


February 9, 2001

MEMORANDUM TO: File

FROM: Sam Lee, Sr. Materials Engineer 
Engineering Section
License Renewal and Standardization Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

SUBJECT: STAFF FOLLOW-UP ITEMS FROM NEI MEETINGS ON INDUSTRY'S
COMMENTS ON DRAFT IMPROVED LICENSE RENEWAL GUIDANCE
DOCUMENTS

On January 25, 30, and 31, 2001, the staff held public meetings with representatives from the Nuclear Energy Institute (NEI) to discuss industry's comments on the draft improved license renewal guidance documents. At the meetings, the staff agreed to further consider certain NEI comments. After the meetings, I sent the enclosed three e-mails to Mr. Doug Walters of NEI reflecting the results of the discussion from these meetings. NEI plans to use this information to determine, which, if any, industry comments that NEI would pursue with the staff's Division Directors.

Project No. 690

Enclosure: As stated

cc: PUBLIC

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On January 25, 30, and 31, 2001, the staff held public meetings with representatives from the Nuclear Energy Institute (NEI) to discuss industry's comments on the draft improved license renewal guidance documents. At the meetings, the staff agreed to further consider certain NEI comments. After the meetings, I sent the enclosed three e-mails to Mr. Doug Walters of NEI reflecting the results of the discussion from these meetings. NEI plans to use this information to determine, which, if any, industry comments that NEI would pursue with the staff's Division Directors.

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Enclosure: As stated

cc: PUBLIC

RLSB
S Lee *SSL*
2/9/01

RLSB:SC
PT Kud *[Signature]*
2/9/01

OFFICIAL RECORD COPY

From: Samson Lee
To: internet: DJW@NEI.ORG
Date: Wed, Feb 7, 2001 3:46 PM
Subject: Follow-up items on 1/25/01 meeting

Doug:

We have completed follow-up items from our 1/25/01 meeting on certain GALL/SRP items (see attached). We plan on attaching this to the 1/25/01 meeting summary.

Thanks,
Sam

CC: Cig, jxd, PTK

Issue Number/title	Meeting conclusion or action item	Proposed action item resolution or conclusion from action item.
2/ Small bore piping – need for one-time inspection	NEI/NRC agrees to disagree	No action item was identified for this issue
5, 17 & 18/ Threshold for neutron fluence in reactor vessel and internals (10E17)	NEI will consider staff's proposal further on the threshold for neutron fluence. Staff agreed to remove the specific recommendation for enhanced VT-1 and replace with it as an example of an effective methodology.	<p>Staff is considering to include the following:</p> <p>One example of a supplemental examination could be enhancement of the visual VT-1 examination of Section XI IWA-2210. A description of such an enhanced visual VT-1 examination could include the ability to achieve a 0.0005-in. resolution, with the conditions (e.g., lighting and surface cleanliness) of the inservice examination bounded by those used to demonstrate the resolution of the inspection technique.</p>
6/ Bolting – loss of pre-load and cyclic loading SCC	<p>NRC will investigate lubricants use in the bolting programs. NRC will look up documentation provided by NEI (BL 82-02). NEI will make a recommendation of how bolting should be addressed in GALL.</p>	<p>NEI commented to delete the aging effects/mechanisms of loss of pre-load due to stress relaxation and crack initiation/growth due to cyclic loading and stress corrosion cracking for carbon steel closure bolting in high-pressure or high-temperature systems.</p> <p>NRC staff conducted a conference call to clarify the issue on February 6, 2001, with NEI. The staff understands that the disulfide lubricants are no longer being used. The staff is concerned with the yield strength (YS) of the bolts. There are minimum technical specifications (107 ksi) but there are no maximum. Therefore, crack initiation and growth can still occur if the YS is high and there is moisture in the air. There is significant supporting evidence for crack initiation/growth due to cyclic loading and stress corrosion cracking. Field experience shows that SCC (NRC GL 91-17) caused 20% of the bolt failures. The bolts made of SA 193 Grade B7 can have YS as high as 175 ksi and failures have been reported with YS as low as 140 ksi. Crack initiation and growth can result in leakage.</p>

