August 25, 2009

LICENSEE: Nebraska Public Power District

FACILITY: Cooper Nuclear Station Power Plant

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON JUNE 16, 2009, BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION (NRC) STAFF AND NEBRASKA PUBLIC POWER DISTRICT, RELATED TO A CLARIFICATION FOR CERTAIN REQUESTS FOR ADDITIONAL INFORMATION, FOR COOPER NUCLEAR STATION LICENSE RENEWAL

The U.S. Nuclear Regulatory Commission (NRC) staff and representatives of Nebraska Public Power District (NPPD) held a telephone conference call on June 16, 2009, to discuss clarifications for certain draft requests for additional information for Cooper Nuclear Station license renewal.

Enclosure 1 provides a listing of the participants and Enclosure 2 contains a brief description of the conference call.

The applicant had an opportunity to comment on this summary.

/RA/

Tam Tran, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosures:
As stated

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OFFICE	PM:RPB2:DLR	LA:DLR	PM:RPB1:DLR	BC:RPB1:DLR	PM:RPB1:DLR
NAME	E. Sayoc	S. Figueroa	T. Tran	D. Pelton (EKeegan for)	T. Tran (Signature)
DATE	08/04/09	07/23/09	08/19/09	08/25/09	08/25/09

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Memorandum to Nebraska Public Power District from Tam Tran dated August 25, 2009

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON JUNE 16, 2009, BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION (NRC) STAFF AND NEBRASKA PUBLIC POWER DISTRICT, RELATED TO A CLARIFICATION FOR CERTAIN REQUESTS FOR ADDITIONAL INFORMATION, FOR COOPER NUCLEAR STATION LICENSE RENEWAL

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RidsOgcMailCenter Resource

T. Tran
E. Sayoc
B. Brady
F. Lyon
I.Couret
D. Roth (OGC)
A. Jones (OGC)
N. Taylor (RIV)
E. Collins (RIV)
C. Casto (RIV)
B. Maier (RIV)
V. Dricks (RIV)
D. Chamberlain (RIV)
A. Vegel (RIV)
W. Walker (RIV)
G. Miller (RIV)
G. Pick (RIV)

Cooper Nuclear Station

cc:

Mr. Ronald D. Asche
President and Chief Executive Officer
Nebraska Public Power District
1414 15th Street
Columbus, NE 68601

Mr. Gene Mace
Nuclear Asset Manager
Nebraska Public Power District
P.O. Box 98
Brownville, NE 68321

Mr. John C. McClure
Vice President and General Counsel
Nebraska Public Power District
P.O. Box 499
Columbus, NE 68602-0499

Mr. David Van Der Kamp
Licensing Manager
Nebraska Public Power District
P.O. Box 98
Brownville, NE 68321

Mr. Michael J. Linder, Director
Nebraska Department of Environmental Quality
P.O. Box 98922
Lincoln, NE 68509-8922

Chairman
Nemaha County Board of Commissioners
Nemaha County Courthouse
1824 N Street
Auburn, NE 68305

Ms. Julia Schmitt, Manager
Radiation Control Program
Nebraska Health & Human Services R&L
Public Health Assurance
301 Centennial Mall, South
P.O. Box 95007
Lincoln, NE 68509-5007

Deputy Director for Policy
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 218
Brownville, NE 68321

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
612 E. Lamar Blvd., Suite 400
Arlington, TX 76011-4125

Director, Missouri State Emergency Management Agency
P.O. Box 116
Jefferson City, MO 65102-0116

Chief, Radiation and Asbestos Control Section
Kansas Department of Health and Environment
Bureau of Air and Radiation
1000 SW Jackson, Suite 310
Topeka, KS 66612-1366

Ms. Melanie Rasmussen
Radiation Control Program Director
Bureau of Radiological Health
Iowa Department of Public Health
Lucas State Office Building, 5th Floor
321 East 12th Street
Des Moines, IA 50319

Mr. Keith G. Henke, Planner
Division of Community and Public Health
Office of Emergency Coordination
930 Wildwood Drive
P.O. Box 570
Jefferson City, MO 65102

cc:

Mr. Art Zaremba, Director of Nuclear
Safety Assurance
Nebraska Public Power District
P.O. Box 98
Brownville, NE 68321

Mr. John F. McCann, Director
Licensing, Entergy Nuclear Northeast
Entergy Nuclear Operations, Inc.
440 Hamilton Avenue
White Plains, NY 10601-1813

