From: Jerry Dozier
To: internet: djw@nei.org
Date: Wed, Jan 17, 2001 4:52 PM
Subject: Outline for meeting on January 25th for Mechanical open items escalated to management

Doug,

The attached is a preliminary handout for the January 25th meeting to discuss open mechanical GALL/SRP issues. This listing provides the staffs preliminary resolution to the issues.

Have a Great Day!

Jerry Dozier

I. Jerry Dozier
US Nuclear Regulatory Commission
One White Flint North, MS 012G15
11555 Rockville Pike
Rockville, MD 20852
(301) 415-1014

CC: Christopher Grimes, David Solorio, Edmund Kleeh,...

NEI Issues on Improved License Renewal Guidance Documents for Management Attention (Based on 12/21/00 Public Meeting)			
Issue #	**Issue**	**NEI Comment Number**	**Staff Preliminary Resolution**
1	Adequacy of chemistry program – need for one-time inspection	G-V-D2-1 G-VIII-D1-1 G-VIII-D1-3 G-VIII-E-8 G-VIII-E-9 G-VIII-E-10 G-VIII-F-1	NEI commented that a one-time inspection should not be necessary when a water chemistry control program is in place. The staff recommends the one-time inspection to address aging effects, like loss of material, in systems with carbon steel components and which experience low-flow or stagnant conditions. In those cases the water chemistry programs utilized in the primary and secondary systems may not fully mitigate aging mechanisms like general, crevice, and pitting corrosions. The GALL report utilizes the one-time inspection as the means to verify the absence of an aging effect when there is insufficient data to prove otherwise or to verify that an aging effect is progressing slowly so that it has an insignificant effect on a component's intended function. An acceptable verification program may consist of a one-time inspection of selected components and/or at susceptible locations in the system. An alternative acceptable program may include routine maintenance or a review of repair records to confirm that significant aging degradation has not occurred verifying the effectiveness of existing AMPs. One-time inspection, or any other action or program, would be developed and reviewed on a plant-specific basis. Staff is considering to provide in GALL a more definitive understanding as to the meaning and nature of a one-time inspection

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2	Small bore piping – need for one-time inspection	G-IV-3 G-IV-C2-4	NEI commented that a one-time inspection should not be necessary for small-bore piping when reactor coolant chemistry programs and plant detection systems are in place. Operating experience demonstrates that small-bore piping has an aging effect that requires managing in the extended term. GALL recommends that a plant-specific destructive examination or a nondestructive examination (NDE) that permit inspection of the inside surfaces of the piping needs to be conducted. For Class 1 piping with a diameter smaller than nominal pipe size (NPS) 4 inch, gall recommends the one-time inspection be performed to confirm whether crack initiation and growth due to stress corrosion cracking (SCC) or cyclic loading is occurring or not. This one-time inspection can also verify the effectiveness of the chemistry program.

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3	Adequacy of fuel oil program – need for one-time inspection	G-VII-H1-4 G-VII-H2-8 G-XI-M9-4	NEI commented that a one-time inspection and cleaning/draining of tanks are not necessary when fuel oil chemistry and plant monitoring and maintenance are in place. GALL recommends a one-time inspection because corrosion may occur at locations in which contaminants may accumulate, such as tank bottoms. There is a need for verification of effectiveness of the program to ensure that significant degradation is not occurring and the component intended function would be maintained during the extended period of operation. Cleaning and draining of tanks allows removal of sediments and water collected at the bottom of a tank, which minimizes the amount of water and the length of contact time.
4	Program for buried pipe and components	G-XI-M8-1 G-VII-C1-7 G-VII-H1-2	NEI commented that the AMP for Buried Piping and Tanks be deleted and replaced with a plant specific evaluation. The GALL report indicates that although the Buried Piping and Tanks AMP (based on NACE standards) is not an existing nuclear industry standard practice, it is one acceptable method. Based on the review of license renewal applications, the staff is considering to provide an alternative in the AMP to inspect based on the frequency for the need to dig up piping considering plant operating experience that would allow for crediting the inspection when a pipe is dug up for any reason. The frequency and plant operating experience could be subject to a plant specific review.
5	Threshold for neutron fluence in reactor vessel and internals	G-IV-4 G-IV-A2-18 G-IV-B2-2 G-IV-B2-3 G-IV-B2-8	NEI commented that the threshold be increased to 10E21. The staff considers that the threshold or trigger value should not be changed to 10E21 as NEI commented because of the lack of data to support this value as a threshold. The GALL recommendation is that the most susceptible locations should

