	See general comment and comment on 1.10		Modified to satisfy comment and stay consistent with two basic Requirements of SSR 2/2 which should be addressed by this Safety Guide: Requirement 14: Ageing Management and Requirement 16: Programme for Long Term Operation		
6.	1.15	Section 2 presents basic concepts of managing ageing and obsolescence <u>as well as their implications for</u> a programme for safe LTO, which provide a common basis	See general comment and comment on 1.10	X			

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7.	2.30	LTO of a nuclear power plant is operation beyond an established time frame defined by the licence term, the original plant design, relevant standards, or national regulations. LTO is to be justified by safety assessment and, depending on Member States, this may take place within a broader regulatory process such as licence renewal or a periodic safety review [8]. Among the various topics covered by the safety assessment, ~~with~~ specific consideration given to adequate management of the ageing processes that can affect the SSCs within the scope of the LTO review, and ensuring that these SSCs will retain functionality during the period of LTO.	Clarification. Consistency with 5.72 Also introduces regulatory process…	X			
8.	2.32	Delete 2.32	Redundant with modifications suggested to 2.30			X	It is not about the process as 2.30 but about the content.
9.	3.31	The operating organization should justify that the physical status of SCs will be managed consistent with the current licensing basis3 (CLB) systems, structures and components systems, structures and components for the LTO period. Concerning ageing management, The operating organization should review and validate the existing AMPs for all in-scope SCs that have an impact on the performance of systems important to safety…	Clarification	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
10.	3.32	Since LTO is operation beyond the originally established timeframe and LTO evaluations are based on assumptions, the operating organization should perform the following activities to validate or correct the ageing related assumptions so that plant safety during LTO is assured and further improved:	Clarification	X			
11.	3.33	Long term shut downs are plant shut downs lasting for a period exceeding generally more than one year, and exclude regular maintenance outages. During long term shut downs, SSCs may need to be placed in temporary lay-up or safe-storage states that require supplementary measures and controls to minimize or prevent ageing effects.	Not such a predefined criteria in France	X			
12.	4.1	The following nuclear power plant programmes and documentation relevant to ageing management and, where relevant, LTO (also referred as "preconditions for LTO") should be in place at the plant: - Safety analysis report or other CLB documents; - Configuration/modification management programme including design basis documentation; - Plant programmes relevant to ageing management - Plant programmes relevant to ~~and~~ LTO; - TLAAs according to Section 5.	Some plants will go for all LTO but all plants have to manage ageing, have a FSAR, configuration/modification management…	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
13.	4.6	The PSR is a comprehensive assessment of the plant safety [2]. The content and the scope of the PSR should be consistent with [8]. Among the 14 safety factors described in [8], some have a strong link with ~~When assessing~~ the ageing management ~~and long term operation,~~ For example, the operating organization should particularly consider:	PSR is not only performed when going to LTO. Clarification as factors 8 to 11 do also have a link with ageing management….	X			
14.	4.9 to 4.17	Delete 4.9 to 4.17	These are not specific to ageing management nor LTO.			X	Configuration/modification management programme is one of the most important programmes for NPPs in preparation for LTO because LTO is typically connected with many safety important modifications. Availability of design basis is also crutial and is frequently issue.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
15.	Title before 4.18	PLANT PROGRAMMES <u>ESSENTIAL TO AGEING MANAGEMENT</u>	Clarification to focus section on ageing management			X	This is a list of programmes important not only for AM but also for LTO and their appropriateness for LTO should be evaluated – please see also Req. 16 od SSR 2/2 and SRS 57, section 3.2 and 3.3.
16.	4.18	Existing plant programmes listed below should be considered as essential to ageing management ~~and LTO~~:…	To focus on ageing management. These programs should exist whether LTO is or not considered.			X	This is a list of programmes important not only for AM but also for LTO and their appropriateness for LTO should be evaluated – please see also Req. 16 od SSR 2/2 and SRS 57, section 3.2 and 3.3.

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17.	4.19	Existing programmes which are credited for ageing management ~~and LTO~~ should be consistent with the nine attributes described in Section 5.	To focus on ageing management. These programs should exist whether LTO is or not considered.			X	This is a list of programmes important not only for AM but also for LTO and their appropriateness for LTO should be evaluated – please see also Req. 16 od SSR 2/2 and SRS 57, section 3.2 and 3.3.
18.	4.20	Maintenance programmes that are consistent with [6] should be available and properly implemented for ageing management ~~and LTO evaluations~~ of applicable in-scope SSCs.	To focus on ageing management			X	Ageing of some SCs is addressed typically by maintenance programme (e.g. active SCs). That is why it is important for LTO evaluations. – please see also Req. 16 od SSR 2/2 and SRS 57, section 3.2 and 3.3.
19.	4.27	The environmental qualification should establish the equipment qualified life in order to ensure that ageing effects would not prevent satisfactory performance of the equipment for the approved operating period (possibly including LTO) if postulated ~~design basis~~ accidents were to occur.	No reason to limit to DBA. DEC are also to be considered.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
20.	4.33	ISI programmes that are consistent with [6] should be available and properly implemented for ageing management ~~and LTO evaluations~~ of applicable in-scope SSCs including consideration of baseline data.	To focus on ageing management See similar comment on 4.20			X	Ageing of some SCs is addressed typically by ISI programme. That is why it is important for LTO evaluations. – please see also Req. 16 od SSR 2/2 and SRS 57, section 3.2 and 3.3.
21.	4.38	The surveillance programmes including functional tests that are consistent with [6] should be available and properly implemented for ageing management ~~and LTO~~ evaluations of applicable in-scope SSCs.	To focus on ageing management See similar comment on 4.20			X	Ageing of some SCs is addressed typically by ISI programme. That is why it is important for LTO evaluations. – please see also Req. 16 od SSR 2/2 and SRS 57, section 3.2 and 3.3.
22.	5.13	A systematic scope setting (scoping) process to identify SCs subject to ageing management should be developed and implemented. ~~This scope setting is typically used also for LTO evaluations.~~	Superfluous. LTO is not limited to ageing assessment			X	It is obvious that LTO is not limited to ageing assessment but evaluation of SSCs for LTO is essential part of LTO activities - please see also SSR 2/2, Requirement 16, b.

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23.	Fig 3	Remove "and LTO" in the two bottom box	Consistency with comment on 5.22			X	It is obvious that LTO is not limited to ageing assessment but evaluation of SSCs for LTO is essential part of LTO activities - please see also SSR 2/2, Requirement 16, b.
24.	7.3	The operating organization should adopt a comprehensive project structure or similar organizational arrangement for preparation and implementation of the programme for LTO, ~~based on~~ considering arrangement for management of physical ageing as described in Section 5…	LTO project is not limited ageing management	X			
25.	7.4	Beside the existing obligations in connection to ageing management, the operating organization should clearly define the additional responsibilities and authorities for LTO preparation and implementation, after considering all the regulatory requirements relevant to LTO	Make link with regulatory process (7.2).	X			
26.	Fig 8	The "LTO assessment" boxes should be supplemented by a new box "Other regulatory requirements to be met for LTO"	The 3 currents boxes are focused on ageing. In France, one key item in preparing LTO for 900 MWe is finding modification narrowing the gap with GEN III reactors….	X			

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27.	7.7	A plant policy in the area of LTO should exist and should cover LTO principles and concept. <u>When LTO is connected to a regulatory process such as licence renewal or PSR, this policy should take account of it.</u>	Make link with regulatory process (7.2).	X			
28.	7.8	Delete 7.8	7.8 is confusing at it mixes areas where licensee has prime responsibility and area where the regulator has prime responsibility			X	These are basic general principals which should be valid in each MS, for operators and regulators.
29.	7.9	LTO ~~concept~~ <u>programme</u> should address basic	Clarification and consistency in wording			X	It is referring to LTO concept in Fig 8.

