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September 12, 2016

MEMORANDUM TO: Steven D. Bloom, Chief
Subsequent Renewal, Guidance,
and Operations Branch
Division of License Renewal
Office of Nuclear Reactor Regulation

FROM: William F. Burton, Sr. Project Manager */RA/*
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and Operations Branch
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SUBJECT: STAFF RESPONSES TO COMMENTS FROM PUBLIC MEETINGS ON
SUBSEQUENT LICENSE RENEWAL

The U.S. Nuclear Regulatory Commission (NRC) staff and interested stakeholders met on May 9, November 1, November 13, and November 14, 2012 to discuss issues for consideration for subsequent license renewal. The agendas and slide presentations are available in the NRC's Agencywide Documents Access and Management System (ADAMS) under Accession Nos. ML12135A610, ML12157A549, ML12158A545, ML12306A368, ML12313A235, and ML12319A528.

During and following these meetings, several comments were made for which the staff has provided responses. The responses are provided in Enclosures 1 - 3.

Enclosures:
As stated

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RESPONSES TO PUBLIC COMMENTS RELATED TO BACKFITS

Comment Number	Comment Text	Response
1	NRC properly revised its license renewal standards through a healthy, positive, reality-based approach to dealing with the issues, however, the decisions are not retroactive.	<p>Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) 50.109 (known as the Backfit Rule) governs the requirements for backfitting nuclear power plants. It requires that the Nuclear Regulatory Commission (NRC) justify each backfit with either a backfit analysis or a documented evaluation. The purpose of the Backfit Rule is to ensure that the NRC does not impose unnecessary regulatory burdens on licensees and ensures that backfit decisions and their justifications are well documented, transparent, and clearly understood.</p> <p>The term “backfit” denotes modification of or addition to (1) systems, structures, or components (SSCs), or design of a facility; organization required to design, construct, or operate a facility if the modification or addition results from a new or amended rule or from the imposition of a regulatory staff position interpreting the rules that is either new or different from a previously applicable staff position.</p> <p>The Backfit Rule ordinarily does not apply in the renewal of a nuclear power plant operating license under 10 CFR Part 54. However, if the NRC proposes to address safety issues outside the scope of Part 54, then any actions necessary to address such out-of-scope safety issues are subject to the Backfit Rule, with the exception of newly-identified SSCs under 10 CFR 54.37(b).</p> <p>On January 31, 2014, the staff provided SECY-14-0016 (ADAMS Accession number ML14050A306) to the Commission for consideration. This SECY included</p>

		<p>several recommendations for revising the regulatory framework in Part 54 to address operation of nuclear plants for 60-80 years (known as subsequent license renewal, or SLR). On August 29, 2014, the Commission issued its Staff Requirements Memorandum (SRM) for SECY-14-0016. In the SRM, the Commission did not approve the staff's recommendation to revise Part 54 for SLR and instead directed the staff to, among other things, continue to update license renewal guidance, as needed, to provide additional clarity on the implementation of the license renewal regulatory framework and address emerging technical issues and operating experience through means other than revising Part 54 (e.g., through updates to current guidance documents, through generic communications, and through voluntary industry initiatives).</p> <p>In making the updates to the current guidance documents, the staff is not addressing safety issues outside the scope of Part 54, and therefore the Backfit Rule does not apply. The proposed changes in the guidance documents are not retroactive. Rather they are focused on encouraging the use of enhanced tools, techniques, and methods to improve the management of aging effects of SSCs within the scope of Part 54 during the SLR period.</p> <p>The current backfitting process would continue in the SLR period. If a plant-specific backfit is identified, the requirements and processes of 10 CFR 50.109 would apply.</p>
2	What leverage does NRC have to compel plants to make changes retroactively when the licensing renewal process is updated? There is no legal obligation.	See response to Comment #1 above