7/ Closure bolting – separate component	Unless NEI provides additional comments on how bolting should be addressed in GALL, this issue is resolved for March.	Resolved.
11 & 12/ Vessel circumferential and axial welds	NRC staff is to request Robin Dyle to clarify NEI position.	<p>The new wording for GALL to address this issue is proposed as follows:</p> <p>The revised writeup for line A1.2-c, neutron embrittlement of reactor vessel TLAA is proposed as follows:</p> <p>Neutron irradiation embrittlement is a time dependent aging mechanism that needs to be evaluated for the period of extended operation for all ferritic materials that have a neutron fluence of greater than $10E17$ n/cm² ($E > 1$ MeV) at the end of the license renewal term. Aspects of this evaluation may involve a time-limited aging analysis (TLAA) . In accordance with approved BWRVIP-74, the TLAA should evaluate the impact of neutron embrittlement on: (a) the adjusted reference temperature, the plant's pressure temperature limits, (b) the need for inservice inspection of circumferential welds, (c) the Charpy upper shelf energy or the equivalent margins analyses performed in accordance with 10 CFR 50, Appendix G. Additionally, the applicant should monitor axial beltline weld embrittlement. One acceptable method is to determine that the mean RTndt of the axial beltline welds at the end of the extended period of operation are less than the value specified by the staff in its May 7, 2000 letter. See the Standard Review Plan, Section 4.2 "Reactor Vessel Neutron Embrittlement" for details acceptable methods for meeting the requirements of 10CFR54.21(c).</p>

<p>13 Bottom head and pressurizer penetrations</p>	<p>GALL will be modified to make plant specific with the mpr to address the issue (similar to words that are in Void swelling)</p>	<p>Staff is considering to revise the GALL report as follows:</p> <p>A need for augmented program (plant specific program) could be eliminated for the vessel closure head penetrations such as vessel head vent pipe (Item A2.7.2) and other top head penetration (new Item A2.7.3 added) because they are covered by GL 97-01. Therefore, the AMP for Item A2.2.1 (Control Rod Drive Head Penetration) is sufficient for Items A2.7.2 and A2.7.3.</p> <p>For bottom head instrumentation tubes (Item A2.7.1), pressurizer instrument penetrations (Item C2.5.6) and pressurizer heater sheaths and sleeves (Item C2.5.10), they are subjected to Inservice Inspection for Class 1 components and Water Chemistry. However in addition, the applicant should provide a plant-specific AMP or participate in industry programs to manage PWSCC of Inconel 182 welds.</p>
<p>19 and 20 SCC in containment spray and standby liquid control</p>	<p>Staff will investigate the introduction of contaminants as an event because there is no experience of SCC at low temperatures. Staff will review NUREG/CR-6001 to see if SCC is appropriate.</p>	<p>Stress corrosion cracking (SCC) of stainless steel (SS) components exposed to borated water is possible at temperatures below 200°F if contaminants are present in the water. This is supported by operating experience at PWR plants (IN 79-19, IE Bulletin 79-17) As suggested by NEI at a public meeting on 01/25/01, the staff reviewed the information in NUREG/CR-6001 and concurred that operating experience indicates that degradation does not occur if water chemistry is maintained.</p> <p>Staff proposes that the GALL report be changed as a result of this comment to rely on water chemistry as the aging management program for the affected line items.</p>

<p>22 Delta ferrite limit for cast stainless steel – 25% vs. 40%</p>	<p>NEI agreed that staff should move forward with the 25% delta ferrite limit for cast stainless steel. They asked that staff review additional data later. Staff replied that when NEI provides the data then they should compare their data to the NRC data since there is several references from which the NRC has based their decision.</p>	<p>NEI may send additional data after March.</p>
<p>25 Buildup of deposit/flow blockage – impact on heat transfer</p>	<p>Staff to investigate flow blockage as an issue</p>	<p>NRC considers that biofouling affects both system flow performance and pressure boundary integrity. Flow performance is considered an active function covered under the current licensing basis and should not be included within the scope of license renewal. However, biofouling causes loss of material, which affects the pressure boundary and this passive function requires aging management.</p> <p>This position does not contradict License Renewal Issue No. 98-105 which states that the heat transfer function for heat exchangers is within the scope of license renewal. Therefore, biofouling of heat exchanger tubes require aging management.</p> <p>NRC proposes the following changes to the GALL report:</p> <ol style="list-style-type: none"> 1. The staff is considering revising the GALL report to delete all heat exchanger components except the tubes from the material column for buildup of deposits due to biofouling. 2. For all piping and components other than heat exchangers, the GALL report could be revised to delete all line items for buildup of deposits due to biofouling.

		<p>3. For all piping and components including heat exchangers, loss of material due to biofouling could be included as an aging effect for pressure boundary parts.</p> <p>4. The aging management program XI.M20 "Open-Cycle Cooling Water System" could be revised to remove reference to flow blockage.</p>
26 Biofouling – preventing intended function	<p>Actions are the same as item 25, NRC will discuss at Chris' meeting on January 31, 2001. Staff to investigate flow blockage as an issue.</p>	<p>For NEI comment G-VII-G-9, staff considers the buildup of deposit due to biofouling in fire protection applicable. Portions of the fire protection system are not routinely subjected to flow. The piping and fittings and miscellaneous components (filter, fire hydrant, mulsifier, pump casing, sprinkler, strainer, and valve bodies, containment isolation valves) in water-based fire protection systems are exposed to raw water and are therefore susceptible to biofouling. Biofouling can occur anywhere although the effect may be more prominently noted on the sprinklers. Biofouling can cause loss of material due to corrosion as described in #25 above. In addition, biofouling can plug up a backup water supply line (flow blockage).</p>
49 WCAP on internals	<p>NRC is to investigate wear of the guide tubes. NEI is to formulate position.</p>	<p>In item 49c, NEI commented to delete wear as an aging effect for the RCCA guide tubes, core barrel flange and guide tube cards because measurements have shown this effect to be not significant, or insignificant relative motion to result in wear. Staff agrees that wear of the RCCA guide tubes is not significant and this was confirmed in WCAP 14577. The line item for wear of the guide tubes in Gall will be removed based on this comment. Staff's conclusion for 49a, 49b, and 49d has not changed and NEI is considering their position.</p>