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30.	7.11 to 7.14	7.11 Concerning ageing management within an LTO programme: a) AMR and TLAA evaluation should have been completed previously in accordance with Section 5. If this has not been previously completed, then it should be completed for LTO. ~~7.12~~ b) Technological obsolescence should have been addressed previously in accordance with Section 6. If this has not been previously completed, then it should be completed for LTO. ~~7.13~~ c) The LTO assessment should demonstrate that the ageing effects will be adequately managed so that the intended functions can be maintained consistent with the plant's CLB for the planned period of LTO. ~~7.14 The approach to LTO assessment is outlined in Fig. 8. Overview of plant activities for LTO and should involve the following main steps:~~ ~~a~~d) Demonstration that the ageing effects will continue to be identified and managed for each SC in scope of LTO for the planned period of LTO (including the feedback of operating experience and research findings); and ~~b~~e) Review of TLAAs to ensure that the analyses continue to meet the criteria of 5.61.	These paragraphs are dealing with ageing management, thus only a part of LTO programme			X	TLAA and technological obsolescence are not ageing management. It would be confusing to mix it up.
31.	Title before 7.15	DEVELOPMENT OF AN AGEING MANAGEMENT PROGRAMME FOR LONG TERM OPERATION	To have title consistent with 7.17			X	This is a development of Programme for long term operation as defined by SSR 2/2, Requirement 16.

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32.	7.17	The ageing management programme for LTO should include…	Following bullets are aimed at ageing management			X	This is a development of Programme for long term operation as defined by SSR 2/2, Requirement 16.
33.	7.17 b) (iv)	(iv) Demonstration that these operational programmes and AMPs (including new programmes) are effective.	Clarification	X			
34.	7.17 e)	7.## ~~e)~~ The ~~implementation~~ programme for LTO should enable identifying the corrective actions and/or safety improvements required for safe LTO, respective schedule and plant commitments.	Make it a separate paragraph as it is broader than ageing management			X	This is a part of Programme for long term operation as defined by SSR 2/2, Requirement 16, f.
35.	Title before 7.18	SCOPE SETTING FOR AGEING MANAGMENENT OF SYSTEMS, STRUCTURES AND COMPONENTS FOR LTO	Following paragraph is aimed at ageing management			X	It is aimed at scope setting for LTO, please see SSR 2/2, Requirement 16, b.
36.	7.18	Scope setting for ageing management for LTO should follow the same approach identified in Section 5, accounting for differences in regulatory requirements, and codes and standards.	Clarification			X	It is aimed at scope setting for LTO, please see SSR 2/2, Requirement 16, b.
37.	7.21	Delete 7.21	As worded, 7.21 may imply that no ageing management review is needed if plant does not go for LTO. This would not be appropriate			X	Section 5 describes AMR during original design life time. This is appropriate when NPP is in preparation for LTO.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
38.	Title before 7.23	REVIEW OF PLANT AGEING MANAGEMENT PROGRAMMES FOR LTO	Following paragraphs are aimed at ageing management			X	This is focused on other Plant programmes, not on AMPs (please see SSR 2/2 Req. 16, a and SRS 57).
39.	Title before 7.26	LTO DOCUMENTATION RELATED TO AGEING	Following paragraphs are aimed at ageing management (see further comment on 7.35)			X	This is a documentation of Programme for long term operation as defined by SSR 2/2, Requirement 16.
40.	7.26 7.36	The assumptions, activities, evaluations, assessments, and results of the plant programme for LTO should be documented in accordance with national regulatory requirements as well as in accordance with the IAEA Safety Standards [2]. The documentation should be developed and retained in an auditable and retrievable form so that it provides a part of technical basis for approval of LTO.	Same idea and clarifies the purpose of documenting. Text is transferred from 7.36	X			
41.	7.35	Locate 7.35 before 7.38	This paragraph would be better located in the regulatory review and approval part			X	If it is placed before 7.38, it would be moved in Regulatory review part but it belongs to LTO documentation.
42.	7.36	Delete 7.36	See comment on 7.26	X			
/							

Germany

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)** (with comments of GRS) Page 1 of 5 Country/Organization: **Germany** Date: 2015-05-28				RESOLUTION			
Rele-vance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
2	1	1.1	Last sentence: "The General Safety Requirements publication on ~~Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety~~ Governmental, Legal and Regulatory Framework for Safety [4] addresses regulatory aspects throughout the operation of facilities and throughout the duration of associated activities and for any subsequent period of institutional control until there is no significant residual radiation hazard."	Please note that the Safety Requirements GS-R-1 have been replaced and superseded by GSR Part 1 in 2010. The document should refer to the valid IAEA Safety Standards Series publications.	X			
3	2	1.8/2	[Add footnote No. 1]	Indicated footnote is missing in the paper.	X	Footnote deleted.		
3	3	1.13	2nd sentence: "Economic assessment is covered by IAEA ~~NE~~ Nuclear Energy Series documents."	The abbreviation 'NE' is not introduced in the document. Therefore, its usage should be avoided here.	X			
2	4	1.14	Add new last sentence: "… The Safety Guide may be also used as a basis for ageing management of separate facilities for spent fuel storage and radioactive waste management. In this context, the Safety Guide SSG-15 on storage of spent fuel [23] recommends in Para 6.144: "An ageing management programme should be set up to deal with ageing related degradation. The programme should specify the monitoring necessary for early detection of any	The proposed amendment provides justification for extending the scope of DS485 to independent spent fuel storage facilities. The Safety Guide SSG-15 does not go into detail on how ageing management programmes for		IAEA approach is not to cite sentences from other SGs as they can change and become invalid.		

			deficiency." " Please add the Safety Guide SSG-15 to the list of references: "[23] INTERNATIONAL ATOMIC ENERGY AGENCY, Storage of Spent Nuclear Fuel, IAEA Safety Standards Series No. SSG-15, IAEA, Vienna (2012)."	independent spent fuel storage facilities should be established, implemented and improved.				
2	5	2.16/2	further prevention/ mitigation actions through appropriate maintenance and design modifications, including repair and	Not only mitigation, but also prevention actions	X			
3	6	3.31/2	The operating organization should justify that the physical status of SCs will be managed consistent with the current licensing basis[3] (CLB) ~~systems, structures and components~~ ~~systems, structures and components~~ for the LTO period.	Copying error	X			
2	7	3.37	1st sentence: "During the transition periods 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."	Clarification. The term 'shutdown' without further specification could also have the meanings 'planned shutdown', 'unplanned shutdown' or 'temporary shutdown'. The term 'permanent shutdown', as used in the Safety Requirements GSR Part 6 and in the Draft Safety Guide DS452 "Decommissioning of Nuclear Installations" (revision and combination of WS-G-2.1 and WS-G-2.4;	X			

				latest version dated 3 December 2014), means that the facility has ceased its operation and operation will not be recommenced.				
2	8	4.1/2	The following nuclear power plant programmes and documentation relevant to ageing management and LTO ~~(also referred as "preconditions for LTO")~~ should be in place at the plant:	Expression in brackets is misleading with regard to ageing management. If essential, a footnote should be used for LTO such as: "Plant programmes and documentation relevant to LTO are also called preconditions for LTO."	X			
3	9	4.3	"… in particular in documents like the safety analysis report (~~S~~SAR), PSR report or in other licensing basis documents."	The correct abbreviation for the term 'safety analysis report' is SAR.	X			
3	10	4.41	"Surveillance programmes should verify that the safety margins for LTO are adequate and provide~~s~~ a high tolerance for anticipated operational occurrences, errors and malfunctions."	Use plural to make the wording consistent with Paras 4.38 to 4.40.	X			
3	11	5.14	"A list or database of all SSCs in a nuclear power plant (such as a master list of SSCs) should be provided before implementing the scope setting process."	Missing word.	X			
3	12	5.25	1st bullet: "TLAA associated with these SCs should be evaluated to determine continued validity for the intended period of operation. Results of the TLAA(see Paras 5.63 to 5.67) evaluation should be taken into account in AMR ~~(see~~	To be more specific. A paragraph in Section 5 (here 5.25) should not simply refer to the same Section, but to the relevant paragraphs in	X			