3	<p>NRC does not consider when it relicenses plants, exemptions, waivers, and other grandfathering from regulations that have been adopted by the NRC over time to see if those exemptions, waivers, whatnot are still applicable to the plant being relicensed. Some of the examples we gave are the seismic criteria that were formally revised by the NRC in the mid-1990s to apply to new reactors in the Central and Eastern United States. Subsequent to that, the NRC relicensed the North Anna plants to the old seismic criteria.</p>	<p>In general, new regulations that are developed become part of licensee's current licensing basis (CLB), which is carried forward into the renewal period. Therefore, no currently operating plant goes into the period of extended operation without consideration of any new requirements that were developed during the initial operating period. Similarly, no plant will enter the SLR period without consideration of regulations invoked in the first period of extended operation.</p> <p>Nonetheless, in reviewing the current regulatory framework for license renewal, the staff considered new regulations that became effective, or current regulations that were revised, since Part 54 was last amended in 1995. For example, the staff reviewed 10 CFR 50.54(hh)(2) to protect structures, systems, and components from loss of large areas due to fires and explosions and 10 CFR Part 61a regarding alternative fracture toughness requirements to protect against Pressurized Thermal Shock.</p> <p>In addition, it's expected that any plant-specific exemptions or reliefs would be evaluated on a case-by-case basis.</p> <p>With regard to changes in seismic requirements stemming from the CEUS, this is being addressed through regular NRC processes and any changes to seismic requirements and criteria will be implemented in accordance with current NRC processes.</p>
4	<p>Not all relicensed plants need to meet all new standards, however, they should be reviewed against the standards to determine if grandfathering should apply.</p>	<p>See staff response to Comment #3 above</p>
5	<p>For reactors that underwent license renewal prior to the NRC revised guidance for license renewal, it is not clear how they are committed to the guidance change by other means.</p>	<p>Reactors that received renewed licenses to operate from 40-60 years and that wish to renew their licenses for 60-80 years of operation will most likely follow the guidance in the updated GALL and SRP when they prepare their applications but are not required to do so. Any applicant</p>

		has the option to address the requirements through other means. In such cases, the staff will review the information and make a safety determination. In the end, all licensees must demonstrate the ability to operate their plants safely during the SLR period.
6	Either the NRC violated 50.109 by requiring standards that were not necessary for safety on reactors that came later for license renewal or the NRC is not requiring reactors that came earlier in license renewal to do those things required for safety.	See staff response to Comment #1 above. As backfit analysis techniques and methodologies improve, the staff expects that they will be used in backfit determinations and analyses
7	You're cheating the people who live around the plants that were in the front of the line for license renewal because you have new information on how to better manage aging and you're not requiring these plants that came earlier to do these things.	See staff response to Comment #5 above
8	How could you know that there's a problem sufficient enough to change your guidance and do nothing about the plants you know don't have a legal requirement to meet the guidance?	See staff response to Comment #5 above
9	With regard to through-wall corrosion, when the guidance was changed to require both UT and visual inspection, did the NRC require reactors that have already gone through license renewal to do both?	See staff response to Comment #5 above

10	(With regard to backfit) ...Commissioner Apostolakis recognized that the tools that are used to do the cost-benefit analysis are so outdated and inadequate that you are never going to get it (identify the backfit) as cost-beneficial to be done and therefore it is a waste of time to perform the cost-benefit analysis.	See staff response to Comment #6 above
11	There is nothing definitive now that requires reactors that came earlier in the license renewal process to implement guidance changes that occurred after their license was renewed.	See staff response to Comment #5 above
12	You've already identified what is needed for plants that came late in license renewal and those that came early are not getting that. It's not fair to the American public.	See staff response to Comment #5 above
13	The earlier plants are older, so they're probably more susceptible.	See staff response to Comment #5 above
14	So does that mean if I'm the first plant relicensed and you can't make the 50.109 argument for revision 2 and you come in and find that I don't meet [revision 2] -- I'm going to say that -- you basically told me I don't have to meet this requirement because you can't apply it to me?	Applying for SLR is voluntary – licensees can choose not to operate their plants for 60-80 years. However, if they decide to operate for this period, all requirements must continue to be met to ensure safety. The GALL and SRP are guidance documents and therefore applicants are not required to adhere to them. Any applicant has the option to address the requirements through other means. In such cases, the staff will review the information and make a safety determination. In the end, all licensees must demonstrate the ability to operate their plants safely during the SLR period.

**RESPONSES TO PUBLIC COMMENTS RELATED TO
OPERATING EXPERIENCE/AGING MANAGEMENT
PROGRAMS**

Comment Number	Comment Text	Response
1	<p>The NRC and industry efforts to continually improve aging management programs should continue. Lessons learned and operating experience should be incorporated into the subsequent license renewal process. This will result in revisions to industry guidance documents, such as NEI 95-10, as well as regulatory guidance documents, such as the Standard Review Plan and the GALL Report. We as the industry look forward to working collaboratively with the NRC and the other stakeholders.</p>	<p>The staff agrees that lessons learned from operating experience and research findings should be used to inform updates to the GALL and SRP to ensure that aging management programs and time-limited aging analyses provide guidance to ensure that aging of structures and components within the scope of license renewal will be adequately managed during the subsequent period of extended operation. Input from all stakeholders is encouraged throughout the staff's review of the GALL and SRP.</p>
2	<p>Most reactors haven't yet reached 40 years. Tritium is leaking into ground water, cooling towers have collapsed and you're about to relicense Davis-Besse which proves you do not have an adequate handle on aging. You lose public confidence when you have a football-size hole in the vessel head of a nuclear reactor and then say that FirstEnergy has a process that will manage aging.</p>	<p>Industry operating experience, such as that from Vermont Yankee and Davis Besse, is considered in the staff's update of the GALL and the SRP, but the GALL and SRP are not requirements, only guidance, and as such, applicants for license renewal are not required to follow the guidance. However, applicants for license renewal must meet NRC requirements. The GALL and SRP contain staff-approved processes, methodologies, and tools that, if followed, ensure compliance with NRC requirements and therefore provide reasonable assurance of safe plant operation. If applicants choose processes, methodologies, or tools that are different from those approved in the GALL and SRP, the staff will review these alternatives to determine if they provide aging management at least equivalent to what would be expected from following guidance in the GALL and SRP.</p>