From: Samson Lee
To: internet: DJW@NEI.ORG
Date: Thu, Feb 8, 2001 1:03 PM
Subject: Follow-up items on 1/30/01 meeting

Doug:

We have completed follow-up items from our 1/30/01 meeting on certain GALL/SRP items (see attached). We plan on attaching this to the 1/30/01 meeting summary.

Thanks,
Sam

CC: Christopher Grimes, Pao-Tsin Kuo, pjk

**NEI Issues on Improved License Renewal Guidance Documents for Management Attention
(Based on 12/21/00 and 1/30/01 Public Meetings with NEI)**

Issue #	Topic	NEI Comment Number	Staff Preliminary Resolution
35	Use of IWE with Appendix J and coatings program	G-IIA1-10 G-XI.S4-1 G-XI.S8-1	<p>NEI commented (Comment No. G-IIA1-10) that the Appendix J (XI.S4) and Coatings (XI.S8) AMPs be deleted as GALL requirements for managing loss of material due to corrosion for steel elements of containment. NEI's justification is that the IWE (XI.S1) AMP is acceptable as a stand-alone program.</p> <p>Staff Consideration: The leak tightness is an intended function of containment [10 CFR 54.4(a)(1)(iii)] and is not included in the ISI requirements of IWE. Measurement of an unacceptable leak rate would require an assessment of the cause. The cause may be due to aging degradation from loss of material, cracking, and/or change in material properties. Consequently, the staff considers that this program supplements the ISI program for detecting aging effects. Although the 1992 and 1995 editions of IWE reference App. J leak rate testing for certain examinations, they are not as comprehensive as the requirements of 10 CFR Part 50, Appendix J. In addition, the 1998 and later editions of IWE no longer reference App. J leak rate testing.</p> <p>With respect to the Coatings Program, the GALL report (XI.S8) defines a technical basis acceptable to the staff for a coatings monitoring and maintenance program. If a coatings program is credited for managing loss of material due to corrosion during the current licensing term, then the report recommends that it needs to be continued during the period of extended operation. An example of this is a relief request from IWE inspections based on maintenance of protective coatings to control corrosion. The staff plans on clarifying the GALL Chapter II tables in all applicable locations with respect to the protective coatings program.</p> <p>NEI commented (Comment No. G-XI.S4-1) that the containment inspection requirements of 10 CFR 50 Appendix J be acknowledged in the Evaluation and Technical Basis for the Appendix J (XI.S4) AMP. NEI's justification is that, prior to</p>

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			<p>mandatory IWE and IWL inspections, Appendix J inspections were performed and provided the operating experience base for containment aging.</p> <p>Staff Consideration: The report includes discussion regarding prior Appendix J containment inspections in the discussion of "Operating Experience" for the IWE (XI.S1) and IWL (XI.S2) AMPs. Since the mandatory inspection requirements of IWE and IWL have essentially superceded the Appendix J inspections, the Evaluation and Technical Basis for the Appendix J (XI.S4) AMP only addresses the leak rate testing requirements of 10 CFR 50 Appendix J.</p>
36	Inaccessible areas – containment liner	G-IIA1-1	<p>NEI commented (Comment No. G-IIA1-1) "There are additional requirements for inspection of inaccessible areas when there are no indications of degradation for (adjacent, nearby) accessible areas. This requirement should be removed from Evaluation and Technical Basis and Further Evaluation." NEI's justification is that imposing such requirements is tantamount to additional rulemaking over and above 10 CFR 50.55a without adhering to the rulemaking process. Section (b)(2)(viii)(E) of 10 CFR 50.55a says "the licensee shall evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence of or result in degradation to such inaccessible areas."</p> <p>Staff Consideration: The staff considers that the GALL report is not equivalent to rulemaking. It defines a basis acceptable to the staff for aging management for license renewal. To clarify the GALL provisions for aging management of inaccessible areas, the staff has developed specific criteria that can be applied to address inaccessible areas as follows:</p> <p>For the "Aggressive Chemical Attack" and "Corrosion of Embedded Steel" aging</p>