			~~Section 5)~~;"	this Section.				
3	13	5.27	"All relevant ageing effects/ degradation mechanisms for each in-scope SC should be identified based on the understanding shown in ~~5.26~~ 5.28 and ~~5.27~~ 5.29."	Reference corrected	X			
3	14	5.43	2nd sentence: "Existing plant programmes should be coordinated to cover the activities shown in ~~5.37~~ 5.39."	Reference corrected	X			
3	15	5.49	2nd sentence: "Performance indicators about effectiveness of AMPs should be developed along with development of AMPs (see ~~5.56~~ 5.55)."	Reference corrected	X			
2	16	5.50	~~The SC specific or degradation mechanism specific AMPs provided in [5] should be considered as guidance for the development of AMPs.~~	Same information is given in paragraph 5.42.			X	Reference gives different information in different section.
3	17	5.63, 5.64, 5.66	Please replace the references [SR IGALL] and [IGALL SR] by [5].	Reference corrected.	X			
3	18	5.68	1st sentence: "The assumptions, activities, evaluations, assessments, and results of the evaluation of the plant programme for ageing management should be documented in accordance with national regulatory requirements as well as in accordance with the IAEA Safety Standards [2]."	Wording adjusted to be in line with the wording in Paras 5.71, 7.26, and 7.34.	X			
3	19	7.1/2	Detail information on programme for LTO ~~in~~ is provided in [21].	Misleading typing error	X			
2	20	7.14/1	The approach to LTO assessment is outlined in Fig. 8. Overview of ~~plant activities~~ major steps of programme for LTO and should	Actual caption inserted	X			
3	21	7.14	b) Review of TLAAs to ensure that the analyses continue to meet the criteria ~~of 5.61~~ specified in 5.66."	Reference corrected.	X			
2	22	7.16	~~TLAAs should be re-evaluated for the LTO~~	Delete sentence. Same			X	Content is not the

			~~period and demonstrated to meet the criteria of 5.7.~~	content than 7.14/b)				same – "main steps" in the first case and objective of activity in the second case.
3	23	7.25	TLAAs should be reviewed to determine continued acceptability of the analysed SC for the LTO period~~, consistent with 5.67~~. In this case, the time-dependent parameter is determined from a re-evaluation or analysis of plant operating history, which is projected to the end of the LTO period, to define a value of the parameter that applies to, or bounds the expected value of the parameter at the end of the LTO period. The value of the time-dependent parameter applicable to the LTO period is used to re-evaluate the analysis parameter, consistent with ~~5.67~~ 5.66.	No need to mention reference twice in this para. Moreover, reference No. (5.67) has to be corrected.	X			
3	24	7.27/1	The documentation should provide detailed information on each element outlined in para ~~7.14~~7.17,	Reference corrected	X			
2	25	Ref. [4]	"INTERNATIONAL ATOMIC ENERGY AGENCY, ~~Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety,~~ Governmental, Legal and Regulatory Framework for Safety, IAEA Safety Standards Series No. ~~GS-R-1,~~ GSR Part 1, IAEA, Vienna ~~(2000)~~ (2010)."	Please note that the Safety Requirements GS-R-1 have been replaced and superseded by GSR Part 1 in 2010. The document should refer to the valid IAEA Safety Standards Series publications.	X			
3	26	Ref. [8]	"INTERNATIONAL ATOMIC ENERGY AGENCY, Periodic Safety Review ~~of~~ for Nuclear Power Plants, Safety Standards Series No. SSG-25, IAEA, Vienna (2013)."	Citation of the correct title of SSG-25.	X			

TITLE Japan NUSSC Comments for DS 485 Draft 09042015 09 April 2015

COMMENTS BY REVIEWER Reviewer: Page 1 of Country/Organization: Japan/NRA Date: 5 June 2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
1	General comment	Clarify relationship between this document and SSG-25 on Priodic Safety Review for Nuclear Power Plants" for user-friendliness. Suggest to add description to para 1.8. Proposed text 1.8. This publication is a revision of a Safety Guide issued in 2009 as IAEA Safety Standards Series No. NS-G-2.12, Ageing Management for Nuclear Power Plants1, and supersedes it. This revision takes into account developments in the international ageing lessons learned for nuclear power plants and expands the scope to include provisions for maintaining safety of nuclear power plants during long term operation. IAEA Safety Standards Series No. SSG-25, "Priodic Safety Review for Nuclear Power Plants", address some aspect of aging management and long term operation briefly. This publication is developed more specifically in the area of both aging management and long term operation beyond initially defined lifetime of nuclear power plants based on the description described in SSG-25.			IAEA Safety Standards Series No. SSG-25, "Periodic Safety Review for Nuclear Power Plants" addresses also some aspect of physical ageing of SSCs and focuses more on non-physical ageing of SSCs, i.e. their becoming out of date in comparison with current knowledge, codes, standards and regulations, and technology.		
2	1.4/ Page 5	Add reference; 1.4. Effective ageing management of SSCs is a key element of the safe and reliable operation of nuclear power plants. In order to assist Member States, the IAEA has developed a comprehensive set of publications, e.g. [5],[5a]. List of reference [5a] IAEA, Approaches to Ageing Management for Nuclear Power Plants International Generic Ageing Lessons Learned (IGALL) Final Report, TECDOC series No. IAEA-TECDOC-1736 (2014)	Ref [5a] gives useful actual practices on aging management of Member States.			X	It is not allowed to make reference in Safety Standards to TECDOC level documents.

COMMENTS BY REVIEWER Reviewer: Page 1 of Country/Organization: Japan/NRA Date: 5 June 2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
3	2.29 Page 11	Considering long term operation being one of the licensing process of NPPs, non-physical aging issues such as obsolescence of knowledge and compliance with current regulations, codes and standards should be addressed. Modify as follows; 2.29. Conceptual aspects of obsolescence such as obsolescence of knowledge and compliance with current regulations, codes and standards are addressed in Requirement 5 and 12 of [2] and Safety Factor 2 and 8 of [8], that deal with safety policy and the PSR. These aspects are not addressed in the section of ageing management in this Safety Guide.	Long term operation beyond initially specified lifetime is one of the licensing processes of NPPs. Therefore, all aspect of ageing elements, including physical ageing issues and non-physical ageing issues should be addressed in section 7 "Programme for long term operation. Furthermore, descriptions on obsolescence in ref [8] (SSG-25) are limited to plant systems and equipment, and does not include non-physical obsolescence.			X	Conceptual aspects of obsolescence are out of scope of this SG and are typically addressed by SSG-25 ("compliance with current regulations, codes and standards") and knowledge management programmes ("obsolescence of knowledge").
4	Table 1 Page 12	Add "Reduced capability for long team operation" to column of Consequences of Technology.	To keep consistency with the original NS-G-2.12.			X	Existing warding has basically same meaning but is more specific.
5	5.27 Page 26	5.27 All relevant ageing effects/ degradation mechanisms for each in-scope SC should be identified based on the understanding shown in ~~5.26~~ 5.25 and ~~5.27~~ 5.26.	Confirming and change of referring paragraphs.	X			
6	Fig.5 Page 30	Change the title of box "CHECK" to keep consistency with the title of Fig.5. ~~Monitoring of effectiveness~~ Review of AMPs	The title of Fig.5 is "*Development, implementation, review and improvement of AMPs", and title of box "Do" is "Implementation of AMPs" and box "Action" is "Improvement of AMPs", then*	X			

COMMENTS BY REVIEWER Reviewer: Page 1 of Country/Organization: Japan/NRA Date: 5 June 2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
			title of box "Check" should be "Review of AMPs".				