		<p>In addition to operating experience, the staff reviews lessons learned from past license renewal reviews to identify areas where additional focus can produce more effective and efficient outcomes for future reviews. The staff also reviews or sponsors research to identify areas where new aging mechanisms or effects may be revealed in the subsequent period of extended operation and how those effects can be identified and managed to prevent loss of function of structures, systems, and components.</p>
3	<p>(With regard to aging and corrosion)... you have experience looking backwards, but you don't have experience looking forward because reactors haven't operated for 60 years.</p>	<p>Industry operating experience is considered in the staff's update of the GALL and the SRP.</p> <p>In addition to operating experience, the staff reviews lessons learned from past license renewal reviews to identify areas where additional focus can produce more effective and efficient outcomes for future reviews.</p> <p>The staff also reviews or sponsors research to identify areas where new aging mechanisms or effects may be revealed in the subsequent period of extended operation and how those effects can be identified and managed to prevent loss of function of structures and components.</p>
4	<p>The materials and environments in other plants and large facilities are applicable to nuclear facilities for aging management.</p>	<p>Although there is much information on aging effects resulting from material and environment combinations similar to those found at nuclear power plants, there is sufficient information from the operation of nuclear plants to reasonably assess aging impacts without extensive input from non-nuclear facilities. However, the staff will consider such information if it can be useful in managing aging in nuclear plants.</p>
5	<p>Radiation is being tested (in context of aging management programs) through research and development at accelerated rates to predict, and be proactive in, identifying effects that may show</p>	<p>As part of its review of the GALL and SRP, the staff reviews or sponsors research to identify areas where new aging mechanisms or effects may be revealed in the subsequent period of</p>

	up later. This is also part of the inspection programs.	extended operation and how those effects can be identified and managed to prevent loss of function of structures and components. For example, the impact of radiation exposure on structures and structural components, irradiation-assisted stress corrosion cracking on reactor internals and primary system components, and reactor pressure vessel embrittlement at high fluence levels were identified as issues to be addressed for SLR.
6	(With regard to aging, corrosion, and the effects of radiation) You do not have the data looking forward.	See staff response to Comment #4 above.
7	Power uprates have nothing to do with safety. You boosted the power on 40-year old reactors shaking them to shutdown. You collapsed cooling towers, and then turned around and relicensed the reactors. Really, way to instill public confidence.	With regard to power uprates, current NRC regulations and guidance are used to assess whether a plants rated power can be increased. The plant's licensing basis will reflect the new higher power. The revised licensing basis approved by the NRC would then carry forward into the license renewal period.
8	Under the original rule when originally relicensing reactors, there was an NRC document that showed the embrittlement of reactor vessels. And I know you've reconfigured cores and tried to reduce embrittlement, but you've been pencil-whipping those calculations for years, and opening wider and wider gaps in your safety net.	<p>The NRC has a number of regulations in Part 50 of Title 10, <i>Code of Federal Regulations</i> (10 CFR Part 50) to address potential reductions in the fracture toughness properties of the reactor pressure vessels (RPVs) in boiling water reactors (BWRs) and pressurized water reactors (PWRs). 10 CFR Part 50, Appendix G, requires licensees to use upper shelf energy (USE) analyses to demonstrate that RPVs will have adequate ductile properties throughout the life of the plant (including anticipated periods of extended operation). For PWRs, licensees are required by 10 CFR 50.61 (or the alternative regulation in 10 CFR 50.61a) to demonstrate that RPVs are adequately protected against the consequences of pressurized thermal shock (PTS) events throughout the life of the plant (including anticipated periods of extended operation).</p> <p>Licensees that cannot demonstrate that their RPVs will meet the</p>

