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NUCLEAR ENERGY INSTITUTE

August 21, 2015

Ms. Cindy K. Bladey  
Office of Administration  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

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**Subject:** NEI Comments on NUREG-1927, Revision 1, "Standard Review Plan for Renewal of Specific Licenses and Certificates of Compliance for Dry Storage of Spent Nuclear Fuel," 80FR38780 (Docket ID NRC-2015-0106)

**Project Number: 689**

Dear Ms. Bladey:

On behalf of the nuclear energy industry, the Nuclear Energy Institute (NEI)<sup>1</sup> appreciates the opportunity to provide comments on the proposed draft NUREG-1927, Revision 1, "Standard Review Plan for Renewal of Specific Licenses and Certificates of Compliance for Dry Storage of Spent Nuclear Fuel." NEI commends the NRC's Division of Spent Fuel Management for its efforts to provide improved regulatory guidance for dry cask storage license renewal. These efforts have included significant public dialogue and stakeholder outreach in which the industry has participated. As a result, NEI is developing companion guidance for the industry in the form of NEI 14-03, *Format, Content, and Implementation Guidance for Dry Cask Storage Operations-Based Aging Management*. We believe that the combination of effective guidance for the preparers of dry storage license renewal applications (NEI 14-03) and equally effective and consistent guidance for the reviewers of these applications (NUREG-1927, Revision 1) will form the basis for a stable and predictable regulatory framework in which the learning aging management programs necessary to support long-term dry cask storage can be effectively implemented.

The concept of learning aging management is of fundamental importance in dry storage license renewal. This is because potential aging effects associated with long-term dry storage have yet to be observed at in-service

<sup>1</sup> The Nuclear Energy Institute (NEI) is the organization responsible for establishing unified industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all entities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel cycle facilities, nuclear materials licensees, and other organizations and entities involved in the nuclear energy industry.

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**Template = ADM - 013**

**E-RIDS= ADM-03**

**Add=** K.L. Mantua (KLB)  
R. Torres (rat3)

storage systems and our ability to assure the effective management of such effects, if and when they do occur, will depend on the thorough collection, sharing and evaluation of future operating experience. For this reason, the implementation of lessons learned from future operating experience, through the application of "tollgate" assessments, is the centerpiece of NEI 14-03. We greatly appreciate that the NRC has also incorporated this concept in NUREG-1927, Revision 1.

The industry has received NRC feedback on draft versions of NEI 14-03<sup>2</sup> and will be re-submitting this document to the NRC by no later than the end of September 2015. We request that the final NUREG-1927, Revision 1, endorse NEI 14-03, to the maximum extent possible, to assure consistency between dry storage renewal application preparer and reviewer expectations. We also understand that the NRC is preparing a more detailed guidance document on Aging Management Programs (AMPS). The NRC has indicated<sup>3</sup> that this document, referred to as the Managing Aging Processes for Storage (MAPS) report, is intended to serve a similar function for dry cask storage license renewal that the Generic Aging Lessons Learned (GALL) report serves for reactor license renewal. The MAPS report will also be an important component of a stable and predictable regulatory framework. We look forward to continuing to working with the NRC to resolve any remaining issues necessary so that these three documents can put into effect at the same time.

The industry comments on draft NUREG-1927, Revision 1, offered in the attachments to this letter are offered in the spirit of achieving a consistently understood approach to learning aging management. The comments in Attachment 1 address three fundamental principles that we believe should be more clearly articulated in NUREG 1927, Revision 1. The comments in Attachment 2 address specific detailed changes to the draft NUREG consistent with these principles.

We are confident that the comprehensive regulatory guidance envisioned by applying NEI 14-03, in conjunction with a revised NUREG-1927 and the MAPS report, will form a valuable framework for assuring that the established safety record of dry cask storage in the United States can continue to be maintained throughout renewed operating periods. That safety record is reflective of the robust designs employed for dry cask storage and an effective regulatory regime—with strenuous design review and appropriate inspection oversight of licensee and Certificate of Compliance (CoC) holder programs and procedures to monitor, detect, mitigate and/or repair any operational issues or aging effects prior to any loss of safety function. At present, approximately 2,200 dry storage systems are safely storing spent nuclear fuel, with the longest in-service time approaching three decades, with no loss of confinement integrity and no impact on the public health and safety.

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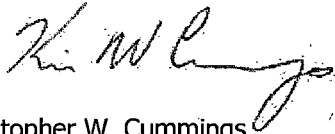
<sup>2</sup> Response to September 23, 2014, Nuclear Energy Institute Submittal: NEI 14-03, *Guidance for Operations-Based Aging Management for Dry Cask Storage*, Revision 0 (ML15013A201).

<sup>3</sup> April 8, 2015, ACRS Meeting Transcript (ML15133A463).

Ms. Cindy K. Bladey  
August 21, 2015  
Page 3

We look forward to continuing to work with NRC staff to further coordinate these important guidance documents. Please do not hesitate to contact me at any time with questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kristopher W. Cummings', with a stylized flourish at the end.

Kristopher W. Cummings

Attachments

c: Ms. Catherine Haney, NMSS, NRC  
Mr. Mark Lombard, NMSS/DSFM, NRC  
Mr. Anthony Hsia, NMSS/DSFM, NRC  
Mr. Aladar Csontos, NMSS/DSFM/RMB, NRC  
Ms. Kristina Banovac, NMSS/DSFM/RMB, NRC  
Mr. John Wise, NMSS/DSFM/RMB, NRC

## **Fundamental Principles for Incorporation into NUREG-1927, Revision 1**

### **Principle #1: Aging management inspection protocols that are both robust and reasonable**

**Comment:** Throughout the guidance document, and especially in Appendix C the terminology "lead system inspection", "baseline inspection" and inspections associated with aging management programs are identified. The purpose of inspections associated with example aging management programs (AMPs) is clearly articulated with defined acceptance criteria contained in Appendix B. However, additional clarification on the purpose, scope and acceptance criteria for the lead system inspections and the base line inspections (i.e., those inspection proposed to occur prior to the period of extended operation) is needed.