EC-JRC

COMMENTS BY REVIEWER Reviewer: EC-JRC Page...1. of.2... Country/Organization: EC Date: 20.5.2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Title of the document	Ageing Management and Programme for Long Term Operation of Nuclear Power Plants	Improve the title. Better use "of Nuclear Power Plants" that "for Nuclear Power Plants".	X			
2		Include a list of abbreviations at the beginning of the document	To help the reading of the document			X	IAEA publication standards require to explain abbreviations at their first appearance rather than creating list.
3	Para 2.8 of page 7	Change "…all phases of operation cycles, design…" by "..the entire life cycle of the plant i.e. in design…"	correction	X			
4	Last line of page 16	Change "(SSAR)" by "(SAR)"	correction	X			

5	Para 5.27 of page 28	Change "…shown in 5.26 and 5.27." by "…shown in 5.25 and 5.26."	correction	X			
6	Para 5.43 of page 31	Change "..shown in 5.37." by "…shown in 5.39."	correction	X			
7	Para 5.49 of page 31	Change "..(see 5.56)" by "..(see 5.55)"	correction	X			
8	Para 7.14 of page 39	Change "…criteria of 5.61." by "…criteria of 5.63."	correction	X			
9	Para 7.16 of page 39	Change "…criteria of 5.67." by "…criteria of 5.66."	correction	X			
10	Para 7.25 of page 41	Change "…with 5.67." by "…with 5.66." in two places (on the second and last lines of the para)	correction	X			
11	Para 7.27 of page 41	Change "…in para 7.14" by "…in para 7.17"	correction	X			
12	In all the document	Harmonize the nomenclature of the figures when mentioned in the text (see for example: FIG. 7, Fig. 7, Figure 6,….)	Harmonize text	X			

Korea

COMMENTS BY REVIEWER Country/Organization: Republic of Korea / Korea Institute of Nuclear Safety (KINS) Date: May 20, 2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General Comment	A list of Abbreviations is required	To increase readability			X	IAEA publication standards require to explain abbreviations at their first appearance rather than creating list.
2	Page 34 §5.63	5.63 TLAAs should meet all six of the following criteria ~~[SR IGALL]~~ [IGALL SR]:	For the sake of consistency, it is proposed to replace '[SR IGALL]' by '[IGALL SR]' such as section 5.64 [IGALL SR] and 5.66 [IGALL SR].		Changed to [5] as requested by other MS.		
3	Page 35 §5.67	5.67 If the TLAA cannot be found acceptable using (i), (ii), or (iii), then corrective actions should be implemented. Depending on the specific analysis, corrective actions could include: - Refinement of the analysis to remove excess conservatism; - Implementation of ~~further operation~~, maintenance or AMP actions; or - Modification, repair or replacement of the SC.	Further operation should not be one of the corrective actions when the TLAA cannot be found acceptable. That action is not also included in the corrective actions as followings provided in [IGALL SR] : - Refinement of the analysis to remove excess conservatism; or - Repair or replacement of the component, depending on the specific analysis.	X			
4	Page 39	7.14 b) Review of TLAAs to ensure	To correct the wrong		Changed to 5.66		

COMMENTS BY REVIEWER Country/Organization: Republic of Korea / Korea Institute of Nuclear Safety (KINS) Date: May 20, 2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	§7.14 §7.15	that the analyses continue to meet the criteria of ~~5.61~~5.63 7.15 TLAAs should be re-evaluated for the LTO period and demonstrated to meet the criteria of ~~5.67~~5.63.	paragraph numbers		where are acceptance criteria.		
5	Page 41 §7.28	7.28 The documentation should also include the following to demonstrate that ageing effects will be managed during the LTO period: - Description of plant programmes and documentation relevant to ageing management ~~and~~ during LTO; - List of commitments for improvement or development of plant programmes and documentation relevant to ageing management ~~and~~ during LTO, and implementation of AMPs.	Clarification of the difference between para. 5.69 [Documentation of Ageing management] and para. 7.28[LTO Documentation].	X			

South Africa

COMMENTS BY REVIEWER Reviewer: NUSSC Page.... of.... Country/Organization: South Africa Date: 29 May 2015				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Title	LTO of NPPs	Agree with other reviewer.	X			
2	Title	"… **for** Nuclear Power Plants …"should read "… **of** Nuclear Power Plants …"	Grammar corrected.	X			

3	Abbreviations		A section on abbreviations should be added for clarifications and user friendliness for quick referencing, e.g. LTO, CLB,SC, AMR, TLAA, PSA, AMP, PSR and SAR.			X	IAEA publication standards require to explain abbreviations at their first appearance rather than creating list.
4	4.3, Last line on page 16	SAR	SAR is the abbreviation for Safety analysis report not SSAR	X			
5	All	Figure	It is referred to as FIG and Fig – better to use Figure consistently.	X			
6	5.41 Last sentence	Plant specific PSA results may be used to determine the specific SCs of the population that will be inspected, given that the PSA is a Living PSA.	Failure rates can change with time.	X			
7	Page 40, last line		Title should be moved to top of Page 41.	X			

USA

COMMENTS BY REVIEWER	RESOLUTION
Reviewer: U.S. Nuclear Regulatory Commission/ NUSSC Country/Organization: United States of America Date: 6/09/2015	

Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	"Safety function" has been replaced with "intended function" throughout the document.	"Intended function" is a broader term that addresses both safety and non-safety SCs, consistent with the scope of ageing management and LTO.	X			
2	General	"Corrective actions" program is added as an essential existing plant programme.	This program is essential to effective ageing management throughout the plant lifetime.	X			
3	General	"Plant lifetime" is proposed in many places in the document.	To provide consistent terminology.	X			
4	General	The guidance should provide vivid examples of obsolesces that could impact ageing management plans before license termination of NPP facilities. For example, if certain components can only be controlled using current software, after a certain period, such software could be obsolete or outdated. Therefore, an early action should be considered to use current software (e.g. to dismantle or manage certain components) in order to avoid problems arising from obsolete software.	Completeness and clarity to address obsolesces & ageing management new concepts particularly after shut down before license termination.	X			
5	general	The document has 8 figures and 2 tables that are not defined in TOC. The TOC and document would be	The document would be easier to read		Structure of ToC will be adjusted by		

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission/ NUSSC Country/Organization: United States of America Date: 6/09/2015				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		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.			IAEA editor in accordance with IAEA rules.		
6	general	There should be an acronym list. There are inconsistencies that would be picked up in the process, such as SR IGALL vs. IGALL SR and SSAR vs SAR	The document would be easier to read. Not all acronyms are defined on 1st use (QMS, SSR, SR, FSAR)			X	IAEA publication standards require to explain abbreviations at their first appearance rather than creating list.
7	general	Global comment on formatting – there are sections where there are large gaps (pp 6, 9, 11, 21, 26, 37). Both tables have font too small.	consistency in layout		Formatting will be adjusted by IAEA editor in accordance with IAEA rules.		
8	1.4	"…the IAEA has developed a comprehensive set of publications, e.g. [the International Generic Aging Lessons Learned, IGALL, 5].	Since only IGALL is referenced here, it should be called out. It is not defined otherwise until the reference list.	X			
9	1.8	{Need to add Footnote 1 to the document}	Correction		Footnote 1 eliminated.		

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission/ NUSSC Country/Organization: United States of America Date: 6/09/2015				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
10	1.10	The Safety Guide provides good international practices on establishing, implementing and improving both ageing management and ~~on~~ a programme for safe LTO for nuclear power plants.	Editorial comment for clarity.	X			
11	1.13.	"...Economic assessment is covered ~~by~~ in IAEA NE Series documents."	Editorial comment for clarity.	X			
12	1.14.	This Safety Guide is intended to provide recommendations on ageing management and programme for LTO for nuclear power plants. This Safety Guide also includes ~~also~~ facilities for spent fuel storage and radioactive waste management which are part of the plant. The Safety Guide also may be ~~also~~ used as a basis for ageing management of separate facilities for spent fuel storage and radioactive waste management.	Editorial comment for clarity.	X			
13	Para 1.14	Para 1.14 stated the scope of the	Completeness to address			X	SG does not provide

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission/ NUSSC Country/Organization: United States of America Date: 6/09/2015				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		guidance to include among others "...facilities for spent fuel storage and radioactive waste management which are part of the plant." In this context, the safety guide did not address any key issues pertaining to radioactive waste management. Onsite storage of radioactive waste including liquid waste stored in tanks need to be addressed to prevent leaks or releases of radioactive materials due to ageing of storage components. In addition, the document should address waste stabilization to minimize potential releases due to ageing of waste storage containers or facilities.	mitigation measures to counter ageing of radioactive waste containers or storage facilities.				solutions for each component or structure in a scope. It provided general guidance valid for all in-scope SSCs. Concrete guidance for each SSCs is provided in IGALL SRS, if proven practices exists.
14	2.8.	Ageing management covers all activities to appropriately prevent or control ageing effects within acceptable limits through all phases of ~~operation cycles,~~ plant lifetime, including design, fabrication/ construction, commissioning, operation	Clarification	X	Change already requested by other MS.		