		<p>acceptance criteria in the applicable regulations are required to submit corrective action proposals to the NRC for approval well in advance of exceeding those acceptance criteria levels. However, the regulations permit licensees to decide on the type of corrective action that will be used if they cannot meet the applicable acceptance criteria for the required analyses. Plant shutdowns or core flux reduction modifications are two options that may be used to address such issues. However, the regulations also allow the licensees to demonstrate the acceptability of their RPVs through reanalysis. For example, licensed U.S. owners of BWRs and PWRs that cannot meet the acceptance criteria in 10 CFR Part 50, Appendix G, for USE analyses are required to reanalyze their RPVs using equivalent margins analyses and have those analyses approved by the NRC. Similarly, licensed owners of PWRs that cannot meet the acceptance criteria in 10 CFR 50.61 for PTS analyses are permitted to reanalyze their RPVs in accordance with the alternative PTS analysis methodology in 10 CFR 50.61a. Other alternative methods of reanalysis may be used if the alternative methods are proposed as an applicable exemption to the analysis requirements in the applicable regulation and are approved by the NRC in accordance with the regulatory exemption requirements in 10 CFR 50.12.</p> <p>Reanalysis methodologies must employ known engineering principles that are demonstrated as being acceptable to the NRC. Such alternative analysis methods would need to include appropriate safety margins that are found to be acceptable to the NRC. Thus, the requirements in 10 CFR Part 50 do not preclude a licensee from reanalyzing their RPVs when they cannot demonstrate acceptability of their</p>
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		<p>RPVs in accordance with the applicable regulatory requirements for analyzing the RPVs. However, if reanalysis is used as the option for taking appropriate corrective action, the reanalysis must be submitted to the NRC and approved by the NRC well in advance of exceeding the acceptance criteria in the applicable regulation.</p>
9	<p>I think we should compound operating experience centrally, and we should compare predicted versus actual for AMPs.</p>	<p>Both the NRC and the nuclear industry collect operating experience from all nuclear power plants. The NRC routinely reviews the data to identify, among other things, plant-specific and industry-wide trends. Important findings and observations are shared with the industry and, when appropriate, regulatory actions are taken (e.g., issuance of generic communications). This process will continue during the subsequent period of extend operation.</p> <p>In addition, for applications for license renewal, information on plant-specific and industry-wide operating experience is included in Element 10 of the applicable AMPs. In its review of license renewal applications, the staff uses this information to determine whether aging was a factor in the operating experience, whether the AMP is adequate to effectively manage the aging effect, or if revisions have been, or need to be made, to the AMP to manage the aging more effectively.</p>
10	<p>So often, what's on the as-is drawings is not actually what's in the reactor. So, even before you start to look at AMPs, step one is to verify the configuration. Step two, figure out what you've got there. ... when you've got a reactor that's been subject to corrosion, it's been subject to embrittlement, these things are variable under space and under time, so you've got to look at very carefully the spatial and temporal variability.</p>	<p>The two fundamental principles underlying the NRC's License Renewal Program is that (1) current NRC processes are adequate to ensure that the licensing bases of all currently operating plants are maintained at an acceptable level of safety and (2) each plant's licensing basis must be maintained during the renewal term.</p> <p>Through inspections and other means, the NRC continuously monitors changes to a plant's current licensing basis and this will continue during the subsequent period of extended</p>

		<p>operation. With these processes in place, age-related degradation is the additional focus for the NRC in the subsequent period of extended operation to ensure continued plant safety. This focus is reflected in the AMPs that licensees implement in the subsequent period of extended operation. Some aging effects occur over time due to corrosion, erosion, etc. The AMPs monitor the affected structures and components to ensure that the aging effects are addressed and the intended functions of the structures and components are maintained. Other aging effects are temporal in that they occur based on time-dependent factors. For example, the number of thermal and pressure transients on a component may be monitored to determine the fatigue on the component, or monitoring of prestress forces on concrete containment tendons, which lose their prestressing force over time due to creep, concrete shrinkage, or relaxation of the prestressing steel. In all cases, spatial and temporal changes to structures and components are monitored to ensure that structure and component functions are maintained in the subsequent period of extended operation.</p>
11	<p>You need to define your margins, what margins you want and what uncertainty in those margins you are prepared to tolerate. You've then go[t] to define past aging rate of increase in fatigue and predict the uncertainty in that aging rate. ... I'm recommending at least 95 percent certainty that margins are being maintained. Unfortunately, the Commission is happy with 50 percent certainty the margin is being maintained.</p>	<p>Through its ongoing licensing, oversight, and enforcement activities, the NRC ensures that licensees maintain adequate margins of safety throughout the life of the plant. If information from inspections and analyses show that the established safety margins are eroding, the NRC requires licensees to determine the safety impact and how margins will be maintained or restored. If it's determined that safety cannot be maintained, the NRC will require that the plant be shut down.</p> <p>In addition, as part of the NRCs ongoing processes, uncertainties and sensitivities are routinely considered in</p>