Section 3.6.1 and Appendix C contain recommendations for the performance of a lead system inspection as part of the specific license or Certificate of Compliance (CoC) renewal application. However, the Part 72 regulations have no requirement to perform such an inspection. Moreover, the CoC holder has no legal authority to compel any general licensee to perform such an inspection if that inspection is not already part of the licensing basis described in the storage system CoC or associated FSAR. Additionally, defining a "lead system" that would be bounding for all users of a single CoC, which may have several hundred loaded systems at multiple sites, with numerous unique geographical and environmental conditions, various materials of construction, and widely different in-service storage durations, is not workable.

Appendix C uses the term "lead system inspection" interchangeably for both the pre-application inspection (page C-2, lines 24-27) and for the determination of the lead system for baseline inspections at each individual Independent Spent Fuel Storage Installation (ISFSI) (page C-1, Section C.2 and page C-1, lines 15-24) for the purposes of implementing the aging management program. The multiple uses of the term "lead system inspection" is confusing with respect to its meaning for CoC holders and licensees.

When the NRC approved the change to 10CFR72 to allow for 40-year license and CoC terms (76 FR 8872) a commenter asked for the NRC to clarify when aging management requirements apply to casks. The NRC response was as follows:

"Aging management requirements only apply *after* [emphasis added] the cask is in service for the length of time equal to the term certified by the cask's initial CoC. For example, if the term of the initial CoC is 20 years, and a cask is placed into service at the end of the 19<sup>th</sup> year, then the general licensee would need to begin implementing the appropriate aging management requirements at the end of the 39<sup>th</sup> year, assuming the CoC was renewed."

Stipulating an inspection prior to the period of extended operation (PEO) should be assessed against the backfit provisions in 10 CFR 72.62(a). The current CoCs that have been approved for a period of twenty years have been certified to be safe without the need for additional inspection (other than those already specified in the storage system CoC or FSAR).

**Recommendation:** The NEI Dry Storage Task Force has given careful consideration to the following proposed terminology and approach for system inspections as a part of license renewal. The following terms, not currently included in the NUREG-1927 glossary, are defined below and will be included in NEI 14-03. The NRC may also consider adding these terms to the glossary in NUREG-1927.

**Pre-application inspection:** This is an inspection performed at the discretion of the licensee and/or CoC holder prior to submittal of the renewal application to (1) determine whether any SSCs have undergone unanticipated degradation, (2) to confirm existing TLAAs and inform the extension of those TLAAs throughout the period of extended operation (PEO), and (3) to help determine the appropriate AMPs needed through the PEO.

**Baseline inspection:** This is the first inspection of lead components in accordance with the AMP defined by the renewed site-specific license or CoC.

**Lead-component (replacement for lead system):** The lead component is that SSC or subcomponent of an SSC at an ISFSI that is determined to be susceptible to the aging mechanism identified and for which an AMP is applicable.

With these definitions, the AMP identifies the inspection of in-scope SSCs and subcomponents through the PEO being requested. The licensee then implements the AMP by identifying the lead component(s) (for their ISFSI) to determine which system to inspect for a given SSC or subcomponent within the scope of that AMP. That inspection is performed in accordance with the inspection requirements and acceptance criteria defined in the AMP which has been approved by the NRC as part of the license renewal application. The licensee should utilize previous lead component inspections, possibly conducted at other sites to determine the applicability of those inspections to their individual site for the purposes of satisfying the requirements of the AMP. Additionally, the licensee should have the flexibility to optimize inspections by allowing a component that is similar in susceptibility to the lead component to be the component inspected based on the accessibility to the storage system and As Low As Reasonably Achievable (ALARA) considerations. This will allow for a more efficient use of personnel and resources, while eliminating unnecessary worker radiation exposure and cost.

The results of any evaluation should be made available for NRC inspection, as is the current practice. NRC's guidance should allow flexibility for licensees and CoC holders to demonstrate that sufficient information exists to determine the appropriate AMPs from previously conducted inspections and other sources of information (e.g., research, operating experience, monitoring, etc.).

**Principle #2: Aging management program structures that are sufficiently flexible to assure that lessons learned can be efficiently addressed – the essence of learning aging management**

**Comment (Technical Specification/CoC content):** The guidance document, and in particular Section 1.4.7, discusses the potential for inclusion of AMPs in the Technical Specification (TS) or as conditions in the renewed license or CoC. One of the key aspects of effective aging management and the “tollgate” approach contained in NEI 14-03 is the ability of any AMP to be updated as inspection results, research findings and operational data become available. Inclusion of an excessive amount of detail in the TS or CoC will restrict the ability of licensees and CoC holders to make, in a timely and effective matter, the updates which will be a vital part of a learning aging management program. Therefore, it is recommended that clear criteria be defined for the purposes of delineating the detail to be included in the TS, specific license or CoC versus the ISFSI storage system FSAR and the implementing procedures.

In 2013, NEI submitted a proposed rulemaking<sup>1</sup> for the express purposes of defining criteria to determine the level of detail to be included in the TS of a specific system license or CoC. The defined criteria contained in the PRM lays a foundation for making a risk-informed assessment to determine the information to be included in the TS and license/CoC. The current guidance, which leaves the details of the information over which the NRC retains change control up to individual applicants and NRC reviewers—dependent on their ability to negotiate content on a case-by-case basis—does not provide for a stable, efficient or reliable regulatory environment.