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	(10E17)	G-IV-B2-13 G-IV-B2-15 G-IV-B2-16 G-IV-B2-17 G-IV-B2-18 G-IV-B2-19 G-IV-B3-1 through G-IV-B3-14 G-IV-B4-3 G-IV-B4-4 G-IV-B4-6	be monitored and inspected and it is not necessary to identify all locations exceeding 10E17. For the vessel, the threshold must stay at 10E17 to be consistent with 10CFR50 Appendix H. As recommended in NEI comment GIVB3-17, the staff is considering revising GALL by recommending use of an enhanced VT-1 to detect tight cracks in non-bolted applications. Then, no further evaluation will be required for these components. This option is for SCC/IASCC and neutron embrittlement and further evaluation is being considered to change to "no". Specifically, the staff is considering developing a new program in GALL chapter XI to articulate this approach. The program includes (a) augmentation of the inservice inspection (ISI) in accordance with the American Society of Mechanical Engineers (ASME) Code, Section XI, Subsection IWB, Table IWB 2500-1 (1995 edition through the 1996 addenda, or later edition as approved in 10 CFR 50.55a) for certain susceptible or limiting components or locations, and (b) monitoring and control of reactor coolant water chemistry in accordance with the EPRI guidelines in TR-105714 to ensure the long-term integrity and safe operation of pressurized water reactor (PWR) vessel internal components. Augmentation of the ASME Section XI ISI includes enhanced VT-1 examinations of non-bolted components, and other demonstrated acceptable methods for bolted components. The inspection methods for bolted components must be submitted for the NRC staff review beginning of the license renewal period. The program is focused on managing the effects of crack initiation and growth due to stress corrosion cracking (SCC) or irradiation assisted stress corrosion cracking (IASCC), and loss of fracture toughness due to neutron irradiation embrittlement or void swelling. The program contains preventive measures to mitigate SCC or IASCC; ISI to monitor the effects of cracking on the intended function of the

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			components; and repair and/or replacement as needed to maintain the ability to perform the intended function. Loss of fracture toughness is of consequence only if cracks exist. Cracking is expected to initiate at the surface and should be detectable by augmented inspection. The program provides guidelines to assure safety function integrity of the subject safety-related reactor pressure vessel internal components, both non-bolted and bolted components. The program consists of the following elements: (a) identify the most susceptible or limiting items, (b) develop appropriate inspection techniques to permit detection and characterizing of the feature (cracks) of interest and demonstrate the effectiveness of the proposed technique, and (c) implement the inspection during the license renewal term. For non-bolted components, this program recommends enhanced visual VT-1 examinations. For bolted components, this program recommends other demonstrated acceptable inspection methods; these methods must be submitted for the NRC staff review beginning of the license renewal period.

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6	Bolting – loss of pre-load and cyclic loading SCC	G-V-E-7 G-VII-I-6 G-VII-I-7 G-VIII-H-6 G-VIII-H-7	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. The staff is considering to remove that loss of preload would result in leakage before catastrophic failure could occur and loss of preload due to stress relaxation from GALL. However, 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.