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission/ NUSSC Country/Organization: United States of America Date: 6/09/2015				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		including LTO, and decommissioning including long term shutdown as described in Section 3.					
15	Ageing Management during decommissioning Paras 2.8, 3.37 & 3.38	Para 2.8 stated: *"Ageing management covers all activities to appropriately prevent or control ageing effects within acceptable limits through all phases of operation cycles, design, fabrication/ construction, commissioning, operation including LTO, decommissioning including long term shutdown as described in Section 3.* Para 3.7 stated: appropriate ageing management arrangements should be evaluated to ensure that required SSCs remain available and functional. As stated in Para 2.8, DS485 covers ageing management issues during the life cycle of NPPS including decommissioning. After shut down, during the transition period before license termination (LTR), the time frame could extend several decades before completion of decommissioning and before submission of a license termination	Completeness to address ageing management during long-term transitioning into decommissioning after shut down to address: • Long-term integrity of SSCs to prevent its deterioration and ensure safe dismantling, handling, and transport of components before license termination; • Monitoring of SSCs to ensure containment integrity and ensure no significant radioactive releases during the long-term transition period before license termination. • Ensure integrity of	X			

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission/ NUSSC Country/Organization: United States of America Date: 6/09/2015				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		plan. In this regard, ageing management should be addressed in more detail using in different perspective than during operation. Para 3.7 mentioned briefly that "SSCs remain available and functional." It is unclear how SSCs can be functional after several decades of shut down. In this context the guidance should explicitly indicate that after shut down during long-term transitioning into decommissioning. Therefore, the following specific ageing management should be added to Para 3.8: • Long-term integrity of SSCs to prevent its deterioration and ensure safe dismantling, handling, and transport of components before license termination; • Monitoring of SSCs to ensure containment integrity and	subsurface infrastructure components. • Monitor potential spread of contamination from previous releases, particularly radionuclide transport in groundwater cycle, and employ effective measures to minimize spread of contamination.				

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission/ NUSSC Country/Organization: United States of America Date: 6/09/2015				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		ensure no significant radioactive releases during the long-term transition period before license termination. • Ensure integrity of subsurface infrastructure components. • Monitor potential spread of contamination from previous releases particularly radionuclide transport in groundwater cycle and conduct effective measure to minimize spread of contamination.					
16	2.18.	~~To ensure that a consistent approach is taken to define and implement ageing management, ageing~~ Ageing management programmes (AMPs) are developed ~~consistent with~~ using a structured approach, to ensure a consistent approach for defining and implementing ageing management, as described in Section 5.	Editorial comment for clarity.	X			
17	2.19.	Existing plant programmes, including those for maintenance, equipment	Editorial comment for clarity.	X			

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission/ NUSSC Country/Organization: United States of America Date: 6/09/2015				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		qualification, in-service inspection, surveillance, and water chemistry ~~programmes~~, are used, where appropriate, to manage ageing of ~~a structure~~ an SC, or ~~component, or~~ ageing ~~effect~~ effects/ degradation ~~mechanism~~ mechanisms as described in Section 4.					
18	2.21.	In practice, ageing effects and degradation mechanisms are studied and managed at the ~~structure or component (SC)~~ SC level (i.e. SC level ageing management). However, the AMPs for individual SCs may be integrated into an AMP at the ~~level of systems~~ system and/or ~~a~~ plant level.	Editorial comment for clarity.	X			
19	2.22.	Time limited ageing analyses (TLAAs) (also termed safety analyses that use time limited assumptions) are applied, in certain cases[2], to demonstrate that the analyzed ageing effects will ~~be effectively~~	More accurately, TLAAs are used to demonstrate that ageing effects will not affect the ability of the SC to perform its intended function.	X			

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission/ NUSSC Country/Organization: United States of America Date: 6/09/2015				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		~~managed~~ not adversely affect the ability of the SC to perform its intended function throughout an assumed period of operation, as described in Section 5.					
20	2.26.	There are several ~~typical kinds~~ types of obsolescence. ~~Its~~ The subject, manifestation, consequences and management approaches for several types of obsolescence are shown in Table 1.	Editorial comment for clarity.	X			
21	2.32.	If a decision is taken to pursue LTO, it is important to provide justification ~~by~~ of the adequacy of ageing management for the LTO period, based on the results of PSRs [8] or the results of an adequate evaluation process (including scope setting, ageing management review (AMR), and TLAA revalidation as discussed in this Safety Guide), and overseen by the regulatory body.	Editorial comment for clarity.	X			
22	3.8.	Appropriate measures should be taken, such as introducing specific ~~design~~ features~~, in~~	Editorial comment for clarity.	X			

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission/ NUSSC Country/Organization: United States of America Date: 6/09/2015				RESOLUTION			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		during the design phase, to facilitate effective ageing management throughout the operation phase of the plant. Such measures should also be applied to modifications and to the replacement of equipment or components. Reference [1], Requirements 30 and 31 establish the design related requirements on ageing management of SSCs that are important to safety.					
23	3.9	The operational states and accident conditions are taken into account in equipment qualification ~~(EQ)~~ programmes.	The EQ abbreviation is not used elsewhere in this document. To avoid confusion with environmental qualification, the abbreviation should be deleted.	X			
24	3.9.	In the design phase, the following should be ensured: – The operational states and accident conditions are taken into account in equipment qualification (EQ)	Editorial comment for clarity.	X			

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Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		programmes. – The in-service and accident environmental conditions are taken into account. All potential ageing effects/ degradation mechanisms for passive and active safety functions of SSCs are identified, evaluated and taken into account. Examples are provided in [5]. – Relevant experience (including experience from construction, commissioning, operation and decommissioning of nuclear power plants) and research results are reviewed and taken into account. – ~~The advanced~~ Advanced materials with greater ageing resistant properties are used.					

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		– ~~The materials~~ Materials testing programmes for periodic monitoring of ageing effects during plant operation are implemented. – ~~The on~~ On-line monitoring is implemented, particularly where this technology would provide forewarning of degradation leading to failure of SSCs and where the consequences of failure could be important to safety.					
25	3.11	Ageing management should be included as a topic in the general design criteria and should be addressed in the safety analysis report. Discussion of ageing management in the SAR should include the following topics [10]:	The additional wording is needed for clarity.	X			
26	3.15.	The operating organization should establish a programme for measuring and recording baseline data relevant to ageing management for all in-scope SSCs. This programme should	Editorial comment for clarity.	X			

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		include ~~also~~ mapping the actual environmental conditions in each critical ~~spot~~ location of the plant to ensure that they are in compliance with the design.					
27	3.16.	"...All parameters that can influence degradation mechanisms should be identified as early as possible, ~~should be~~ monitored if possible and ~~should be~~ tracked throughout plant operation.	Editorial comment for clarity.	X			
28	3.17.	The operating organization should collect baseline data and ~~should~~ also confirm that critical service conditions (as used in equipment qualification) are in compliance with the design. Analyses of such data should be subject ~~of~~ to review by the regulatory body as part of its inspection programme.	Editorial comment for clarity.	X			
29	3.18.	The operating organization should ~~pay attention not~~ ensure that SSCs are not subjected to ~~put~~ unnecessary stresses ~~on~~	Editorial comment for clarity.	X			