10 CFR Part 54, “Requirements for Renewal of Operating licenses for Nuclear Power Plants,” provides a worthwhile example of the appropriate level of detail to be contained in the license and TS with regard to license renewal and AMPs. For operating reactors, the TS contains a commitment to have an AMP (similar to a Quality Assurance Program, or an Emergency Preparedness Program) while the details of the program are contained in the FSAR and the licensee’s implementing procedures subject to 10 CFR 50.59 change control. There are typically no changes to an operating plant’s TS related to license renewal. We recommend that NUREG-1927, Revision 1, be constructed consistent with this precedent.

**Comment (Application of CoC AMPs to multiple sites):** Renewal of CoCs and the relationship to the general licensee warrant special consideration that is unique from specific ISFSI license renewal. In the case of a specific license renewal, the licensee is the applicant. However, for renewal of CoCs, the applicant is the certificate holder, and the licensees are those Part 50 license-holders who have chosen to use the dry storage system covered by the individual CoC at their ISFSI. General licensees may have multiple systems, loaded over several decades, with individual casks entering the period of extended operation at different times, based upon when each individual cask was loaded. General

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<sup>1</sup> PRM 72-7 – Petition for Rulemaking Submitted by NEI to Amend 10 CFR Part 72, “Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-related Greater Than Class C Waste” (ML12299A380).

licensees also may be using several different storage system designs certified under different CoCs at the same site ISFSI.

The example AMPs contained in Appendix B do not reflect the possibility that different general licensees' ISFSIs may experience distinctly different environmental conditions. Therefore AMPs approved generically under a renewed CoC could perhaps be implemented with different frequencies or applicability among general licensees with less aggressive environments than the limiting case environment considered by the CoC holder in developing the AMPs. The example AMPs should be updated with guidance on how individual general licensees should determine the applicability of AMPs to their specific site depending on their site-specific environment and the process for modifying the AMPs under 10 CFR 72.48 and documenting those AMP modifications in the site 72.212 Evaluation Report. For example, management of chloride-induced stress corrosion cracking (CISCC) of a stainless steel canister by a general licensee for an ISFSI in a fresh water environment that has minimal chloride bearing substances in the ISFSI area should not include implementing the associated AMP inspections of the canister as frequently as a licensee with canisters at an ISFSI site located near a salt-water environment.

**Comment (Reliance on the licensee's Corrective Action Process):** The example AMP on CISCC in Appendix C includes an extensive discussion of the expected corrective actions, including specific, numerical increases in the sample size and inspection frequency, and use of more rigorous inspection methods. It is the role of the licensee to use its Corrective Action Program (CAP) to determine the appropriate corrective actions needed, including making changes to inspection frequencies, techniques, and sample sizes. The corrective actions stated in the example AMP are too detailed and should be simplified to ensure that licensees have sufficient flexibility to determine the appropriate corrective actions and extent of condition for their site. At a minimum, wherever numerical values are shown in the sample AMP (e.g., sample size increases), they should be shown in brackets, indicating that these values are examples and the licensee or CoC holder should determine the appropriate value. The corrective actions description on page B-16 and B-17 associated with reinforced concrete structures are reflective of the appropriate level of detail for corrective actions associated with an AMP.

**Comment (Surrogate inspections to inform AMPs):** Section C.4 of Appendix C stipulates that use of surrogates for lead system inspections cannot be referred to by an applicant. However, it is anticipated that as general and site-specific licensees enter the period of extended operation and additional inspections are conducted as part of an aging management program, a population of data will be created and shared as operating experience that will properly inform licensees with ISFSIs entering the PEO later of the rate of specific aging effects for their sites, based upon their site environmental conditions. Additionally, ongoing research and guidance is being developed, such as the EPRI Susceptibility Assessment and CISCC aging management program guidance, which will provide criteria to licensees to determine their relative susceptibility to CISCC compared to another site and other CISCC aging management insight. Therefore, it is requested that Section C.4 be revised to allow the use of surrogate inspections to inform the AMP. This concept is very important to the effective implementation of learning aging management. NEI 14-03, Revision 1 will propose an industry-wide operating experience sharing program in support of this approach.

**Comment (Reporting requirements):** The example AMPs in Appendix B provide several instances where a licensee would provide a report to the NRC based upon the results of an inspection and the potential corrective actions. It is important for licensees to have controls and programs in place for reporting results to the NRC. 10 CFR 72.75 already provides reporting requirements for specific and general licensees, ranging from one-hour to eight-hour verbal reports, with follow-up written reports. If additional reporting requirements are to be included in a licensee's program, rulemaking should be undertaken to modify 72.75. It should be noted that any inspection reports and periodic tollgate assessments can be reviewed as part of the NRC's inspection and enforcement process. NEI 14-03 will provide additional details on the industry operating experience sharing program.

### **Principle #3: Aging management programs that are appropriately focused**

**Comment (Application of aging management to temporarily used equipment, transfer cask and cask transporter):** NUREG-1927, Section 2.4.2.2 discusses whether transfer casks and transporter devices are included in the scope of license renewal. The industry agrees that aging effects should be considered in assuring the capability of these items to perform any safety function they may have. However, it should be recognized in NUREG-1927 that these types of equipment are not in continual service and are more appropriately classified as "tools" with an Important to Safety function only when they are in use. Therefore, unless a unique aging mechanism is identified in the renewal application, AMPs for these items should simply refer to the normal periodic or pre-use maintenance and inspection programs already in place for the components. These programs, either described in the ISFSI or storage system FSAR or invoked via commitments to codes and standards (e.g. ANSI N14.6), have already been accepted by the NRC as adequate to ensure that the equipment is able to perform its design basis functions before being used. This approach ensures that inspections of such equipment are timely and are focused on when the equipment is being used to perform a safety function rather than conducting unnecessary inspections for equipment that is not in use.