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7	Closure bolting – separate component	G-V-A-2 G-VII-I-1 G-VII-I-5 G-VIII-H-1 G-VIII-H-5 G-XI-M12-1 G-XI-M12-2 G-XI-M12-4	NEI commented that all bolting should be included in the Carbon Steel Components section of chapters V, VII, and VIII, not called out separately throughout the chapters, and the AMP should be the Boric Acid Corrosion, not Bolting Integrity. The staff considers that bolting is an integral part of piping, fittings and miscellaneous related items, pumps, valves, and heat exchangers in the PWR containment spray system. Bolting is considered to be a system component for each individual engineered safety features system because it can be uniquely identified and also because it is a small component whose review could be missed if categorized under a broader category. ASME Section XI treats individual bolting as a component and requires inspection of individual bolting. Closure bolting in this environment is susceptible to general corrosion resulting in loss of material. The Bolting Integrity AMP manages this aging process, not Boric Acid Corrosion.
8	Boric acid corrosion program – removing ISI	G-XI-M5-2 G-IV-A2-2 G-VII-A3-1 G-VII-E1-10 G-VII-I-2 G-VIII-H-2	NEI commented to delete reference to ASME section XI in program description for the Boric Acid Corrosion program. The staff considers that the Boric Acid Corrosion program in the GALL report, which relies on implementation of Nuclear Regulatory Commission Generic Letter 88-05, provides a stand-alone program for inspection of carbon steel structures and components for evidence of boric acid leakage and corrosion. Inservice inspection that detects leakage identified during the performance of pressure tests and hydrostatic tests are required by the ASME Code and are performed independent of the Boric Acid Corrosion program and may be removed.

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9	Vessel flange leak detection line	G-IV-A2-5 G-IV-A2-6	NEI commented that the Vessel flange leak detection line be removed from GALL. The vessel flange leak detection line has the LR function of pressure boundary in some plants and has been included in earlier LR applications. Even though this component may not be in scope at some plants, the GALL report should be generic and accommodate those plants that have this component in scope.
10	Program for carbon steel tanks	G-XI-M7-1	NEI proposed to delete aging management program for "Above Ground Carbon Steel Tanks" and replace with a plant specific program. See issue #3.
11	BWRVIP-74, vessel welds	G-IV-A1-3	The staff is considering to revise the GALL report to address the comment: (1) The words "and axial reactor vessel welds" will be deleted from "a)", and (2) the words "circumferential and" will be deleted from "d)". The item d) is not deleted in its entirety because the impact of neutron embrittlement on probability of failure of axial welds at the end of license renewal term needs to be evaluated to ensure that the vessel has not been embrittled beyond the basis for the staff and BWRVIP analyses. An option is being considered for the applicant to demonstrate that the adjusted reference temperature is below the temperature specified in the staff's SER on BWRVIP-74. This issue is an integrity issue rather than an inspection issue.

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12	SRP 4.2.2.1.5 and 4.2.3.1.5 – BWRVIP, vessel welds	S4.2-2	NEI commented that these sections should be deleted from the SRP. NEI provides the following justification for its recommendation. "The BWRVIP analysis referred to was to demonstrate the difference between the axial and circumferential welds in a BWR vessel for the purpose of eliminating circumferential weld examinations. The fluence experienced by BWRs is significantly less than PWRs and does not pose a threat to the integrity of the reactor vessel." However, according to 10CFR part 54, the analyses must be performed for a 60-year period and not for 40-year period. Therefore, these sections are required for staff's review.

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13	Bottom head and pressurizer penetrations	G-IV-5	NEI commented that Chapter IV of the GALL report should be revised to eliminate the augmented program requirements for bottom head instrumentation tubes (Item A2.7.1), the vessel head vent pipe (Item A2.7.2), pressurizer instrument penetrations (Item C2.5.6), and pressurizer heater sheaths and sleeves (Item C2.5.10). The staff is considering to revise the GALL report to eliminate a need for augmented program (plant specific program) 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. An AMP similar to the one for Item A2.2.1 (Control Rod Drive Head Penetration) may be specified for Items A2.7.2 and A2.7.3. For bottom head instrumentation tubes (Item A2.7.1), the vessel head vent pipe (Item A2.7.2), pressurizer instrument penetrations (Item C2.5.6), and pressurizer heater sheaths and sleeves (Item C2.5.10) credit may be given for the reactor coolant water chemistry program and its combination with ASME Section XI. Examination Category B-P visual (VT-2) inspections. Considering that the CRDM nozzles are lead indicators of potential PWSCC, and considering the lower level of risk associated with leakage from Ni-Fe-Cr components other than the CRDM nozzles, the combination of water chemistry control and Examination Category B-P inspections may be found to be adequate for the bottom head.