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		~~SSCs~~ by the tests performed during commissioning that are not ~~taken into account~~ accounted for in the design ~~and~~ or could cause premature ageing. The operating organization should properly document and record the testing results during commissioning, in order to allow investigation of possible cases of subsequent premature ageing that may be ~~explained~~ caused by improper execution of ~~some~~ testing.					
30	3.24.	The operating organization should ensure corrective actions are followed or taken to prevent~~/~~, mitigate or correct ageing effects of SCs through the appropriate maintenance, repair and replacement or modification of ~~a~~ an SC, and / or appropriate changes to relevant plant operations, programmes and documentation.	Editorial comment for clarity.	X			
31	3.25	...process conditions (e.g.,	Editorial comment for	X			

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		temperature, flow pattern, velocity, vibration, radiation) that could affect ageing ~~and~~ or lead to the failure of SSCs, ~~and~~ ~~if~~. If necessary, an ~~ageing management review~~ AMR is completed for the affected SSCs.	clarity.				
32	3.29.	...If either a new ageing effect or degradation mechanism is discovered (e.g. through feedback of operating experience or ~~research~~ R&D), the operating organization should perform an appropriate ~~ageing management review~~ AMR and implement additional ageing management as ~~determined to be~~ necessary.	Editorial comment for clarity.	X			
33	3.31.	The operating organization should justify that the physical status of SCs will be managed consistent with the current licensing basis[3] (CLB) ~~systems, structures and components systems,~~	Clarify additional actions that are suitable if a TLAA cannot be revalidated for the LTO period.	X			

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		~~structures and components~~ for the LTO period. The operating organization should review and validate the existing AMPs for all in-scope SCs that have an impact on the performance of systems important to safety. For these SCs, the operating organization should identify all TLAAs and demonstrate that ~~all~~ either these analyses will remain valid for the LTO period, the SCs are replaced, or that further operation, maintenance or AMP actions are implemented.					
34	Footnote 3 (3.31)	...final safety analysis report (FSAR)...	FSAR is not defined in the document. It first appears in footnote 3.		Changed to SAR.		
35	3.37.	...Such provisions should be consistent with national ~~licensing requirements~~ regulations.	Editorial comment for clarity.	X			
36	3.38.	The operating organization should establish and implement ageing management activities in	Editorial comment for clarity.	X			

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		decommissioning plans and procedures for SSCs that are required to remain available and functional during the decommissioning phase.					
37	4.1	The following nuclear power plant programmes and documentation relevant to ageing management and LTO (also referred as "preconditions for LTO") should be in place at the plant: – Safety analysis report ~~or~~ and other CLB documents; – Configuration/modification management programme, including design basis documentation;	Editorial comment for clarity.	X			
38	4.3	Ageing management policy and justification of LTO should be properly documented in the CLB, in particular in documents like the safety analysis report (~~SSAR~~SAR), the final safety analysis report (FSAR), PSR	To clarify that the SAR and FSAR, are appropriate names for the governing plant safety analysis report.		Changed to SAR as also requested by other MS.		

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		report or in other licensing basis documents.					
39	4.5	The SAR should provide descriptions of activities to justify safe ~~long term operation~~ LTO to ensure that licensees maintain the information to reflect the current status of the plant and ~~addresses~~ address new issues as they arise.	Editorial comment for clarity.	X			
40	4.6	The PSR is a comprehensive assessment of the plant safety [2]. The content and the scope of the PSR should be consistent with [8]. Some of the PSR safety factors are closely related to aging management. ~~When assessing the ageing management and long term operation,~~ The operating organization should particularly consider:	PSR is not limited to LTO.	X			
41	4.6	- Adequacy of the design (Safety Factor 1) of the nuclear power plant and its documentation by assessment against the CLB and national and international standards,	Editorial comment for clarity.	X			

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		requirements and practices; ~~The~~ Thoroughly documenting the actual condition of ~~SSCs important to safety (Safety Factor 2) documenting thoroughly the condition of~~ each SSC important to safety. (Safety Factor 2). Knowledge of any existing or anticipated obsolescence of plant systems and equipment should be considered part of such a safety assessment; Whether qualification of equipment important to safety (Safety Factor 3) is being maintained through an adequate programme ~~of~~ that includes maintenance, inspection and testing ~~that~~, and provides ~~confidence in the delivery of~~ assurance that safety functions ~~until~~ will be maintained at least until the next PSR. The ~~ageing~~ effects of ageing on nuclear power plant safety, the effectiveness of AMPs and the need for improvements to					

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		AMPs, as well as the obsolescence of technology used in the nuclear power plant is part of such assessment (Safety Factor 4).					
42	4.8	The assessment should also consider the plant's safety performance indicators, plant-specific operating experience, generic operating experience from other nuclear power plants, and national and international research findings, which can reveal previously unknown safety weaknesses.	Editorial comment for clarity.	X			
43	4.9	As the plant preparation for safe LTO usually includes ~~usually increased amount~~ a number of ~~safety~~ important safety modifications and refurbishments, the plant should follow a configuration management/ modification management programme [1; 2; 11] ~~encompassing~~ to reflect the evolving status of the plant.	Editorial comment for clarity.	X			
44	4.18	~~Existing~~ The existing plant	Add "Corrective	X			

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Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		programmes listed below should be considered ~~as~~ essential to ageing management and LTO: a) Maintenance; b) Equipment qualification; c) In-service inspection (ISI); d) Surveillance; e) Water chemistry.; f) Corrective actions.	actions" programme as an essential existing plant programme				
45	4.26	The environmental qualification should demonstrate that the component is, at the end of its qualified life, capable of performing its intended ~~functions~~ function(s) under the full range of specified service conditions.	Clarify that the component may have multiple functions.	X			
46	4.30	The equipment qualification status should be properly documented and ~~should be~~ maintained ~~over the~~ throughout plant life ~~time~~. The equipment qualification ~~documentations~~ documentation, which is typically part of the equipment	Editorial comment for clarity.	X			

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		qualification programme should include:					
47	4.39	The surveillance programmes should confirm the provisions for safe operation that were considered during the design phase, ~~checked~~ assessed during construction and commissioning, and verified throughout operation.	Editorial comment for clarity.	X			
48	4.40	Surveillance programmes should continue to supply data by monitoring relevant parameters to be used for assessing the service life of SSCs for the planned period of LTO, for example through existing or additionally installed temperature~~,~~ and pressure measurements, or additional diagnostic systems.	Editorial comment for clarity.	X			
49	4.41	Surveillance programmes should verify that the safety margins for LTO are adequate and ~~provides~~ provide a high tolerance for anticipated operational occurrences, errors and malfunctions.	Editorial comment for clarity.	X			

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50	4.42	Particular attention should be paid to the following aspects: – … – Availability of safety systems such as the reactor protection system, the safety system actuation systems and the safety system support features [14]; – Availability of items ~~which~~ whose failure could adversely affect safety; – Functional testing in accordance with Requirement 31 of [2] to ensure that the tested SSCs are capable of performing their design safety function(s).	Editorial comment for clarity.	X			
51	4.45	A water chemistry programme is essential for the safe operation of a nuclear power plant and should be available [15]. ~~It~~ The program should ensure that degradation due to water chemistry stressors do not impact the ability of SSCs to perform ~~the necessary safety~~ their intended functions, in	Editorial comment for clarity.	X			

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		accordance with the assumptions and intent of the design. A chemistry programme should minimize the harmful effects of chemical impurities and corrosion on plant SSCs.					
52	After 4.48	**Corrective actions**	Add corrective actions program description as an essential existing plant programme.	X			
53	4.49	A corrective action programme should be implemented to ensure that conditions adverse to quality, such as age-related degradation, are identified and that corrective actions commensurate with the significance of the issue have been identified and implemented.	Add corrective actions program description as an essential existing plant programme.	X			
54	4.50	The corrective action programme should document occurrences of identified age-related degradation (conditions adverse to quality) and the methods used address the degradation, such as evaluation and acceptance, evaluation and monitoring, repair,	Add corrective actions program description as an essential existing plant programme.	X			