**Comment (Aging of equipment prior to being placed in service):** Important to Safety equipment that is delivered to an ISFSI site and stored for some time before use is governed by the licensee's quality assurance program, which ensures the component can perform its intended function(s) use when placed into service. Specifically, 10 CFR 72.166 and 10 CFR 50, Appendix B, Criterion XIII both require measures to be established to control the "handling, storage, shipping, cleaning, and preservation of materials and equipment ... to prevent damage or deterioration."

In accordance with these requirements, prior to placing a component in service, the licensee needs to ensure that the component is capable of performing its intended function. Therefore, NEI recommends that the NRC continue with the currently-accepted practice of determining the beginning of the storage term based on when the storage system is loaded with spent fuel and other authorized contents, and placed into service at the ISFSI pad. Any other method would create an overly complicated scenario where the end of the storage period could be dependent upon any of a number of factors (time of fabrication, period of time an empty storage canister or cask is stored on site, etc.).



Additionally, using the date when the system is placed in service would provide consistency with the dates provided to the NRC by the licensee as part of the notification requirements in 72.212(b).

It should be noted that precedence exists from power reactor construction and licensing for beginning the license term based upon when the plant entered commercial operation. Many reactors that were licensed under the 10 CFR 50 process applied for and were granted approval by the NRC to recover the construction period and begin the licensed term of the reactor based on when the reactor began operation. Given that many of the materials of construction and aging mechanisms are similar between reactors and dry cask storage systems, a strong precedent exists for beginning the licensed term for an individual dry storage system, based on when that storage system was placed in service.

**Specific Comments on Draft NUREG-1927, Revision 1, "Standard Review Plan for Renewal of Specific Licenses and Certificates of Compliance for Dry Storage of Spent Nuclear Fuel"**

Page	Line	Comment
1	21	Delete "revised technical." Not needed. Could be new rather than revised.
1	40	Change "developed" to "approved." Only should be using approved ISGs.
5	8-9	Add "(specific licenses only)" after the entries.
6	14-15	Says 72.22 does not apply to CoC holders but "the reviewer should <i>ensure</i> " CoC holders submit the info in 72.22. 10 CFR 72.13 clearly stipulates information required for specific licensees, general licensees and CoC holders. To change the applicability of 72.22 to CoC holders should be implemented through rulemaking, not an NRC guidance document. It should be noted that this information is generally already contained in the certificate.
8	6	With respect to exemptions, does a CoC holder need to identify exemptions that General Licensees have taken to the CoC? Is there an opportunity to include wording in the renewed application that addresses exemptions and allows users to clear them from the licensing bases? Does this apply only to specific licensees?
9 F-1	8-9 14-15	These sentences are not consistent with Appendix F, Figure F-1. Casks placed into service under an amendment not being renewed (either at the time of the first CoC renewal or subsequent CoC renewals) are allowed to stay in service for the full CoC term in effect at the time the cask is placed into service. Therefore, these casks need not be taken out of service when the CoC amendment under which they were loaded (initial or previously renewed) expires. Because this guidance addresses the first and subsequent renewals, we recommend deleting "upon expiration" from this sentence and adding to the end of the sentence "no later than a term of service equal to the initial or renewed CoC term in effect at the time the cask was placed into service."

Page	Line	Comment
9	9	For casks loaded under an amendment not renewed, add an option to convert those casks to an amendment that is renewed per 72.212, prior to reaching the end of the storage term.
9	21-25	Clarify whether the NRC expects applicants to supply non-proprietary versions of proprietary documents for docketing and public availability.
9	27-28	Would licensing basis wording changes that do not affect the design bases be allowed by this statement? What changes are allowed? Relicensing is a major licensing activity and it represents an opportunity to clean-up certain kinds of issues that are not associated with the design bases but are associated with the license bases and creates problems for users.
11	1-2	A license condition is not needed for future LARs to include aging management programs.
11	5	Recommend removing CoC. Conditions should only be added to the licensing basis (e.g., cask's FSAR) and not to the CoC.
11	9-11	What is the purpose of reiterating the AMP in an Appendix of the SER? Documenting an AMP in the SER instead of the FSAR is not an apple-to-apples set of options. The SER is not subject to 72.48 and therefore could be interpreted as making the aging management program static. This would be counter to the goals of a learning program. It is recommended that this sentence be removed. PRM 72-7 includes a provision to remove review of the SER by the general licensee as a regulatory requirement.
11	14-15	There is no reason to have a license condition to require procedures. The licensees' QA programs require them to have procedures for safety-significant activities. Additionally, this sentence implies that the CoC holder would create implementing procedures, when this is a responsibility of the licensee.
11	17	The specific edition and addenda of codes and standards approved as part of the amendment are part of the design basis (and therefore not subject to review). Provide clarification on the application of newly issued or revised codes and standards.

<b>Page</b>	<b>Line</b>	<b>Comment</b>
11	22-23	Define a "critical element" and get OGC concurrence if this is going to be the basis to include license conditions or Tech Spec requirements
11	27-28	This sentence duplicates lines 1 and 2 on the same page. See comment on 11 (1-2)
11	30	The term "as-needed" is vague. Any conditions should have a clear safety basis (preferably specific criteria) that establishes why the NRC needs to retain change control.
11	32-33	How do license conditions "strengthen the technical basis for the reviewer to reach reasonable assurance"? The technical basis should be based on the TLAA and AMP, if needed.
13	22	Should there be a dot at the intersection of the column for "72.236 Applicable Sections" and the row for "SSCs not within the Scope of Specific License Renewal"?