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14	GE RICSIL 055 program not needed	G-IV-A1-2	NEI commented that the GE RICSIL 055 program is not needed. While the RICSIL is a tool that can be used by an owner to manage cracking, it is not required by GALL. The ASME Section XI ISI examinations are adequate to manage the aging effects of cracking. The staff is considering revising the program description to delete reference to the RICSIL.
15	Reg Guide 1.65 on material selection	G-IV-A2-3	NEI recommends that Reg Guide 1.65 design requirements be removed from GALL. The staff is considering removing the design requirements of Reg Guide 1.65 from GALL because design requirements are not an aging management program. Preventive maintenance features of Reg Guide 1.65 are a CLB requirement and will continue into the extended period. Preventive measures of RG 1.65 such as the use of acceptable surface treatments and stable lubricants are presented in GALL. These mitigation measures are an effective option for reducing SCC or IGSCC, for the AMP to be effective.
16a	Wear/loss of material – no operating experience	G-IV-A2-33 G-VII-G-8	Regarding the NEI comment G-IV-A2-33 (16A), which affects the core support pads (Item IV A2.6 in GALL); there is insufficient relative motion between the pad and adjacent parts to generate degradation. Wear/loss of material for this component is unlikely. Thus, the staff is considering removing this aging effect from GALL. **The NEI comment G-VII-G-8 (16B) will be discussed in the structures meeting.**

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17	SCC – removing ISI	G-IV-B3-15	See issue number 5. The issue for removing ISI and crediting chemistry alone requires further justification by NEI. ISI is needed to monitor the effects of cracking on the intended function of the components; and repair and/or replacement as needed to maintain the ability of the component to perform the intended function. Cracking is expected to initiate at the surface and should be detectable by ISI and augmented inspection. As recommended in NEI comment GIVB3-17, The staff is considering revising GALL by recommending use of an enhanced VT-1 to detect tight cracks in non-bolted applications. Then no further evaluation may be required for these components. This option was given for SCC/IASCC and neutron embrittlement and further evaluation was changed to "no". The program consists of the following elements: (a) identify the most susceptible or limiting items, (b) develop appropriate inspection techniques to permit detection and characterizing of the feature (cracks) of interest and demonstrate the effectiveness of the proposed technique, and (c) implement the inspection during the license renewal term. For non-bolted components, this program recommends enhanced VT-1 examinations. For bolted components, this program recommends other demonstrated acceptable inspection methods; these methods must be submitted for the NRC staff review beginning of the license renewal period.
18	SCC and water chemistry	G-IV-B2-4	NEI commented that Water Chemistry is sufficient without crediting ISI. Same as issue number 5 and 17