		<p>safety analyses. More recently, the Commission has asked the staff to be more transparent in consideration of these factors in risk analyses.</p> <p>For the subsequent period of extended operation, some AMPs have been revised to account for uncertainties in operating the plants beyond 60 years. These revisions may include more frequent inspections, increased sampling frequencies, larger sample sizes, or bounding analyses</p>
12	<p>Monitoring should be done more often or over larger areas to reduce uncertainty. There's a tremendous failure to evaluate uncertainty explicitly. Once you do so, you'll see there is a massive amount of error that we need to manage, and we need to take account of variability.</p>	<p>See staff response to Comment #11 above</p>
13	<p>Aging management programs lack any specificity in their requirements. No one knows what "reasonable assurance and preponderance of the evidence standard" means. These programs need more clarification, something like a percent inspected, to be measureable.</p>	<p>NRC's "reasonable assurance" standard has been consistently applied for many years and has proven to be effective at ensuring safety at nuclear power plants. This standard will continue throughout the subsequent period of extended operation. Lessons learned from operation of current plants, along with ongoing research into the mechanisms and effects of aging, will continue to be used to update aging management programs.</p> <p>In addition, several AMPs have been revised to provide more specificity in the types and extent of inspections to be done during the subsequent period of extended operation.</p>
14	<p>You can't make a good decision by looking back. Retired reactors should be dissected and studied to gain more information on the current state of the systems.</p>	<p>The NRC utilizes information from decommissioned reactors to identify aging effects or to confirm the extent of aging expected in reactor systems. Ex-plant materials are valuable because they have been exposed to actual in-service plant operating conditions (temperature, irradiation, coolant, etc.), unlike virgin materials tested under simulated conditions in the lab. Testing ex-plant materials will provide fundamental knowledge and useful data on materials degradation of</p>

		<p>reactor components, concrete structures, and cables to support anticipated future NRC needs. NRC has separate as well as collaborative research activities aimed at gaining a better understanding of aging effects on materials performance. As part of these activities, ex-plant materials from decommissioned plants in U.S., such as Zion (cables), Crystal River (cables), and in Spain, Zorita (vessel internals and concrete), are being used. More information on these activities can be found in NUREG-1925, Revision 3, "Research Activities FY 2015-FY 2017 (March 2016).</p> <p>In addition, the revised GALL for SLR will include the withdrawal and testing of an additional surveillance capsule with a neutron fluence exposure of 1-2 times the 80-year projected neutron fluence value.</p>
15	How are you going to replace obsolete components in reactors that are 60+ years old? How are you going to find qualified replacement components?	<p>Non-safety related SSCs that could potentially impact a safety-related SSC's ability to perform its intended functions are included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). If a system within the scope of license renewal was "aged" through obsolescence such that it was determined that the system no longer has the ability to perform its intended function, it would require replacement in accordance with the plant's current licensing basis. Further, if an applicant proposed an aging management program but could not demonstrate that certain components could not be repaired or replaced to address age-related degradation, the applicant would not be able to demonstrate that the effects of aging will be adequately managed so that the intended function will be maintained, as required by 10 CFR 54.21(a)(3), and would therefore not meet the regulatory requirements for a renewed license.</p>

16	<p>We have talked about an analysis of operating experience into the period of extended operation. I wonder two things. One is, how is predicted actually done in practice? And will we see public documents on that?</p>	<p>Collection, review, and analysis of plant operating experience is performed by both licensees and NRC staff on an ongoing basis, continues into the first license renewal period, and will continue into the subsequent license renewal period. Information developed through the Operating Experience Program is used in a number of ways, including determining whether identified aging effects are consistent with what was expected. Significant differences between what was seen and what was expected are evaluated and changes that may be needed to the aging management programs are made. These changes may be documented and shared in the short term through Interim Staff Guidance and finalized in the guidance documents during the next update.</p>
17	<p>I'm talking about AMP programs. For license renewal, for the programs that you approve as effective on the license renewal, what I'm suggesting is that there should be a guideline. The program should be adequate to ensure 95 percent certainty of compliance with that aspect of the CLB. As far as I know, there's no guidance out there at all at the moment on the degree of certainty required. See, I don't understand how you would design a program, an aging management program, if you don't know the degree of certainty to which it should ensure compliance. How do you figure out what the spatial scope should be? And how do you figure out what the temporal repeat period -- it goes back to Dave's (previous speaker) one-time inspection thing. If you don't know what certainty of compliance you are aiming for, I don't think you can derive a frequency or a spatial scope.</p>	<p>See staff response to Comment #11 above</p>