Page	Line	Comment
13 46	16 Footnote	<p>The NRC has removed the terms "current licensing basis (CLB)" and "licensing basis" from the document as described in the footnote on page 46 and replaced that term with "design basis" on page 13 and elsewhere. The footnote further states that "The NRC does not believe that it is appropriate for the CLB to be applied to cask CoC renewals, which are generic." The industry disagrees that the term licensing basis does not apply to CoC renewals. While CoCs are generic, they establish the licensing bases for all general licensees using that cask design under the CoC. We also believe the term "licensing basis" is important for license and CoC renewals to establish the regulatory baseline for the application.</p> <p>The industry does agree that the term "<i>current</i> licensing basis" may not be accurate for CoC renewals because all approved CoC amendments listed in 10 CFR 72.214 remain active and general licensees may use any approved CoC amendment. Thus, the industry believes both "licensing basis" and "design basis" are important terms to include in NUREG-1927 and NEI 14-03. The industry intends to add definitions of "Design Bases" and "Licensing Basis" to the Glossary in NEI 14-03. The definition of design bases will be taken from 10 CFR 72.3. The following definition of licensing basis, to be added the NEI 14-03 glossary, has been adapted from the NRC's definition of "current licensing basis" in 10 CFR 54.3:</p> <p><b>Licensing Basis</b> –The set of NRC requirements applicable to a specific ISFSI or DSS design and a licensee's or CoC holder's written commitments for ensuring compliance with and operation within applicable NRC requirements, and the ISFSI- or DSS-specific design basis (including all applicable modifications and additions to such commitments over the life of the license or CoC) that are docketed and in effect. The licensing basis includes applicable NRC regulations and appendices thereto; orders; license conditions; exemptions; and technical specifications. The licensing basis includes the ISFSI- and cask-specific design-basis information defined in 10 CFR 72.3 as documented in the latest ISFSI FSAR or applicable DSS FSAR revision for the ISFSI site. The licensing basis also includes the licensee's or CoC holder's commitments remaining in effect that were made in docketed licensing correspondence such as responses to NRC bulletins, generic letters, and enforcement actions, as well as licensee commitments documented in NRC safety evaluations or licensee event reports.</p>
14	19-32	Add "approved exemptions" to the list for specific licensees.

Page	Line	Comment
14	33	NUREG/CR-6407 was issued in February 1996 which delineates the 3 levels of ITS, 'A', 'B' and 'C'. Older ISFSIs and CoCs have a basis that pre-dated this NUREG. A clarification statement should be added here about facilities that began operation prior to the publishing of NUREG/CR-6407, and more importantly that the basis of the safety classification is the information contained in the licensing basis documentation (i.e., FSAR, 72.48s, etc).
18	10	With respect NUREG/CR-6407, would a QA Category C item (minor impact on safety) be considered "important to safety"? Why not align this section with the three classifications in the NUREG to eliminate ambiguity for those applicants that use NUREG/CR-6407 as their basis?
18	5	What is meant by fuel in a "disrupted state"? Where is this defined? Regardless of the state of the fuel assembly, the internals and fuel are part of the scope of the renewal.
18	4-5	Alternately, if a canister is intact (inert atmosphere maintained) and max cladding temperature & thermal cycling has been managed (both demonstrated for the initial license period in the FSAR and presumably revalidated during the relicensing application), wouldn't the spent fuel be in a known configuration (i.e., the same configuration it was in when loaded)? This was found to be an acceptable approach in previous license renewal applications.
18	27-30	<p>SSCs associated with physical protection of the ISFSI are specifically excluded from review of the renewal request as illustrated in Section 2.2, yet in section 2.4.3, the reviewer is directed to verify that SSCs associated with physical protection of the ISFSI do not meet the scoping category in section 2.4.2. This should not be necessary since these SSCs are specifically excluded from review of the renewal request.</p> <p>The same comment is applicable to SSCs associated with the ISFSI Emergency Plan.</p> <p>Recommend deleting bullet 3 and 4 on page 18.</p>

Page	Line	Comment
22	Figure 3-1	The SSCs that are not subject to aging mechanisms do not need to be included in the FSAR supplement. There should be a separate screening AMR summary document outside the FSAR that lists the SSCs that were evaluated for aging and screened out. Only the in-scope SSCs should be included in the FSAR supplement.
25	16-18	This list of information requires clarification. Some of it is the subject of current requirements (such as radiation field), some of it is not. Wind, for instance, would be hard to summarize for many users. Also, how far back should it go? What is the reviewer expected to do with this data. What are CoC holders expected to provide when they have potentially many users? Recommend changing to "pertinent" environmental data that has a bearing on an AMP that is being recommended for a SSC. The amount of information that is needed to be provided by a CoC holder should be clearly understood.
25	18	Change to "range of operating and service conditions."
26	5-9	Is it reasonable to request a CoC applicant to provide the requested environmental data for potential sites that the storage system is implemented? Change "evaluated" to "considered" on page 26, line 6.
26	6	Change to "the potential for deposition." Licensees should have the option of addressing degradation mechanisms via aging management programs without having to gather specific environmental and deposition data prior to submitting an application.
29	21-22	An analysis to justify not including in aging management activities is a TLAA by any other name and this approach seems to violate 72.3 definition of TLAA (6). This wording is confusing as it is not clear whether "analyses that are not TLAAs" can be used to justify the frequency of or not needing an AMP.
32	37	Please clarify what is meant by: "The method should be adequate and <i>proven</i> ..." What does proven mean? Demonstrated? Qualified?
33	16-19	Suggest deleting "Data Collection." It does not add any value.
34	3	It is impossible to "avoid" using non-quantifiable terms. Suggest using "minimize."