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19	SCC in containment spray	G-V-A-3	NEI does not believe that stress corrosion cracking (SCC) can occur in a system like ECCS because it is in a standby mode the majority of the time and typical ambient temperatures in that mode are less than 150 degrees Fahrenheit which is the minimum threshold temperature for which SCC is likely to occur. The staff believes that SCC is probable under the stated conditions because of the possible introduction of contaminants from either an open spent fuel pool or the purchase of boron containing contaminants above a prescribed amount based on operating experience.
20	SCC in standby liquid control	G-VII-E2-8	NEI commented that all entries for SCC in stainless steel components in Section E2 of Chapter VII of GALL should be deleted. The staff considers that even at lower temperatures of 21-32ºC (70-90ºF), stainless steel is subject to pitting and crevice corrosion in the presence of impurities. There have been instances of failures in spent fuel pool cleanup systems. Cracking instances in piping in PWRs were studied in NUREG-0691 (1980). Affected systems included piping from the borated water storage tank to the RHR suction, spent fuel cooling piping, etc. Additionally, IGSCC was observed in PWR safety injection accumulator nozzles (NRC IN 91-05). The above operating experience in PWRs is applicable to the standby liquid control system (BWR) because the sodium pentaborate solution provides a borated environment comparable to that found in PWRs. The objective evidence on SCC/IGSCC as discussed above and documented in NUREG-0691 (1980) and IN 91-05 are therefore applicable.

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21	PWSCC of core support lugs	G-IV-A2-27	The staff is considering to revise GALL to identify PWSCC as an aging mechanism for PWR alloy 600 components exposed to reactor coolant as suggested by the NEI comment. This change may be made throughout GALL. The corresponding aging management program may be plant-specific program (as recommended by NEI comment G-IVA2-28) because there is no generic alloy-600 program approved by NRC except for alloy-600 reactor vessel head penetrations. The NEI recommendation for the appropriate AMP to be ASME Section XI, Examination Category B-N-2 is inconsistent with NEI comment G-IVA2-28. The staff is considering incorporating NEI comment G-IVA2-28 as recommended by NEI.
22	Delta ferrite limit for cast stainless steel – 25% vs. 40%	G-IV-7 G-XI-M1	NEI commented that the 25 % limit on delta ferrite for which the comparison of SAW crack growth resistance is comparable to thermally aged CASS should be reassessed. Response: The GALL report recommends that flaw evaluation for components with >25% ferrite is performed on a case-by-case basis by using fracture toughness data provided by the applicant. Extensive research data indicate that the lower-bound fracture toughness of thermally aged CASS material with up to 25% ferrite is similar to that for SAWs with up to 20% ferrite (Lee et al., Intl. J. Pres. Ves. & Piping, 72, 37-44, 1997). Fracture toughness data for CASS materials with 25-35% ferrite are available in the following papers: 1. Jayet-Gendrot, Ould, and Balladon, Fontevraud III, 90-97, 1994. 2. Jayet-Gendrot, Ould, and Meylogan, Nucl. Eng. & Des., 184, 3-11, 1998. 3. Jayet-Gendrot, Ould, and Meylogan, PVP Vol-304, 163-169, 1996. These results clearly show that the fracture toughness J-R curves for CASS materials with 25-35% ferrite are lower than that for SAW.

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			NEI commented that Chapter IV and XI should be revised to recognize that the limiting base metal for CASS piping thermal aging embrittlement effects may be the 0.5-inch of base metal on either side of welds inspected in accordance with the ASME Code Section XI Examination Category B-J. The GALL report recommends the AMP described in the letter from Grimes to Walters, License Renewal Issue No. 98-0030, May 19, 2000. The AMP recommends inspection of the limiting base metal of CASS components. For thermal embrittlement of potentially susceptible piping, the AMP provides for volumetric examination of the base metal, with the scope of the inspection covering the portions determined to be limiting from the standpoint of applied stress, operating time, and environmental conditions. For thermal and neutron embrittlement of susceptible components, the AMP includes a supplemental inspection covering portions of the susceptible components determined to be limiting from the standpoint of thermal aging susceptibility (i.e., ferrite and molybdenum contents, casting process, and operating temperature), neutron fluence, and cracking susceptibility (i.e., applied stress, operating temperature, and environmental conditions). The applicant has the option to demonstrate that the 0.5-inch of base metal on either side of the welds is limiting.