<p>18</p>	<p>The problems with cables are the insulation, how they are installed and where they are installed. 23 years worth of research has been done on cables and at least two techniques have been developed to monitor cable performance. The guidelines for cable are available.</p> <p>Several plants have already performed their first set of walk-downs on cable, and some have done their second.</p>	<p>The staff has identified electrical cable qualification and condition assessment as a significant focus area for subsequent license renewal. Several aging management programs will be revised to identify ways to better manage degradation of electrical and I&C cables.</p>
<p>19</p>	<p>In the hearing in front of the joint legislature committee April 6, 2011, Entergy admitted, contrary to their previous testimony, that there were no tests by which you could determine the degradation of the buried electric cables.</p> <p>So question number one, is there something different in the past year? Do you have the capability of determining?</p>	<p>See staff response to Comment #18 above</p>
<p>20</p>	<p>And, question number two, what about low-voltage cables?</p>	<p>Low voltage (below 400 V) cables are covered under GALL Report aging management programs (AMPs) XI.E1 and XI.E2 (sensitive, high voltage, low-level current instrumentation signals), as well as the proposed SLR AMP XI.E3 (e.g., inaccessible cables installed in direct buried, buried conduit, duct bank, embossed, vaults or manholes).</p>
<p>21</p>	<p>Are there testing techniques that can be used to tell the condition of cables with regard to degradation due to corrosion and in particular from moisture?</p>	<p>There are a number of tests described in various documents such as NUREG 7000, IEEE 1205-2000, and Regulatory Guide 1.218, EPRI technical reports as well as tests mentioned in the GALL Report</p>
<p>22</p>	<p>What time frame is proposed for periodic tests for monitoring the cable systems?</p>	<p>GALL Report aging management program (AMP) XI.E1 is visual inspections with testing as warranted by inspections. AMP XI.E2 recommends at least a 10-year test frequency for cables that are not tested as part of system maintenance or surveillance. AMP XI.E3 recommends</p>

		at least a 6-year test frequency for medium voltage power cables and visual inspection and testing as warranted for instrumentation, control and low voltage power cables subjected to wetting, etc
23	Will the guidelines for cable inspections be transferred to the aging management programs and be retroactive for reactors that have already been licensed?	Appropriate electrical GALL AMPs have cable inspection guidelines for license renewal. Guidelines do not apply retroactively but the evaluation of operating experience is part of the AMPs such that an AMP may be modified based on plant specific or industry operating experience.
24	Will the guidelines for cables be turned into requirements?	No
25	The commenter stated the question, "(is this) self-regulation?" in response to a discussion on the maintenance rule-type action where the plant does an effectiveness review of their aging management and the NRC comes in and only reviews that.	<p>For the subsequent period of extended operation, licensees must have processes in place to review their aging management programs to ensure that they continue to effectively manage aging.</p> <p>If licensees determine that AMPs need to be revised, it will be done through the Appendix B process.</p> <p>The Nuclear energy Institute has developed NEI 14-12, "Aging Management Program Effectiveness," to provide a standard approach for the self-assessment process for periodically evaluating the effectiveness of aging management programs to ensure on-going program effectiveness and to provide documentation of information useful for subsequent license renewal applications.</p>
26	(With regard to an effectiveness review of the aging management program done by the licensee with this review being inspectable by the NRC) ...the review depends upon the inspection by the licensee and the licensee, particularly in the case of merging plants, does not have a motive to spend the money.	The Nuclear energy Institute has developed NEI 14-12, "Aging Management Program Effectiveness," to provide a standard approach for the self-assessment process for periodically evaluating the effectiveness of aging management programs to ensure on-going program effectiveness and to provide documentation of information useful for

		<p>subsequent licensee renewal applications.</p> <p>These processes will be incorporated into site programs as part of the licensees licensing basis and as such, will be subject to inspection by the NRC.</p>
27	<p>If you haven't had any failures and you're not doing the inspections that are done at plants that were late in the license renewal queue you won't have any data and you are not finding problems that are there and getting worse.</p>	<p>Licensees review both plant-specific and industry-wide operating experience to determine if such experience could be applicable to their plants. This operating experience is generally disseminated through generic communications issued by the NRC or through reports issued by the Institute of Nuclear Power Operations (INPO). Through these processes, licensees evaluate all operating experience for applicability to their plants.</p>
28	<p>The industry's attempt to review operating experience hasn't picked up deviations such as the Oyster Creek tritium leak totally unpredicted by aging management programs and corrosion in containment, again where the aging management programs had predicted no corrosion. I'm sure there are a lot more. But if you haven't picked those up in your review, there is something wrong with your review.</p>	<p>The examples highlighted in the question were documented and shared with other plant operators, evaluated through their Appendix B programs, and any revisions to AMPs that may be needed to ensure aging were made. In addition, the Nuclear energy Institute has developed NEI 14-12, "Aging Management Program Effectiveness," to provide a standard approach for the self-assessment process for periodically evaluating the effectiveness of aging management programs to ensure on-going program effectiveness and to provide documentation of information useful for subsequent licensee renewal applications.</p> <p>These processes will be incorporated into site programs as part of the licensees licensing basis and as such, will be subject to inspection by the NRC</p>
29	<p>... I hope the operating experience you are looking at is cross-plant. I noticed that there's a tendency to look plant by plant.</p>	<p>See staff response to Comment #28 above</p>
30	<p>The NRC does a lot of industry trends programs and has a lot of indicators that it tracks, safety</p>	<p>Both the NRC and the industry have program and processes in place to</p>