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		or replacement, and consider this information as plant-specific operating experience.					
55	4.51	The corrective action programme should document modifications made to ageing management programmes, system configuration, or plant operations that are required to manage the occurrence or severity of the ageing effect.	Add corrective actions program description as an essential existing plant programme.	X			
56	4.52	The corrective action programme entries and the associated plant-specific operating experience should be routinely reviewed by the responsible ageing management programme owners. The review should determine whether ageing management programmes need to be enhanced to ensure that the programme is effective in managing the ageing effects for which it is credited.	Add corrective actions program description as an essential existing plant programme.	X			
57	4.53	If it is determined, through the evaluation of the corrective action programme entries and the associated plant-specific	Add corrective actions program description as an essential existing plant programme.	X			

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		operating experience, that the ageing management programme does not adequately manage the effects of ageing, a new ageing management programme should be developed or modifications to existing programmes should be identified and implemented, as appropriate.					
58	5.1	For the implementation of the plant programme for ageing management, the policy and objectives of the programme should be in place ~~allocating~~ to identify and allocate the necessary resources...	Editorial comment for clarity.	X			
59	5.4	The responsibilities of the ageing management entity should include: – Development of the plant's effective ageing management programme; – Coordination of relevant existing and new plant programmes; – Systematic monitoring of relevant operating experience and ~~research~~	Editorial comment for clarity.	X			

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		~~and development~~ R&D results, and evaluation of their applicability to the nuclear power plant; – … – Performing periodic self-assessments; and – Improvement of activities relating to AMPs.					
60	5.5	Management of complex ageing issues may require an interdisciplinary approach. The members of the ageing management teams (see Fig. 2) should include experts from operations, maintenance, engineering, equipment qualification, design and ~~research and development~~ R&D, depending on the evaluations necessary. If necessary, external organizations should be requested to provide expert services on specific topics, ~~e.g.~~ such as condition assessments, research, and standards development.	Editorial comment for clarity.	X			

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61	5.6	Responsibilities for the implementation of AMPs and for reporting on ~~the SSCs~~ SSC performance should be defined and allocated within the plant organization (e.g., operations, maintenance and engineering).	Editorial comment for clarity.	X			
62	5.7	Training on the ageing effects of SSCs should be provided for staff involved in operations, maintenance and engineering, to enable them to make an informed and ~~positive~~ effective contribution to ~~the~~ ageing management.	Editorial comment for clarity.	X			
63	5.8	Relevant plant and industry operating experience should be systematically collected and evaluated, and should be used for improving the AMPs.	Editorial comment for clarity.	X			
64	5.9	A data collection and record keeping system should be in place as a necessary base for the support of ~~the~~ ageing management ~~should be in place~~. Examples of data that should be included in the data collection and record keeping system are shown in [20].	Editorial comment for clarity.	X			
65	5.10	~~Such a~~ The data collection and record keeping system should be established in the early ~~in the~~ stages of plant life (ideally, data should be collected from the construction stage onwards) in order to provide information for the following activities:	Editorial comment for clarity.	X			
66	5.11	To facilitate obtaining the	Editorial comment for	X			

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		necessary quality and quantity of ageing related data from plant operation, maintenance and engineering, representatives of the operations, maintenance and engineering units should be involved in the development and ~~maintaining~~ maintenance of the data collection and record keeping system.	clarity.				
67	5.13	A systematic scope setting (scoping) process to identify SCs subject to ageing management should be developed and implemented. This scope setting is also typically used ~~also~~ for LTO evaluations.	Editorial comment for clarity.	X			
68	5.14	A list or database of all SSCs in ~~a~~ the nuclear power plant (such as a master list of SSCs) should be provided before implementing the scope setting process.	Editorial comment for clarity.	X			
69	5.15	Other SSCs whose failure may prevent SSCs important to safety from ~~fulfil the fundamental~~ fulfilling their intended safety functions. Related examples of potential failures are: ○ Rotating ~~machines~~	Editorial comment for clarity.	X			

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		~~missiles~~ machines' missile impact; ○ Lifting equipment failures; ○ Flooding; ○ High energy line break; and ○ ~~Leaked liquid drop.~~ ○ Leaked liquids (e.g. from piping or other pressure boundary components). Other SSCs that are credited in safety analyses (deterministic and probabilistic) to perform ~~a~~ the function ~~in~~ of coping with certain ~~type~~ types of events should be included in the scope, consistent with national regulatory requirements, e.g.: ○ …; ○ SSCs needed to cope with specific regulated events, e.g. pressurized thermal shock, anticipated transient without scram and station blackout; …					
70	5.17	Items that are subject to periodic replacement or scheduled refurbishment can be excluded from the scope, unless required by national regulatory requirements, as	Editorial comment for clarity.	X			

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		long as the replacement or refurbishment is based on a manufacturer's recommendation or other basis and not on an assessment of the condition of the item, which would be implementation of ageing management for the item.					
71	Fig. 3 (5.21)	Does the SSC's failure impact the safety function(s) of other SSCs?	Clarity that this is non-safety SSC whose failure could affect safety SSC.	X			
72	Fig. 3 (5.21)	~~Is~~ Does the SC meet these ~~following~~ criteria: • ~~at the same time~~ short-lived, subject to replacement or refurbishment plan, and not required by the national regulation to be included in the scope~~?~~	Editorial comment for clarity.	X	Corrected to make it clear.		
73	5.23	The AMR should systematically assess ageing effects and their related degradation mechanisms that have been experienced or are anticipated. The assessment should include ~~assessment~~ an evaluation of the impact of the ageing effects on the ~~ability of~~ in-scope ~~SCs~~ SCs' ability to	Editorial comment for clarity.	X			

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		perform ~~their functions~~ their intended function(s) identified in 5.15.					
74	5.25	TLAAs associated with these SCs should be evaluated to determine continued validity for the intended period of operation. Results of the TLAA evaluation (see 5.66)); should be taken into account in the AMR ~~(see Section 5)~~;	Editorial comment for clarity.	X			
75	5.27	All relevant ageing effects/ degradation mechanisms for each in-scope SC should be identified based on the understanding shown in 5.26, 5.28 and 5.~~27~~ 29.	Editorial comment for clarity.	X			
76	5.29	The identification process should take into account knowledge of the ageing effect characteristics (e.g., necessary conditions under which it occurs, rates of degradation, etc.), ~~of the ageing effects and.~~), the related degradation mechanisms and their impact on the SC's intended function(s~~) of SCs.~~).	Editorial comment for clarity.	X			
77	5.34	An identification and listing of SCs subject to an AMR and their ~~safety functions;~~ intended function(s); The information sources used to accomplish the above, and	Editorial comment for clarity.	X			

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		any discussion needed to clarify their use.					
78	5.36	If this documentation uses IGALL ~~generic industry references~~ [5],	Clarification and consistency in wording	X			
79	Fig 5 (5.37)	Under "Plan," "QMS plans for AMPS"	Define in narrative, not clear what is meant	X			
80	Fig 5 (5.37)	Middle box • Relevant plant-specific and industry operational experience	Editorial comment for clarity.	X			
81	Fig 5 (5.37)	"Check" box: • Re-evaluation of AMPs against the nine AMP attributes (see Table 2)	Editorial comment for clarity.	X			
82	5.40	If necessary, more than one type of AMP should be implemented to ensure that the ageing effects are adequately managed and that the ~~safety~~ intended function(s) of the ~~structure or component~~ SC is maintained. For example, managing the internal corrosion of piping may rely on a mitigation programme (water chemistry) to minimize susceptibility to corrosion and a condition monitoring programme (ultrasonic inspection) to verify that the	Clarify that "intended function" and not "safety function"	X			

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		corrosion is insignificant.					
83	5.47	Appropriate acceptance criteria for inspection/ monitoring of ageing effects should be established for newly developed AMPs based on design basis/ requirements of the SC, relevant regulatory requirements and codes ~~&~~ and standards so that a corrective action ~~could~~ can be implemented sufficiently before loss of intended ~~functions~~ function(s) of the SC. Sufficient margin should be taken into account in these acceptance criteria.	Editorial comment for clarity.	X			
84	5.48	Particular attention should be paid in developing AMPs to assure that the programme ~~have~~ has provisions to detect, evaluate, mitigate or prevent ageing effects of anticipated degradation mechanisms, based on the findings from the AMR.	Editorial comment for clarity.	X			
85	5.49	Information on the current status of in-scope SCs should be collected for subsequent review of effectiveness of the AMPs. Performance indicators	Editorial comment for clarity.	X			