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			<p>mechanisms, aging management of below-grade exterior inaccessible areas is considered satisfied if the applicant establishes that the below-grade environment is not aggressive, in accordance with criteria to be presented in revised GALL Chapter II.</p> <p>For the “Leaching of Calcium Hydroxide” aging mechanism, aging management of below-grade exterior inaccessible areas is considered satisfied if the applicant establishes that this aging mechanism is not significant, in accordance with criteria to be presented in revised GALL Chapter II.</p> <p>For corrosion of inaccessible steel areas of containment, the staff’s concern is that concrete containment steel liners or steel containment shells that are embedded in the concrete floor slab are potentially subject to degradation from inside containment (i.e., water on the containment floor seeping through cracks in the concrete floor or past degraded joint sealants). The staff plans on adding specific criteria based on a proposal submitted by NEI on 12/4/00 in GALL Chapter II to address inaccessible steel areas of containments.</p> <p>If any of these criteria cannot be satisfied, then a plant-specific aging management program is recommended to address that aging mechanism for inaccessible areas. The staff plans on revising GALL Chapter II tables to incorporate this additional guidance in all applicable locations.</p>
37	Equipment hatch hinges	---	<p>NEI commented (Comment No. G-IIA3-7) to revise the Aging Mechanism to read “Mechanical Wear of Locks, Hinges and Closure Mechanisms required to maintain the airlock/hatch in the closed position”. At the 12/21/00 staff meeting with NEI, NEI raised a new issue relating to hinges, locks and closure mechanisms: they are active</p>

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			<p>components and consequently are outside the scope of 10 CFR Part 54.</p> <p>Staff Consideration: The staff considers that a passive intended function meeting the criteria of 10 CFR Part 54 exists for locks, hinges, and closure mechanisms on containment airlocks and hatches during normal operation. It is to maintain leak-tight integrity of airlocks and hatches when they are in the closed position. Consequently, the staff plans on revising the wording in GALL Chapter IIA.3 and IIB.4 consistent with NEI's original comment. The staff maintains that these items are within the LR scope. The staff plans on revising GALL to specify that aging management is accomplished by existing programs - Appendix J leak rate testing and plant-specific Technical Specifications. No augmentation or further evaluation is needed.</p>
38	Structural monitoring program	G-III A1-7 G-XI.S5-4	<p>NEI commented (Comment No. G-III A1-7) that either the Structures Monitoring Program (XI.S6) or Masonry Wall Program (XI.S5) may be used to manage aging for masonry walls.</p> <p>Staff Consideration: The staff plans on revising GALL Chapter IIIA as proposed. In addition, guidance on the applicability of the Structures Monitoring Program (XI.S6) for aging management of masonry walls would be added to the Program Description for the Structures Monitoring Program (XI.S6). See discussion below.</p> <p>NEI commented (Comment No. G-XI.S5-4) that the following wording should be used at the end of the Program Description for the Masonry Wall Program (XI.S5):</p> <p><i>"Since the issuance of the IEB 80-11 and IN 87-67, the NRC promulgated 10CFR50.65, the Maintenance Rule. Masonry walls may be inspected as part of the Structures Monitoring Program (XI-S6) conducted for the Maintenance Rule. In</i></p>

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Issue #	Topic	NEI Comment Number	Staff Preliminary Resolution
			<p><i>these cases, the Maintenance Rule evaluation (XI-S6) for license renewal applies and no further explanation is required.</i></p> <p><i>For plants with a separate masonry wall program, the following evaluation and technical basis is provided:"</i></p> <p>NEI's justification is that this would provide for use of an existing Structures Monitoring Program and would also provide a method for using a plant specific program for managing aging of masonry walls.</p> <p>Staff Consideration: The staff plans on incorporating NEI's proposed wording in the Program Description for the Masonry Wall Program (XI.S5), except for the sentence <i>"In these cases, the Maintenance Rule evaluation (XI-S6) for license renewal applies and no further explanation is required."</i></p> <p>To clarify the applicability of the structures monitoring program (XI.S6) to aging management for masonry walls, the staff plans on revising the Program Description for XI.S6 to stipulate that XI.S6 should incorporate the attributes described in XI.S5 when being credited to manage aging of masonry walls. The staff notes that in general a Structures Monitoring Program to meet the Maintenance Rule will not include consideration of seismic II/I as an intended function. This is an intended function for license renewal. Many masonry walls within the scope of license renewal are not automatically in the scope of a Structures Monitoring Program. The applicant must ensure that all masonry walls in the LR scope are included before taking credit for a Structures Monitoring Program.</p>