	<p>system failures, and so on. Are those being culled out to identify those that may have an aging-related component when it's passive failure or an active component to see if trends are going in different directions to back up or supplement the questions you are already asking yourself?</p>	<p>quickly identify whether plant events were wholly or partly due to inadequate aging management.</p>
31	<p>With regard to trend codes and information related to operating history such as failures that may relate to an aging issue, having a database or the information would better inform decisions about where to apply resources and related issues. It would be helpful to develop the database or information more fully to complement the industry trend program and other data collection.</p>	<p>See staff response to Comment #16 above.</p>
32	<p>We would like to believe that the agency would take appropriate steps (or corrective action) to address an aging issue when it found it whether it involves the current license, a renewed license, or an extended renewed license, but that is not the case.</p>	<p>Regardless of whether a plant is in its initial licensing period, or in a period of extended operation, if age-related issues are identified, they are addressed through the licensee's Appendix B program.</p>
33	<p>... I know for a fact that there are all kinds of things that happen in licensing that do not meet the cable separation criteria. Is it possible to actually separate cable as you are replacing it?</p>	<p>NRC regulations (10 CFR 50.55) require licensees to comply with various industry codes and standards including IEEE Std. 279 and IEEE Std. 603, which in turn reference IEEE Std. 384, (endorsed by Regulatory Guide 1.75, "Criteria for Independence of Electrical Safety Systems") for establishing and maintaining the independence of safety related equipment, including safety related cables, by physical separation and electrical isolation. There are other regulatory requirements such as 10 CFR 50 Appendix A (General Design Criteria, GDC 17, GDC 21 and GDC 22) which also address; cable separation, independence of safety related cables, and electrical isolation of protection systems. Deterministic electrical cable separation criteria for fire protection is regulated by 10 CFR 50.48(b), Appendix R of 10 CFR 50, and Regulatory Guide 1.189.</p> <p>Non-conforming conditions at nuclear power stations are regulated by 10 CFR 50 Appendix B, quality assurance program and the corresponding</p>

		<p>corrective actions elements. Cable replacements and new construction activities or modifications are similarly governed under regulations and standards to ensure proper cable separation practices.</p> <p>With regard to the question as to whether it is feasible for a licensee to separate electrical cables that do not meet regulatory requirements or guidance, with appropriate planning it is feasible to meet requirements by rerouting the cables. In addition to cable rerouting, cable protection (e.g., installation of barriers) or incorporating other alternatives may also be found acceptable in meeting regulatory requirements.</p>
34	How the issue of obsolescence (e.g. availability of electronic spare parts) will be considered in subsequent license renewal?	See staff response to Comment #15 above.
35	How the issue of maintaining skills (utility, vendor, regulator...) will be taken into account in subsequent license renewal?	This issue will continue to be addressed in the subsequent period of extended operation as it has been in the initial operating period and the first license renewal period.
36	There needs to be adequate time for energy planners to evaluate alternatives for replacement energy if needed. The 20-year term allows this sufficient time. Current regulations also require licensees to submit decommissioning plans on or about 5 years prior to the expiration of the operating license. If the renewal window were 10 years, for example, the effective submittal and review time would only be 5 years until a decommissioning decision needs to be acted upon by the utility. This small window is inadequate for planning and likely result in unnecessary plant shut-downs due to the uncertainty, therefore Exelon's comment is yes to the question to keep 20-year window for submittal.	The 20-year window will be maintained for the submittal of applications for subsequent license renewal.

RESPONSES TO PUBLIC COMMENTS FROM THE UNION OF CONCERNED SCIENTISTS

Comment Number	Comment	Response
1	NRC simply must abide by 10 CFR 50.100 and 10 CFR 50.109 by having ALL reactors conform with ALL safety requirements – not just reactors late in the license renewal queue.	Reactors that received renewed licenses to operate from 40-60 years and that wish to renew their licenses for 60-80 years of operation will most likely follow the guidance in the updated GALL and SRP when they prepare their applications but are not required to do so. Any applicant has the option to address the requirements through other means. In such cases, the staff will review the information and make a safety determination. In the end, all licensees must meet NRC regulations and demonstrate the ability to operate their plants safely during the SLR period.
2	The license renewal process should formally evaluate all regulatory decisions where an operating reactor was grandfathered, waived, exempted, or otherwise not required to meet new and revised regulatory requirements to either confirm that such decisions remain justified for the extended license period or make appropriate fixes.	<p>In general, new regulations that are developed become part of licensee's current licensing basis (CLB), which is carried forward into the renewal period. Therefore, no currently operating plant goes into the period of extended operation without consideration of any new requirements that were developed during the initial operating period. Similarly, no plant will enter the SLR period without consideration of regulations invoked in the first period of extended operation.</p> <p>Nonetheless, in reviewing the current regulatory framework for license renewal, the staff considered new regulations that became effective, or current regulations that were revised, since Part 54 was last amended in 1995. For example, the staff reviewed 10 CFR 50.54(hh)(2) to protect structures, systems, and components from loss of large areas due to fires and explosions and 10 CFR Part 61a</p>