Page	Line	Comment
34	23	Revise to "... and includes provisions ( <i>as appropriate</i> ) to:" Not all of these activities are performed, depending on the issue being addressed in the corrective action process.
34	33-36	This paragraph requiring all applicable corrective actions to be discussed in the application appears to contradict lines 16-23, which (correctly) defers to the licensee corrective action program (CAP). Specific corrective actions will depend on the problem found, severity, and safety significance. The aging management program should not be used to supersede the licensee corrective action program.
35	12	Suggest changing "canister" to "carbon steel components." Coating a canister for aging management of corrosion is not a good example of confirming the acceptability of corrective actions.
35	11-13	A canister in storage, horizontal resting on rails would be difficult to coat. Does the NRC mean the overpack vs. canister?
35	17-26	Should state that the following are examples of provisions (Lines 21 to 22) as other Appendix B criterion apply to the AMP, e.g. Test Control, etc. which are not listed.
35	17-29	This section implies programs are to be included in the FSAR supplement. Please clarify. Programs are not typically included in FSARs. Most licensees and CoC holders perform these actions as a part of their NRC-approved QA Program required procedure set. Suggest this section be simplified to verifying that the applicant has an NRC-approved QA Program.
35	27-28	Delete (a). Reporting inspection results to the NRC would be no different than any other activity and NRC reporting is governed by existing regulation (10 CFR 72.75), not an AMP.



Page	Line	Comment
36	2, 28	This "relevant international and non-nuclear operating experience" item is part of the minimum expected constituents of the OE to be evaluated. It is not reasonable to expect, and likely not even possible to achieve, absolute knowledge of all relevant international and non-nuclear OE. This should be changed to "any known relevant international and non-nuclear operating experience." This issue will be addressed in the operating experience sharing program proposed in NEI 14-03.
36	8-13	This paragraph can be deleted as it is covered in the operating experience sharing section of NEI 14-03. The methods to obtain, aggregate, and enter specific and industry-wide operating experience will be defined.
36	22	Change "an licensee's" to "a licensee's"
36	27	Under the section for Learning AMPs, it states that the NRC reviewer "should ensure that applicants commit to future reviews of OE." This seems to be a redundant requirement, since AMPs will need to include a section for OE that will cover experience capturing and assessment. It's not clear how applicants (particularly CoC holders) would commit to future reviews of OE beyond current established procedures (both CAP and OE program). This concept will be captured in the tollgate assessments contained in NEI 14-03
36	33	Change "deficiencies" to "lessons learned."
37	1-2	NEI 14-03 will be Revision 1 and will have a new title: "Format, Content, and Implementation Guidance for Dry Cask Storage Operations-Based Aging Management"
37	15-16	Tollgates are not intended to be a part of the Tech Specs or license conditions.
37	17-22	Updated NEI 14-03 will include a more comprehensive description of an operating experience sharing program. Each applicant should not have to provide details about the industry operating experience sharing program.

Page	Line	Comment
38	Figure 3-2	Figure 3-2 should be deleted. The flow diagram is just a listing of the 10 AMP elements, with no apparent ties to their use in a flow chart. For example "corrective action" is a decision box with only one output. In the sense of a true learning AMP, external and internal OE is primarily input that could be used to inform any of the various elements of a given AMP.
39	Section 3.6.2, 3.6.3 and Appendix E	These section discuss the need to develop the AMP infrastructure prior to entering the period of extended operation, but does not go into details about the necessary framework or acceptable implementation schedule (other than the note that the infrastructure for AMP implementation should be no later than one year from the date the NRC issues a renewed Specific license or CoC). Having limited guidance and short time frame may be very challenging for those general licensees that have loaded early on in the initial CoC term, and will most likely be under a period of timely renewal for the application submittal, depending on the length of NRC review. To ensure that general licensees have sufficient time to budget, plan resources and conduct a relevant inspection it is recommended to change this requirement to eighteen months
39	16-25	General licensees that loaded soon after a CoC was made effective <i>will not</i> be able to implement AMP infrastructure prior to extending the period of extended operation, because the renewal application and any proposed AMPs will be still under review by the NRC. One year for general licensees in timely renewal to implement AMPs is a short timeframe for budgeting and planning resources to ensure that reliable inspection capabilities are qualified and available. Recommend changing one year to two years.
47	29	Should "testing" be more specific? Does monitoring include all gathered data including AMP inspections, or only data from non-aging management activities such as TS surveillance, FSAR-required annual inspections, etc?  Clarification is requested on what testing is being referred to? How does the referred-to testing differ from monitoring?

Page	Line	Comment
47	34	"Controlling water chemistry" is not a good example for DSS because during storage, there is no water chemistry to control. (Wet ISFSIs are specifically excluded from this guidance.) Is this intended to mean groundwater chemistry? Suggest changing to "monitoring water chemistry."
47	40	"No temporary or permanent degradation..." is too restrictive. Some degradation, especially temporary, is expected and may occur. AMPs are being put in place to ensure degradation is managed and mitigated, if necessary. Recommend deleting "and to experience no temporary or permanent degradation from normal operations, events and conditions."
48	17	Change "design" to "Certificate of Compliance." CoCs, not designs, are renewed.
49	8	What is the purpose of referring to NUREG-1536 for just the definition of retrievability? Retrievability is contained in 10CFR 72
49	23	Change "features" to "SSCs."
A-2	The first bullet in the right column	This bullet states that quantitative information must be provided if a non-quantifiable term is used. This is confusing. If a quantifiable term can be used it should be used. Can the NRC clarify?
	Appendix B	It would be beneficial for one of the example AMPs to have an example of a TLAA/AMP for a general license with different sites. A site on the coast will experience different environmental conditions than a site in the desert. This will likely result in different degradation mechanisms, TLAAs and AMPs. An example of how the same cask can have a different AMP or TLAA at each of two sites would be helpful.
	Appendix B	The level of detail contained in the example aging management programs would be inappropriate for a License Condition or inclusion in the Tech Spec, however would be more appropriately addressed in the implementing procedures. Reliance should be on the existing Corrective Action Program and NRC inspectors consistent with what is required for operating reactors that have undergone license renewal.