**NEI Issues on Improved License Renewal Guidance Documents for Management Attention
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Issue #	Topic	NEI Comment Number	Staff Preliminary Resolution
39	Structural monitoring program, Regulatory Guide 1.160, and Appendix B of 10 CFR 50	G-XI.S6-4 G-XI.S6-5 G-XI.S6-6	<p>NEI commented (Comment Nos. G-XI.S6-4, -5, -6) to reword Attributes 7, 8 and 9, respectively to read “The Structures Monitoring Program should be conducted under 10CFR50 Appendix B (Quality Assurance) for Corrective Action [Confirmation] [Administrative Controls], or an existing quality assurance program developed for the Maintenance Rule Program.” NEI’s justification is that Reg. Guide 1.160 Revision 2 recognizes that the Maintenance Rule program includes non-safety related structures and does not require that the licensee develop paper work for BOP to meet the requirements of 10CFR 50 Appendix B requirements.</p> <p>Staff Consideration: The staff considers that non-safety related structures or components that serve an intended function, in accordance with the criteria provided in 10 CFR Part 54, are within the scope of LR. If aging management of these structures and components is accomplished under an applicant’s Structures Monitoring Program, 10 CFR 50 Appendix B applies. In addition, plant-specific QA programs developed for the Maintenance Rule Program cannot be evaluated generically as part of GALL. To reference GALL, attributes (7), (8), and (9) should be addressed by a commitment to 10 CFR Part 50, Appendix B. Alternatively, a license renewal applicant may describe plant-specific approach for addressing these attributes as described in the Appendix to the GALL report.</p>

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Issue #	Topic	NEI Comment Number	Staff Preliminary Resolution
42	Containment dissimilar metal welds	G-IIA3-1	<p>NEI commented (Comment No. G-IIA3-1) to delete the dissimilar metal welds from the Material column. NEI's justification is that 10 CFR 50.55a(b)(x)(C) states that the examination of these items is optional.</p> <p>Staff Consideration: The staff notes that 10 CFR 50.55a does not state that examination of dissimilar metal welds is optional. 10 CFR 50.55a states that IWE Examination Category E-F, which is a surface examination of dissimilar metal welds (e.g., liquid penetrant inspection), is optional. IWE Examination Categories E-A and E-C are also applicable to dissimilar metal welds and are required by 10 CFR 50.55a. The staff is not considering revising GALL Chapter II as suggested by this comment. However, based on discussion with NEI at the 1/30/01 meeting, GALL Chapter II will be revised at all appropriate locations to indicate that IWE Examination Category E-F is optional.</p>

**NEI Issues on Improved License Renewal Guidance Documents for Management Attention
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Issue #	Topic	NEI Comment Number	Staff Preliminary Resolution
43	Spent fuel pool liner water chemistry	G-III A5-1	<p>NEI commented (Comment No. G-III A5-1) to delete the discussion in the Evaluation and Technical Basis column (Aug 2000 draft) and insert the Water Chemistry Program (XI.M11) as the applicable AMP for managing SCC and crevice corrosion for the stainless steel spent fuel pool liner. NEI's justification is that the water chemistry program precludes aging effects by maintaining the spent fuel pool parameters such that degradation would not occur.</p> <p>Staff Consideration: The staff has considered NEI's comment. The Water Chemistry Program (now XI.M2) could be identified as the applicable AMP. However, in addition to the Water Chemistry Program, the staff considers that monitoring of the spent fuel pool water level is also necessary, because reliance solely on control of water chemistry does not manage potential degradation from the concrete side of the spent fuel pool liner. Such degradation has occurred at one plant.</p>
44	Bolting program – IWF not bolting integrity program	G-IIIB1-3	<p>NEI commented (Comment No. G-IIIB1-3) that the program for managing SCC of low-alloy high-strength bolts used in NSSS component supports should be Subsection IWF, not the Bolting Integrity Program. NEI's justification is that the components listed in "Class I Piping and Component Supports" are within the scope of IWF, which has been found to be acceptable for managing this aging effect in NUREG-1723.</p> <p>Staff Consideration: The staff plans to be consistent with NEI Open Issue # 6 "Bolting - Loss of Preload and Cyclic Loading SCC".</p>
45	Eliminate A-46 – scope, acceptance	G-XI.S5-1 G-XI.S5-5	<p>NEI commented (Comment No. G-XI.S5-1) the deletion of references to the USI A-46 program in Attributes 1 and 6 of the Evaluation and Technical Basis for XI.S5 and to replace with references to masonry walls within the scope of license renewal.</p>