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23	Aging of stainless steel in borated water	G-VII-A3-3	NEI commented that stainless steel should be deleted as a material for this component. The staff considered that stainless steel is subject to pitting and crevice corrosion in the presence of impurities. There have been instances of failures in spent fuel pool cleanup systems. Cracking instances in piping in PWRs were studied in NUREG-0691 (1980). Affected systems included piping from the borated water storage tank to the RHR suction, spent fuel cooling piping, etc. Additionally, IGSCC was observed in PWR safety injection accumulator nozzles (NRC IN 91-05).

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24	All carbon steel components should be in Subsection I of GALL	G-VII-A3-6	NEI commented deleting all carbon steel components in spent fuel pool cooling and cleanup (PWR). The staff position considers clarifying the write up in the August version of GALL. The components in the spent fuel pool cooling and cleanup (PWR) contain chemically treated borated water, which may leak out of them. The components in the carbon steel components section have chemically treated borated water leaking onto them. The staff considered revising GALL by adding a phrase both in the system structure and component description as well as in the table itself of the carbon steel components section. This would be added to clarify that the carbon steel components considered do not contain borated water: (1) Replace the first paragraph on p. VII I-4 with the following paragraph. System, Structures, and Components This table includes the aging management programs for the external surfaces of all carbon steel structures and components including closure bolting in the Auxiliary Systems in pressurized water reactors (PWRs) and boiling water reactors (BWRs). For the carbon steel components in PWRs, this table addresses only boric acid corrosion of external surface as a result of the dripping borated coolant water that is leaking from an adjacent PWR component. Boric acid corrosion can also occur for carbon steel components containing borated water due to leaking; these components and aging management programs are covered in the appropriate major plant sections of this chapter. (2) Revise the Environment Column in the first row on p. VII I-3 as follows. Air, leaking and dripping chemically treated borated water up to 340ºC (644ºF)

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25	Buildup of deposit/flow blockage – impact on heat transfer	G-VII-C1-8 G-VIII-F-2	Regarding the NEI comment G-VIII-F-2, NEI commented that buildup of deposits due to biofouling is an aging effect which impacts heat transfer intended function and affects only the heat exchanger tubes. Buildup of deposit does not affect pressure boundary components, except for MIC, which is addressed under loss of material. The staff considers that buildup of deposits only affects the heat transfer capability and does not affect pressure boundary components of the heat exchanger. 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. This item also applies to the Condensate System heat exchanger in chapter VIII. This item also applies to all heat exchangers in Ch. V, VII and VIII of GALL that are serviced by open cycle cooling water. However, regarding the NEI comment G-VII-C1-8, which affects piping, valves, flow orifice, pump, and basket strainer (VII C1.1.1, C1.2.1, C1.4.1, C1.5.1, C1.6.1) in the open cycle cooling water system, buildup of deposit due to biofouling will affect the intended functions of these components, e.g., supplying water to other systems such as fire protection system and fire water system. (Biofouling would block water supply.) The staff is not considering deleting these rows in the GALL report.

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26	Biofouling – preventing intended function	G-VII-G-9 G-VII-H1-6 G-VII-H2-11 G-VIII-G-4	NEI commented to delete entries for biofouling for these components. The staff considers that the piping, fittings and miscellaneous components are exposed to raw, untreated salt water or fresh water. Therefore the components are susceptible to biofouling. Biofouling can lead to flow blockage and the facilitation of flow can be considered an intended function.
27	Boraflex visual inspection and "Badger" code	G-VII-A2-4	NEI commented to eliminate the GALL recommendation for both visual inspection of the coupons and the BADGER device inspection. The staff considers that the visual inspection and the areal density measurements from BADGER are complementary and both are necessary. Visual inspection of samples gives qualitative results of the actual plates. It gives indications of the cause of the physical degradation (e.g., cracking). The BADGER device gives quantitative results of the areal density.
28	Lubricating oil environment	G-VII-G-10	NEI commented to delete all entries for lubricating oil environments. The staff considers that corrosion is a plausible mechanism with lubricating oil and contaminant for the components (tank, piping, tubing, valve body) in the reactor coolant pump oil collection system. This has been addressed in the Oconee LRA (Vol II, page 3.5-11 to 3.5-14: Table 3.5-9, Vol II, page 3.5-135) and the ONS License Renewal SER (page 3-149 to 150). For clarification, The staff is considering to revise the GALL report to replace "lubricating oil" in the environment column with "lubricating oil (with contaminants and/or moisture)."