		<p>regarding alternative fracture toughness requirements to protect against Pressurized Thermal Shock.</p> <p>In addition, it's expected that any plant-specific exemptions or reliefs would be evaluated on a case-by-case basis.</p>
3	<p>NRC must not undervalue human lives when performing and accepting cost benefit analyses.</p>	<p>The NRC agrees with this comment that the value of human lives should not be undervalued when performing and accepting cost-benefit analyses and is in the process of updating the value used in making this determination. To estimate the value of the benefits of a proposed regulation, the NRC uses a tool called the value of statistical life (VSL) to estimate the benefits of a proposed safety change (e.g., measuring the value of reducing already small risks of premature death), which is also used to estimate benefits of not being exposed to radiation.</p> <p>The NRC has taken a big step in revising how we weigh the costs and benefits of proposed changes to safety requirements. We've issued a draft update to one of our cost-benefit analysis guidelines, "Reassessment of NRC's Dollar per Person-Rem Conversion Factor Policy." In this update, the NRC staff concludes that a VSL of \$9 million is appropriate. This compares to the \$3 million VSL the NRC started using in 1995. Additional information is available about the staff's work in updating these estimates by going to regulations.gov and searching for Docket ID NRC-2015-0063.</p>
4	<p>NRC must either require safety upgrades deemed to be cost beneficial to be implemented or have its story ready following a nuclear plant disaster that could have been prevented or mitigated by the identified safety upgrade that was not implemented (i.e, be prepared to explain why a sea wall known to too short was not heightened until after the disaster).</p>	<p>The requirements of the 10 CFR 50.109 (the Backfit Rule) continue to apply for SLR. In addition,</p>
5	<p>While licensees must retain the ability to revise commitments for appropriate reasons, the</p>	<p>The staff is assessing the role of regulatory commitments, FSAR implementing requirements and license</p>

	NRC's license renewal process simply cannot allow licensees to renege on their commitments and revert to practices considered inadequate by the NRC staff.	conditions, and determining how each will be applied to support license renewal application reviews.
6	The license renewal process should formally evaluate all the issues in FSAR Chapter 2 to either confirm that safety and environmental conclusions are still applicable or make appropriate fixes.	One of the principles of the License Renewal Rule is that current regulatory processes are sufficient to ensure that the CLB for a nuclear power plant will be maintained in the same manner and to the same extent for the extended operating period as it was for the prior operating period. As such, any Commission decision to generically address man-made external hazards differently from the current practice (of considering man-made hazards on a plant-specific basis) will be done through rulemaking and will then become part of a plant's revised licensing bases. Whether man-made external hazards are addressed generically through rulemaking, or addressed on a plant-specific basis, once the licensing basis is revised to address man-made external hazards, the new CLB will carry forward into the extended period of operation. On this basis, the staff concluded that using subsequent license renewal as an opportunity to require applicants for operation beyond 60 years to reevaluate nearby external hazards near their plants is not appropriate.
7	The license renewal process must either justify results from one-time inspections remaining valid over time or replace them with two-timing or three-time inspections.	The staff has reevaluated the validity of one-time inspections for SLR. In many cases, original one-time inspections will be performed again before entering the SLR period
8	NRC must use license renewals as opportunities to catch and correct safety oversights rather than to sustain continued overlooks. When safety frameworks change, as they have with respect to onsite residency periods for spent fuel, the license renewal process must formally determine whether the status quo still provides adequate protection.	The Staff agrees. See staff response to Comments #1 and #2
9	The NRC's license renewal process must provide equal protection of the	One of the basic tenets undergirding the License Renewal Program is that nuclear plants' licensing basis will be

	environment as its initial licensing process.	maintained in the same manner and to the same extent in extended periods of operation as they were during the initial licensing period. With regard to environmental considerations, applications for renewed licenses will continue to be evaluated to determine if there is any new or significant information that should be considered for the extended period of plant operation.
10	The formal evaluation of options to renewing the operating license of an aging nuclear reactor should also consider building and operating a new nuclear reactor instead.	The staff routinely considers alternative energy sources as part of its environmental review. Viable energy alternatives, which are generally considered by staff include solar, wind, natural gas, and a new nuclear plant option.