**NEI Issues on Improved License Renewal Guidance Documents for Management Attention
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Issue #	Topic	NEI Comment Number	Staff Preliminary Resolution
	criteria		<p>NEI's justification is that reference to A-46 program is inappropriate because the evaluation of masonry walls is not a defined element of the USI A-46 program. The appropriate reference is to "those masonry walls within the scope of license renewal".</p> <p>Staff Consideration: The staff notes that any masonry walls identified and evaluated during the USI A-46 program that have an intended function consistent with the criteria of 10 CFR Part 54 must be included in the scope of license renewal. For example, masonry walls that serve a fire barrier function necessary to meet 10 CFR 50.48 are also within the scope of license renewal. The purpose of the reference to the USI A-46 program was to alert applicants and reviewers that these masonry walls may be included in the license renewal scope.</p> <p>At the meeting with NEI on 1/30/01, NEI pointed out that this is a scoping issue and it is not appropriate to address LR scope in GALL. The staff considered NEI's position and subsequently concluded that this would be more appropriately addressed in SRP 2.4 on scoping. Consequently, in SRP Section 2.4.3.2 "Structural Components Subject to an Aging Management Review" of SRP-LR, Chapter 2, the staff plans to add the following sentences: "Another example, if a non-safety-related structure or component is included in the plant's CLB as a part of the safe shutdown path resulting from the resolution of USI-A-46, the reviewer should verify that this structure or component has been included within the scope of license renewal." In addition, GALL XI.S5 Attribute (1) will be revised to delete the parenthetical phrase; reference to A-46 will be deleted in XI.S5 Attribute (6); and XI.S5 Attribute (10) will be revised to incorporate NEI's proposal to include IEB 80-11, USI A-46, and MR inspection in the discussion of operating experience.</p>

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Issue #	Topic	NEI Comment Number	Staff Preliminary Resolution
			<p>NEI commented (Comment No. G-XI.S5-5) to replace the Aug 2000 draft version of the Masonry Wall Program (XI.S5) with the following:</p> <p>Scope of Program: The scope of the program includes those masonry walls within the scope of license renewal. (Justification: There is no need to include USI A-46 program here. It is addressed in Operating Experience.)</p> <p>Preventive Actions: No specific preventive actions are required. (Justification: The program is a visual inspection and no preventive actions are identified. The staff has found this acceptable.)</p> <p>Parameters Monitored/Inspected: Visual inspection by a qualified individual is sufficient to identify cracking of masonry walls. (Justification: Cracking is the primary parameter.)</p> <p>Detection: A visual inspection performed using the guidance of IEB 80-11 and IN 87-67 provides reasonable assurance that the aging effect of cracking will be identified prior to loss of the component intended function. (Justification: Frequency does not need to be specified here. Frequency is per the current licensing basis.)</p> <p>Monitoring and Trending: There is no monitoring and trending processes associated with this program. (Justification: The NRC staff has found this acceptable.)</p> <p>Acceptance Criteria: Acceptance criteria are no visual indication of cracking of masonry walls, which would invalidate the evaluation basis in response to IEB 80-11. (Justification: Do not expand criteria previously established.)</p> <p>(10) Operating Experience: Incorporation of lessons learned from the implementation of IE Bulletin 80-11, USI A-46, and the MR Inspection should assure the structural integrity of all masonry walls important to safety are adequately managed. This should ensure the structural integrity of the masonry walls within the scope of license renewal is adequately managed for the period of extended operation.</p>

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Issue #	Topic	NEI Comment Number	Staff Preliminary Resolution
			<p>Delete Note. (Justification: Note has been incorporated in text above in Introduction.)</p> <p>Staff Consideration: This NEI proposal had been previously submitted in March 2000. It was not incorporated into the August 2000 draft of GALL, because the staff considered the proposal lacked the level of detail needed to clearly define the attributes of an acceptable AMP for masonry walls. The staff does not plan to revise XI.S5 based on this comment.</p>
46	Vibration of supports and cyclic induced cracking – location in GALL	G-IIIB1-2	<p>NEI commented (Comment No. G-IIIB1-2) that vibration and cyclic induced cracking is not a license renewal aging effect and should be deleted.</p> <p>NEI's justification is that cracking due to vibratory loads and cyclic loading is not an aging effect requiring management for the period of extended operation. For components that may be subjected to vibratory or cyclic loading, proper design eliminates or compensates for vibration and cyclic loading. In addition, vibration characteristically leads to cracking in a short period of time, on the order of hours to days of operation. For example, a component with 1 Hertz vibratory load will be subject to 10^7 cycles in four months of service, so that failure, should it occur, is probable early in life for vibratory stresses above the endurance limit. Because this time period is short when compared to the overall plant operational life, any cracking will be identified and corrected to prevent recurrence long before the period of extended operation. This type of degradation is limited to a small set of components and is corrected as discovered with inspections of similar locations and configurations to ensure the event is location specific or a one-time event.</p> <p>Staff Consideration: The staff has considered that cracks in steel elements of</p>

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(Based on 12/21/00 and 1/30/01 Public Meetings with NEI)**