Page	Line	Comment
B-2	Scope of Program	Recommend deleting the fifth bullet. Some horizontal surfaces (the top on a vertically oriented canister) are the least susceptible area on the can (hottest, thickest). They are probably the easiest surfaces to inspect, but not highly valuable or significant to the safety of the system.
B-3	Detection of Aging Effects	The example AMP provides a very low threshold to performing volumetric examination (i.e. evidence of localized attack (pitting), even away from a weld). Therefore, any evidence of aging mechanisms would lead to volumetric or surface examination, which is not reasonable.
B-4	Detection of Aging Effects	The requirement to implement surface and/or volumetric upon discovery of localized corrosion (e.g. pitting) is impracticable. While CISCC often initiates at the base of pits, most pits are not initiators of CISCC. Suggest these methods only be required when the observed localized corrosion exceeds the acceptance criteria of IWB-3640.
B-4	1st paragraph	Since efforts to define ASME Section XI requirements for dry storage are just beginning, flexibility needs to be maintained for future improvements. Suggest revising the end of the sentence to "...inspection techniques consistent with available and applicable codes and standards."
B-4	Sample Size	Need to allow for bounding sites in the future. Recommend changing to: "Initially one canister at each site until sufficient data and experience are gathered to justify bounding a site with inspection results from another site."
B-4	Frequency	Add a note that this may be modified as experience and inspection data become available indicating a change is warranted in the inspection frequency.
B-5 B-9	Elements 5 and 10	These seem like appropriate places to reference the operations-based aging management concept of analysis and periodic assessments ("toll gates") as described in NEI 14-03.
B-6	Corrective Actions	Detection of localized corrosion (e.g. pitting) that does not exceed the acceptance criteria of IWB-3640 should not trigger sample expansion.

Page	Line	Comment
B-7	1 <sup>st</sup> paragraph	Change "also requires an expansion" to "may warrant an expansion." The determination of the appropriate corrective actions and whether additional canisters need to be inspected should be determined as part of the corrective action and the extent of conditions evaluation that is part of the quality assurance program.
B-7	Extent of Condition	Suggest adding reference to forthcoming EPRI susceptibility criteria. At end add "...or canisters of similar susceptibility as determined by developed criteria."
B-7	Disposition	Inspection results are not reportable to the NRC in accordance with 10 CFR 72.75.
B-7	Disposition	This section is overly prescriptive for an "example." Licensees have established corrective action programs to address this (i.e., inspection findings entered into the corrective action program, reportability is assessed, etc.).
B-8	Disposition	What do the alternatives to "are not permitted to remain in service" actually mean, particularly at a shutdown nuclear plant? This wording might be appropriate for class 1 piping, but is not appropriate for a low-pressure canister with no potential to create the kind of accidents we are talking about with class 1 piping.
B-8	Admin Controls	Delete bullet "Frequency/methods for reporting inspection results to the NRC," as this will be covered by the industry operating experience sharing program contained in NEI 14-03.
B-12	16-18 (and in each element of the AMP in Table B-2)	AMP indicates use of radiation surveys to ensure shielding function. Radiation surveys are routinely performed by the licensees to ensure compliance with 10 CFR 72.104. Use of radiation surveys results cannot be a CoC holder activity.
B-12	16-18	Why include activities in an aging management AMP that are already a part of the existing programmatic requirements of the DSS? These requirements would not be expected to change during the period of extended operation.
B-12	18	For daily inspections, add "if applicable" at the end. Not all licenses are required to inspect the vents.

Page	Line	Comment
B-12	Scope, Item 2	Change "Ground water chemistry program to manage" to "Ground water monitoring program to identify." The purpose of a groundwater chemistry program is to identify aging mechanisms versus managing the groundwater chemistry.
B-12	#3 2 <sup>nd</sup> bullet	"as a <i>gamma and</i> neutron shield." Also text seems missing: what is meant by "at near system locations"?
B-12	Scope, Item 3	This is something licensees and CoC holders already are required to do as a part of their licenses/CoCs and is not something that really addresses aging of reinforced concrete structures. Recommend removing Item 3.
B-12	Scope	Change "provides a means to address" to "provides a means to identify."
B-13	TLAA criteria for concrete neutron fluence	There is little to no change in mechanical properties for neutron fluence up to $10^{19}$ n/cm <sup>2</sup> ( $10^{23}$ n/m <sup>2</sup> ).
B-13	Scope-Fluence Numbers	These are quite a bit lower than the values in NUREG/CR-7153, Vol. 4 (i.e., $10^{19}$ n/cm <sup>2</sup> ).
B-13	Scope-temperature Limits	Temperature can be as high as 350°F for short-term events including off-normal events, per ACI and many DCS licensing bases. This should be reflected in the guidance.
B-13	Preventative Actions	In addition to inspection of vents, add "and/or temperature monitoring, as applicable."
B-13	Scope-Last sentence	Protective coatings on painted steel need to be the subject of a separate AMP. It is a complex subject, and not all painted steel in the various DCS systems have similar design and safety functions.
B-14	Parameters-"Efflorescence"	This is something of a special case. This phenomenon should be monitored and extreme cases should be addressed, but it is not usually detrimental (see NUREG/CR-7153, for example).

<b>Page</b>	<b>Line</b>	<b>Comment</b>
B-14	Parameters	"The Parameters evaluated are adequate..." — what does this sentence mean in the context of an AMP?
B-14	Parameters	The last sentence in this section: The radiation surveys are as prescribed by each licensee's radiation protection program and therefore should not be a part of the AMP.
B-15	Detection	Crack-depth determination is generally not possible and not a good attribute to use as an example.
B-15	Monitoring and Trending	Of the examples cited, dose rate is about the only one that is readily achievable and based on field surveys and rarely changes (in other words, not a very useful parameter for trending). Photographic evidence provides the best resource to monitor change.
B-16	Corrective Actions, last bullet	Change "e.g. results in the loss of intended function" to "per 72.75."
B-20	Middle of page	The HDRP is now using maximum assembly average burnup 55.5 GWD/MTU. (ML15133A082)
B-20	Last paragraph in 1	Burnup should be clarified as "rod-average" burnup, when discussing burnup. Maximum rod-average burnup for commercial licensees is 62 GWD/MTU.
B-20	Last paragraph in 1	The burnup, cladding type and temperatures of any demonstration program should not be used to limit the applicability of a demonstration program. The original low burnup demonstration project conducted at Idaho National Lab project covered only Zircaloy-4, with assembly average burnups of approximately 36 GWD/MTU, but the NRC extended applicability up to 45 GWD/MTU and all zirconium-based alloys. Individual licensees should be able to make a case as to the applicability of a demonstration program to the fuel they have stored at their ISFSI.