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29	Fuel oil environment in fuel oil strainer	G-VII-H2-15	NEI commented to delete the entry for the strainer in the diesel engine fuel oil subsystem. The staff considers that the fuel oil strainer is not in an environment where there is a potential for water to pool or separate. Corrosion as a mechanism should not be considered. The staff is considering revising GALL to delete this entry.
30	Temperature for aging mechanism to occur (lower limit 25ºC to 93ºC)	G-V-D2-2 G-VII-E2-3	NEI commented that the "Environment " column of the GALL report should depict the actual operating temperature range over which the aging mechanism (which in this case is SCC) is active instead of just stating the operating ambient temperature range of the component in question. The staff does not believe that it can accurately state the range over which a particular aging mechanism is active since it cannot be accurately predicted even if other variables are disregarded but if there are multiple active aging mechanisms at anyone time then that further complicates the predictability of the temperature range over which any one of those aging mechanisms is active.
31	Flow accelerated corrosion in valve bodies	G-VIII-B2-1 G-XI-M6-1	NEI commented that valve bodies are not subject to FAC since valve bodies are usually much thicker than pipe wall. The staff considers that wall thinning in valve bodies is of concern because turbulent flow in the valve bodies can cause flow-accelerated corrosion (FAC). The EPRI program CHECWORKS recognizes valve body susceptibility to FAC.

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Issue #	**Issue**	**NEI Comment Number**	**Staff Preliminary Resolution**
32	Flow accelerated corrosion in aux feedwater	G-VIII-G-1	NEI commented that FAC is not a valid aging mechanism for auxiliary feedwater system piping. The staff considers that flow accelerated corrosion (FAC) of auxiliary feedwater (AFW) lines of recirculating steam generators with preheaters is of concern. In plants with these steam generators (Westinghouse Models D4, D5, and E steam generators), a portion of the main feedwater is diverted to the auxiliary feedwater line via a preheater bypass line during normal operation. As a result, a portion of the auxiliary feedwater line between steam generator and the bypass line connection experiences FAC. At one plant, this portion of the auxiliary feedwater line has experienced significant wall thinning because of FAC. Reference: NRC IN 92-07, "Rapid Flow-Induced Erosion/Corrosion of Feedwater Piping."
33	SRP 4.1.1 – TLAA list information	S4.1-2 S4.1-3	NEI commented to delete the last sentence in the first paragraph. Since it reads, "The listing of TLAAs should provide sufficient detail to identify the type of calculations and a summary result of calculations." NEI states that providing a summary result of a calculation that is a TLAA goes beyond the listing requirements of 10 CFR 54.21(c)(1). Details of an analysis would only be necessary for the demonstration portion if demonstration methods (i) or (ii) were chosen for a TLAA. Staff is considering revising the paragraph so that it is clear that details of an analysis is necessary if demonstration methods (i) or (ii) were chosen for a TLAA.