Issue #	Topic	NEI Comment Number	Staff Preliminary Resolution
			<p>component supports caused by vibratory stresses above the material endurance limit would develop in a matter of hours or days. This time frame is not consistent with the requirements of the License Renewal Rule, which address slow aging processes affected by extended operation.</p> <p>The staff has also considered that the potential for cracking induced by other cyclic loads, such as thermal cycling of the supported system, is implicitly considered in structural steel design through the specification of conservative design allowable stresses that account for a minimum of 10⁵ load cycles.</p> <p>However, the staff has concern that concrete located around expansion, undercut or embedded anchors for component supports is susceptible to cracking as a result of service-induced loads on the supports. This could result in reduced capacity of the support anchorage and consequential failure of the anchorage during a design-basis event (e.g., earthquake). The staff considers that maintaining sound conditions in the concrete around support anchors is critical to the intended function of the support and requires aging management. The staff considers the Structures Monitoring Program the applicable AMP.</p> <p>At the 1/30/01 meeting, the staff agreed to re-evaluate its current conclusions based on additional review of plant operating experience and NRC-sponsored testing of concrete anchor capacities when cracking is present. Based on this review, the staff concluded that concrete cracking is significant for expansion anchors and grouted anchors, but not for cast-in-place anchors and undercut anchors. The staff plans on revising GALL to reflect this conclusion.</p>

**NEI Issues on Improved License Renewal Guidance Documents for Management Attention
(Based on 12/21/00 and 1/30/01 Public Meetings with NEI)**

Issue #	Topic	NEI Comment Number	Staff Preliminary Resolution
16b	Wear/loss of material – no operating experience	G-VII-G-8	<p>NEI commented that entries for Wear in the fire rated doors in Section G of Chapter VII should be deleted because the degradation is insignificant.</p> <p>The staff considers that fire rated doors are mostly checked for function and less often for degradation such as (clearance tests, worn hinges, latch). Failures may provide a path for the spread of fire or fire products (smoke and heat) beyond a single fire area. The term “insignificant” does not imply that the intended function will not be affected over a period of time. Operating experience is discussed in the Oconee LRA (page 4.16-3) and the Oconee SER (page 3-35). On page 4.16-3 (Section 4.16.1.2, operating experience) of Oconee LRA, it states “Previous inspection of the fire doors have identified wear of the hinges and handles.”</p>
61	SECY 96-146 on fire barrier	G-VII-G-4	<p>NEI commented that no aging effects should be identified for penetration seals according to SECY-96-146.</p> <p>The staff considers that in NUREG-1552, “Fire Barrier Penetration Seals in Nuclear Power Plants,” (which incorporates the findings from SECY-96-146) it discusses how some shrinkage is normal and acceptable for fire protection based on Dow Corning guidelines, which is a major manufacturer of silicone-based materials. The staff concluded that <i>normal</i> shrinkage does not have a significant impact on the function and capabilities of silicone foam or elastomer as a fire barrier penetration seal material. However, shrinkage could be considered abnormal if it exceeds what is acceptable for fire protection purposes. Furthermore, the AMP is specifically designed to look at several aging effects; including abnormal shrinkage, which could lead to cracking and separation of seals. In addition, the staff did not conclude in SECY-96-146 that abnormal shrinkage and aging could <i>never</i> occur in the future as plants operate beyond 40 years.</p> <p>All previous license renewal applicants have taken credit for programs to manage</p>

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			aging of penetration seals in their aging management programs. Programs currently inspect up to 10% of each type of seal each refueling outage and only expand the inspection scope beyond 10% if they detect age related degradation of penetration seals. These programs are consistent with the requirements of GALL.
62	NFPA commitments	G-XI-M10-2	<p>NEI commented that meeting applicable NFPA commitments and the additional internal inspections of system components when disassembled along with maintaining the system at normal operating pressure provide the assurance that the system intended functions are maintained.</p> <p>The staff considers that the NFPA codes alone are not sufficient to detect MIC, corrosion, or fouling in water-based fire suppression systems prior to a loss of the intended function.</p> <p>NFPA does not have a license renewal rule (like the NRC does), which states that programs should manage the effects of aging prior to the loss of the intended function. The programs in NFPA are <i>minimum requirements</i> that do not focus on the detection of aging effects prior to loss of the intended function, as our license renewal rule states. It clearly states in the NFPA codes that the AHJ, which in this case is the NRC, has the authority to modify the code based on the concern/hazard. In this case, the NRC has the authority to enhance the guidance contained in NFPA.</p> <p>The staff is considering revising GALL to recommend internal inspections for portions of piping to ensure that corrosion, MIC, fouling have not caused significant wall thinning and guidance to ensure sprinkler head operability throughout the period of extended operation. The revised program description would read: In addition to NFPA codes and standards, which do not currently contain programs to manage aging, portions of the fire protection sprinkler system, which are not routinely subjected to flow, need to be subjected to full flow tests at the maximum</p>