Page	Line	Comment
B-20	Last sentence in 1 (#3)	Use of design basis temperatures to compare to the best-estimate demonstration cask temperatures is not a valid comparison. Temperature comparisons between a demonstration project and loaded systems should be the same basis (i.e., best-estimate to best-estimate, or design-basis to design-basis).
B-22	Footnote 2	Is the 0.43 gram-mole a new limit on moisture content for drying? New requirements should not be specified in guidance.
B-22	Footnote 3	Suggest deleting. Does not add value.
B-25	#2, last sentence	The risk of opening a cask/canister should be evaluated against the risk of cladding degradation occurring in a cask/canister meeting it's design basis. Does this requirement to open a cask at each site make regulatory sense from a risk perspective?
B-25	Table B-4	Table B-4 is unique relative to the other two sample AMPs. It basically provides some fallback position in the event the HBU demo program has not provided necessary data prior to those early loaded site where the initial storage term will expire prior to when demo results will be available. One of the fallback options is to initiate a corrective action. There is no need to provide further guidance as to what this needs to be. For the most part this would likely just be a long term tracking item to wait for the demo program surrogate data to be available since this may not be something that can be developed from analytical tools.
C-1	12	Add in "...SSC's in the renewal application" <i>and within the licensee's corrective action program.</i>
C-1	28	Suggest adding: "with the exception of transfer casks or other similar SSCs which are leased or are otherwise not actually on site."
C-1	41	DSS should be "DSSs."
C-2	24-25	Add a reference to Subsection C.5 for further discussion on this issue for CoC renewals.



Page	Line	Comment
C-2	36-40	DSS with the same materials, fabrication practices, and design modifications, in use at different sites, are more common than this guidance implies. The guidance can emphasize that use of surrogates should be carefully considered and must clearly justify the bounding scenario, but use of surrogates should not be dismissed out of hand.
C-2	36	While there is very limited operating experience specific to ISFSI DSS inspections, there is significant operating experience with the materials (stainless steels) and environments (chloride in atmosphere) of concern. This experience along with additional research (CISCC Testing, environmental monitoring), and model results has been factored into draft Susceptibility Assessment Criteria that will be published by EPRI in September 2015. These criteria can point the industry to specific canisters where material and environmental conditions indicate higher likelihood of CISCC. The concerns expressed relative to materials, fabrication practices, and design modifications would also be relevant to the comparison of two different canisters at the same site. Differences in environmental conditions are indeed critical to CISCC susceptibility and thus the industry should have flexibility to devote more inspection resources to sites where conditions are more conducive to CISCC initiation and growth. This section should be modified to provide flexibility.
C-2	37	Should add a qualifier for allowing bounding sites in the future after industry gets more data.
C-3	10-11	CoC holders are not known to own any currently deployed DSSs, so the phrase "the CoC holder may not own the deployed DSSs at general-licensed ISFSI sites" really should be changed to "the CoC holder very rarely owns the deployed DSSs at general-licensed ISFSI sites" to more properly set the stage for the remainder of the paragraph.
C-3	12-13	The sentence, "This demonstration, and thus, the lead system inspection to support it, is nevertheless the responsibility of the CoC holder as applicant," cannot be included. The guidance can encourage a collegial arrangement and emphasize the importance of lead inspections, as it very much does, but it cannot assign this responsibility on an entity which has no legal authority to meet it.

Page	Line	Comment
	Appendix D	The discussion of fuel cladding ductility and hydride re-orientation in Appendix D is not consistent with respect to the latest research findings, such as information presented at the REGCON2014, the 2015 Used Fuel Management Conference and the mechanical fatigue testing being conducted at Oak Ridge National Lab.
D-1	31	The statement that the fuel could be too brittle to retrieve is misleading. There are no design basis events under normal, off-normal or accident conditions that would apply enough load to fracture the cladding, even if it is brittle. Also, methods for retrieving fuel with severely damaged cladding do exist and could be deployed.
D-2	39	Change "LWR" to "HBU."
E-1	35-36	This statement should be revised to recognize that general licensees that are in timely renewal will have a grace period after the effective date of the renewed CoC to update the 72.212 Report.
E-1	New	Suggest the NRC adding an expectation that AMP-related information in the cask FSAR will be implemented by general licensees as-written, unless modified under the provisions of 10 CFR 72.48.
	Appendix F	This appendix should be expanded to provide more examples such as were contained in the Statements of Consideration with the initial rulemaking to change the license term to 40 years (76 FR 8872) and the April 8, 2015, ACRS meeting.
F-1	13-14	This is contrary to the second sentence of 72.212(a)(3), which reads, "For any cask placed into service during the final renewal term of a Certificate of Compliance, or during the term of a Certificate of Compliance that was not renewed, the general license for that cask shall terminate after a storage period not to exceed the length of the term certified by the cask's Certificate of Compliance."
F-2	Figure F-1	This chart says that all casks loaded during the initial license period of a license that is renewed have the same storage period, no matter when there were loaded during the initial license period. Is this the intent?

<b>Page</b>	<b>Line</b>	<b>Comment</b>
F-2	Figure F-1	Rectangular box in lower left corner – the text "A = remaining time in the initial license period" change to "A = remaining time in the initial CoC term"