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		~~about~~ representing the effectiveness of AMPs should be developed along with development of AMPs (see 5.~~56~~ 55).					
86	5.50	Delete	5.50 is superfluous, with much the same meaning as 5.42.			X	The two points have slightly different accent: 5.42 indicates that SRS 82 provides examples of AMPs, and 5.50 – that reviewing existing and/ or developing new AMPs, - AMPs of SRS 82 are reference to assure consistency.
87	5.60	An in-depth review of ageing management should be performed periodically, for example as part of PSR [8] or as part of the safety review for LTO (see Section 7), in order to assess the ageing effects on reactor facility safety and to evaluate the effectiveness of plant programmes and practices used to support ~~the~~ ageing management ~~during the whole~~ throughout plant operation ~~of the plant~~, including LTO if applicable.	Editorial comment for clarity.	X			

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88	5.63	TLAAs should meet all six of the following criteria [~~SR IGALL~~5]: *Are contained or incorporated by reference in the CLB*. The CLB includes the technical specifications as well as design basis information, or plant commitments documented in the plant-specific documents contained or incorporated by reference in the CLB including, but not limited to: the FSAR, (or SAR), regulatory safety evaluation reports, the fire protection plan/hazards analyses, correspondence to and from the regulator, the quality assurance plan, and topical reports included as references ~~to~~ in the FSAR. If a code of record is in the FSAR for a particular ~~groups~~ group of SCs, reference material includes all calculations called for by that code of record, for those SCs.	Editorial comment for clarity.		FSAR replaced by SAR.		
89	5.66	A TLAA should meet one of the following criteria [~~IGALL~~	Editorial comment for clarity.	X			

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		~~SR5~~]: i. …; ii. *The analysis has been projected to the end of the intended period of operation.* ~~The analysis parameter~~ The value of the analysis parameter is changed based on the time-dependent parameter projected for the intended operating period, and the value of the analysis parameter continues to meet the regulatory limit or criterion; iii. *The ageing effects on the intended function(s) of the* ~~*structure or component*~~ *SC will be adequately managed…*					
90	6.1	Technological obsolescence of the SSCs in the plant should be managed through a dedicated plant programme with foresight and anticipation, and resolved before associated declines occur in reliability and availability ~~through a dedicated plant~~	Editorial comment for clarity.	X			

COMMENTS BY REVIEWER Reviewer: U.S. Nuclear Regulatory Commission/ NUSSC Country/Organization: United States of America Date: 6/09/2015				RESOLUTION			
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		~~programme~~.					
91	6.6	Technological obsolescence solution methods are illustrated in Fig. 7 and described in [5].	Add a reference to the new IGALL Technological Obsolescence Program (TOP101).	X			
92	7.1	The IAEA Safety Standards [2] in Requirement 16 provides requirements on ~~programme~~ programmes for LTO. ~~Detail~~ Detailed information on ~~programme~~ programmes for LTO ~~in~~ is provided in [5] and [21].	Editorial comment for clarity.		SSR 2/2 provides requirements on programme on LTO. SRS No. 82 provides AMPs and TLAAs but not programme for LTO.		
93	7.4	~~Beside~~ In addition to the existing obligations ~~in connection to~~ associated with ageing management, the operating organization should clearly define the additional responsibilities and authorities for LTO preparation and implementation. The operating organization should ensure	Editorial comment for clarity.	X			

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		that appropriate resources are available to ~~carry out their~~ accomplish the assigned responsibilities and accountabilities regarding LTO					
94	7.9	"LTO ~~concept~~ programme should address basic…" Also Fig. 8, should say "LTO application" instead of "LTO concept."	Clarification and consistency in wording			X	We are talking about LTO Concept – see Fig 8.
95	7.14	The approach to an LTO assessment is outlined in Fig. 8. ~~Overview~~ An overview of plant activities for LTO ~~and~~ should involve the following main steps: a) Demonstration that the ageing effects will continue to be identified and managed for each SC in the scope of LTO for the planned period of LTO (including the feedback of operating experience and ~~research~~ R&D findings); and b) Review of TLAAs to ensure that the analyses	Editorial comment for clarity.	X			

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		continue to meet the criteria of 5.~~61~~ 66.					
96	7.16	TLAAs should be re-evaluated for the LTO period and demonstrated to meet the criteria of 5.~~67~~ 66.	Editorial comment for clarity.	X			
97	7.17	The programme for LTO should include the following activities, evaluations, assessments, and results: a) …; b) Demonstration that the programmes credited for LTO support the conclusion that the ~~safety~~ intended functions of SSCs and the required safety margins will be maintained. This demonstration addresses the following topics: (i) A description of the intended functions of the SCs; (ii) Identification of applicable ageing effects and degradation mechanisms	Editorial comment for clarity.	X			

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		based on materials, environment, operating experience, etc.; (iii) Identification and description of operational programmes and ~~of~~ AMPs that manage the identified ageing effects ~~identified~~; (iv) Demonstration that the operational programmes and AMPs (including new programmes) are effective. c) Demonstration that the review performed for the SSCs within the scope of LTO is consistent with the process outlined in Section 5 and a technical justification is provided that: (i) Demonstrates that the ageing effects will be adequately managed for each SC in such a way that the intended function(s) of the SC will be maintained throughout the planned period of LTO in a manner that is					

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		consistent with the CLB; (ii) Ensures that operating experience and research findings are adequately reflected in assessing ageing effects of SCs in scope of LTO and will continue to be taken into account during the ~~whole~~ entire LTO period. d) Demonstration that the TLAAs have been revalidated and that the evaluation includes: (i) Identification of TLAAs in accordance with the definition specified ~~further~~ in ~~this section~~ 5.63; Revalidation of each identified TLAA in accordance with the revalidation requirements specified in ~~Section 5~~ 7.25 to demonstrate that the intended function(s) of the SC will be maintained throughout					

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		the planned period of LTO in a manner that is consistent with the CLB; e) The implementation programme for LTO identifying the corrective actions and/or safety improvements required for safe LTO, respective schedule and plant commitments.					
98	7.23	Based on the results of the AMR for LTO, the existing plant programmes used for ageing management and existing AMPs should be reviewed to ensure that they will remain effective to ~~managing~~ manage the effects identified for the planned period of LTO. This review should identify programme modifications and/or new programmes necessary to ensure that ~~SSCs~~ the SCs are able to perform their ~~designated safety function~~	Editorial comment for clarity.	X			

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		intended function(s) for the planned period of LTO.					
99	7.24	Any existing and new plant programme for LTO should be reviewed to determine whether they are consistent with the nine ~~elements~~ attributes described in Table 2.	In NUREG-1801, we use the term elements for the focal areas of an AMP. If the term attribute is used, it should be consistent.	X			
100	7.25	TLAAs should be reviewed to determine continued acceptability of the analyzed SC for the LTO period, consistent with 5.~~67~~ 65. In this case, the time-dependent parameter is determined from a re- evaluation or analysis of plant operating history, which is projected to the end of the LTO period, to define a value of the parameter that applies to, or bounds the expected value of the parameter at the end of the LTO period. The value of the time-dependent parameter applicable to the LTO period is used to re-evaluate the ~~analysis parameter~~ TLAA, consistent	Editorial comment for clarity.	X			

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		with the criteria of 5.~~67~~ 66.					
101	7.27	The documentation should provide detailed information on each element outlined in ~~para~~ 7.~~14~~ 17, and other information required by national regulatory requirements.	Editorial comment for clarity.	X			
102	7.37	To ensure safe LTO of a nuclear power plant, the operating organization should demonstrate, and the regulatory body should oversee, that the safety of the nuclear power plant will be maintained ~~through~~ throughout the ~~whole~~ LTO period against the current safety standards, consistent with national regulatory requirements.	Clarify that national regulatory requirements govern.	X			