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Issue #	Topic	NEI Comment Number	Staff Preliminary Resolution
			<p>design flow and pressure before the period of extended operation (and at 10-year intervals thereafter). In addition, a sample of sprinkler heads should be inspected by using the guidance of NFPA 25, Section 2.3.3.1. This NFPA section states "where sprinklers have been in place for 50 years, they shall be replaced or representative samples from one or more sample areas shall be submitted to a recognized testing laboratory for field service testing." It also contains guidance to perform this sampling every 10 years after the initial field service testing. Finally, portions of fire protection suppression piping located aboveground and exposed to water also need to be disassembled and visually inspected internally once every refueling outage. The purpose of the full flow testing and internal visual inspections is to insure that corrosion, MIC, or biofouling aging effects are managed such that the system function is maintained.</p> <p>Element 10 may also be modified to remove the reference to at least 80 years. This element would state, "Water-based fire protection systems designed, inspected, tested, and maintained in accordance with NFPA standards have demonstrated reliable performance."</p>

From: Samson Lee
To: internet: DJW@NEI.ORG
Date: Fri, Feb 9, 2001 8:36 AM
Subject: Follow-up items on 1/25 and 30/01 meetings

Doug:

Please replace our follow-up items from the 1/25 and 1/30/01 meetings on GALL/SRP items 26 and 62 with the attached. We plan on attaching this to the 1/25 and 30/01 meeting summaries. We have no follow-up items from the 1/31/01 meeting.

Thanks,
Sam

CC: Christopher Grimes, Kar1, Pao-Tsin Kuo

Issue Number/Title	Meeting conclusion or action item	Proposed action item resolution or conclusion from action item.
26 Biofouling – preventing intended function	<p>Actions are the same as item 25, NRC will discuss at Chris' meeting on January 31, 2001. Staff to investigate flow blockage as an issue.</p>	<p>NRC considers that biofouling affects both system flow performance and pressure boundary integrity. Flow performance is considered an active function covered under the current licensing basis and should not be included within the scope of license renewal. However, biofouling causes loss of material, which affects the pressure boundary and this passive function requires aging management.</p> <p>NRC proposes the following changes to the GALL report:</p> <ol style="list-style-type: none"> 1. For all piping and components, the GALL report could be revised to delete all line items for buildup of deposits due to biofouling. 2. Loss of material due to biofouling could be included as an aging effect for piping and pressure boundary components. 3. The aging management program XI.M20 "Open-Cycle Cooling Water System," XI.M26 "Fire Protection," and XI.M27 "Fire Water System" could be revised to remove reference to flow blockage and to clarify the aging effect to be managed is loss of material.
62 NFPA commitments - full flow testing	<p>Actions are the same as item 25, NRC will discuss at Chris' meeting on January 31, 2001. Staff to investigate flow blockage as an issue.</p>	<p>See Issue 26 concerning flow as a performance issue and pressure boundary integrity.</p> <p>Staff considers that the NFPA codes alone are not sufficient to detect MIC, corrosion, or fouling in water-based fire suppression systems prior to a loss of the intended function. NFPA does not have a license renewal rule (like the NRC does), which states that programs should manage the effects of aging prior to the loss of the intended function. The programs in NFPA are minimum requirements that do not focus on the detection of aging effects prior to loss of the intended function, as our license renewal rule states. It clearly states in the NFPA codes that the AHF, which in this case is the NRC, has the authority to modify the code based on</p>

Issue Number/Title	Meeting conclusion or action item	Proposed action item resolution or conclusion from action item.
		<p>the concern/hazard. In this case, the NRC has the authority to enhance the guidance contained in NFPA.</p> <p>The staff is considering revising GALL to recommend internal inspections for portions of piping to ensure that corrosion, MIC, fouling have not caused significant wall thinning and to ensure sprinkler head operability throughout the period of extended operation. The revised program description would read: In addition to NFPA codes and standards, which do not currently contain programs routinely subjected to flow, need to be subjected to full flow tests at the maximum design flow and pressure before the period of extended operation (and at 10-year intervals thereafter). In addition, a sample of sprinkler heads should be inspected by using the guidance of NFPA 25, Section 2.3.3.1. This NFPA section states "where sprinklers have been in place for 50 years, they shall be replaced or representative samples from one or more sample areas shall be submitted to a recognized testing laboratory for field service testing." It also contains guidance to perform this sampling test every 10 years after the initial field service testing. Finally, portions of fire protection suppression piping located aboveground and exposed to water also need to be disassembled and visually inspected internally once every refueling outage. The purpose of the full flow testing and internal visual inspections is to ensure that corrosion, MIC, or biofouling aging effects are managed such that the system function is maintained. Element 10 may also be modified to remove the reference to at least 80 years. This element would state, "Water-based fire protection systems designed, inspected, tested, and maintained in accordance with NFPA standards have demonstrated reliable performance."</p>