NEI Issues on Improved License Renewal Guidance Documents for Management Attention (Based on 12/21/00 Public Meeting)			
Issue #	**Issue**	**NEI Comment Number**	**Staff Preliminary Resolution**
34	SRP 4.1.3 – TLAA example tables	S4.1-6	NEI commented that the use of Tables 4.1-2 and 4.1-3 start the reviewer from the wrong place and that the search for possible TLAAs should start from the licensees CLB and the reviewer's knowledge of the six criteria. Staff is considering that the SRP will be used by the staff (not NEI) to perform its review. These tables are helpful to the staff reviewer.
49a	WCAP on internals – cast stainless, hold-down spring, wear, rod drop time, loose parts monitoring	G-IV-B2-9 G-IV-B2-11 G-IV-B2-12 G-IV-B2-22 G-IV-B3-16	Item 49 relates to reactor internals comments that were found to be contradictory with the Westinghouse WCAP-14577. These items are separated into 49a – 49d. The NEI comment G-IV-B2-9 recommends deleting the reference to thermal embrittlement for the mixing vane because the mixing vane at some Westinghouse plants are not made of CASS and the mixing vanes serve no License Renewal intended function. The staff believes that the comment suggests that some plants do have mixing vane devices made of cast austenitic stainless steel (CASS). Also, the staff believes that the mixing vane has a LR intended function. Section 2.6.8 of proposed Rev. 1 of WCAP-14577 cites service history of vane separation from the RCCA spiders, with free RCCA travel inhibited in some instances. Although these vanes do not in of themselves perform any intended function within Part 50, their ability to prevent satisfactory accomplishment of a safety-function by another system, structure or component places them within the context of license renewal in accordance with 10 CFR 54.4(a)(2), and hence aging management must be provided for these components.

NEI Issues on Improved License Renewal Guidance Documents for Management Attention (Based on 12/21/00 Public Meeting)			
Issue #	**Issue**	**NEI Comment Number**	**Staff Preliminary Resolution**
49b	WCAP on internals – cast stainless, hold-down spring, wear, rod drop time, loose parts monitoring	G-IV-B2-11	NEI commented that the hold-down spring does not perform any intended function, and does not require an aging management review and should be removed from GALL. The staff believes that the hold-down spring does support the functions (1), (2), and (4) cited in Section 2.2 of proposed Rev. 1 of WCAP-14577, specifically to support and orient the reactor core; support, orient, guide and protect control rod assemblies; and, provide a passageway for support, guidance and protection for incore instrumentation. In addition, Section 2.6.5 of the topical report cites two instances in which detection of degradation of this component occurred early enough to prevent development of a safety issue, indicative that failure of this component could lead to a safety issue.

NEI Issues on Improved License Renewal Guidance Documents for Management Attention (Based on 12/21/00 Public Meeting)			
Issue #	**Issue**	**NEI Comment Number**	**Staff Preliminary Resolution**
49c	WCAP on internals – cast stainless, hold-down spring, wear, rod drop time, loose parts monitoring	G-IV-B2-12 G-IV-B2-22	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 believes that this comment is inconsistent with Westinghouse recommendations and that no changes in GALL are needed in response to this NEI comment. WCAP 14577, Revision 0, states: "In the reactor internals components, wear between control rods and guide tubes results from the axial sliding that occurs during insertions and withdrawals, and also from the transverse motions caused by flow-induced vibration. Measurements of control rod wear imply that wear on guide tube inner surfaces also occurred." Furthermore it states that current performance monitoring programs (i.e., rod drop time testing performed each cycle) will provide indications of any wear of the guide tube cards during the extended period of operation.

NEI Issues on Improved License Renewal Guidance Documents for Management Attention (Based on 12/21/00 Public Meeting)			
Issue #	**Issue**	**NEI Comment Number**	**Staff Preliminary Resolution**
49d	WCAP on internals – cast stainless, hold-down spring, wear, rod drop time, loose parts monitoring	G-IV-B3-16	NEI commented that loose parts monitoring should be removed as an AMP for the shroud bolts, core shroud assembly bolts, and tie rods because ISI alone is sufficient. NEI suggests that loose parts monitoring will not discover degradation resulting from stress relaxation until after the intended function has failed. Staff considers that loose parts monitoring could detect stress relaxation during power operation before the loss of the intended function. Since the bolts are redundant, loose parts monitoring might pick up degradation upon the first bolts degradation or failure. The inspection is required by ISI only once every 10 years during the shutdown period. This is similar to those identified in Westinghouse WCAP 14577 recommendations (from this point of view, Westinghouse is typical). Gall is not recommending any additional programs, other than existing requirements, for this aging effect.