Mr. Mike Boyce
Cooper Strategic Initiatives Manager
Cooper Nuclear Station
72676 – 648A Avenue
Brownville, NE 68321

Mr. Dave Bremer
License Renewal Project Manager
Cooper Nuclear Station
72676 – 648A Avenue
Brownville, NE 68321

Mr. Bill Victor
License Renewal Project Licensing Lead
Cooper Nuclear Station
72676 – 648A Avenue
Brownville, NE 68321
Mr. Jim Loynes
License Renewal Project Engineer
Cooper Nuclear Station
72676 – 648A Avenue
Brownville, NE 68321

Mr. Garry Young
License Renewal Manager
Entergy Nuclear
1448 S.R. 333, N-GSB-45
Russellville, AK 72802

Mr. Alan Cox
License Renewal Technical Manager
Entergy Nuclear
1448 S.R. 333, N-GSB-45
Russellville, AK 72802

Mr. Dave Lach
LRP Entergy Project Manager
Entergy Nuclear
1448 S.R. 333, N-GSB-45
Russellville, AK 72802

Mr. Stewart B. Minahan
Vice President
Nuclear and Chief Nuclear Officer
Cooper Nuclear Station
72676 – 648A Avenue
Brownville, NE 68321

TELEPHONE CONFERENCE CALL
COOPER NUCLEAR STATION
LICENSE RENEWAL APPLICATION
LIST OF PARTICIPANTS

JUNE 16, 2009

PARTICIPANTS	**AFFILIATIONS**
Tam Tran	U.S. Nuclear Regulatory Commission (NRC)
Brian Harris	NRC
Naem Iqbal	NRC
David Alley	NRC
On Yee	NRC
Dave Bremer	Nebraska Public Power District (NPPD)
Jim Loynes	NPPD
Dave Lach	Entergy
Alan Cox	Entergy
Leland Loyd	Entergy
Jacque Lingenfelter	Entergy
Don Fronabarger	Entergy

ENCLOSURE 1

COOPER NUCLEAR STATION POWER PLANT
LICENSE RENEWAL APPLICATION
(Brief description of the conference call)

The U.S. Nuclear Regulatory Commission (NRC) staff and representatives of Nebraska Public Power District (NPPD), held a telephone conference call on June 16, 2009, to discuss clarifications for certain draft requests for additional information (RAI) listed below.

Discussion:

A. The applicant indicated understanding of the following RAIs for response purpose - Final

RAI 4.2-3 (Draft)

Data in Table 4.2-3 Cooper Nuclear Station (CNS) Equivalent Margin Analysis

The license renewal application (LRA) states in Table 4.2-3, "CNS Equivalent Margin Analysis for Lower-Intermediate Circumferential Weld (1-240) for 54 EFPY," that the 54 EFPY fluence at ¼ of the thickness of the RPV wall (¼ T) for the limiting beltline weld is 1.07E+17 n/cm^2 (E > 1.0 MeV). Tables 4.2-2 and 4.2-1 show a value of 1.07E+18 n/cm^2 for the ¼ T fluence at 54 EFPY for the same weld. Please confirm that this entry into Table 4.2-3 is a typographical error and should read 1.07E+18 n/cm^2 (E > 1.0 MeV) or explain the difference between the values in the tables mentioned.

RAI B.1.22-3 (Draft)

Background
LRA Section B.1.22, "Metal-Enclosed Bus," states that this is a new program implemented consistent with GALL AMP XI.E4, "Metal Enclosed Bus," with an exception to inspect the external portions of the bus under GALL AMP XI.E4. GALL AMP XI.E4, Program Element "Detection of Aging Effects," specify inspection frequencies for testing and alternative visual inspection of metal-enclosed bus bolted connections. NUREG-1800 Revision 1, Table 3.6.2, "FSAR Supplement for Aging Management of Electrical and Instrumentation and Control Systems," also identifies the testing and alternative visual inspection test frequencies specified by GALL AMP XI.E4.

Issue
LRA Appendix A, Section A.1.1.22, "Metal-Enclosed Bus Inspection Program," Updated Safety Analysis Report (USAR) supplement for Aging Management Program (AMP) B.1.22 does not specify the frequency of inspection as described in GALL AMP XI.E4 and NUREG-1800 Revision 1, Table 3.6.2,

Request
Revise LRA Appendix A, Section A.1.1.22 to include the testing and alternative visual inspection test frequencies as identified by GALL AMP XI.E4 and NUREG-1800 Revision 1, Table 3.6.2, "Final Safety Analysis Report (FSAR) Supplement for Aging Management of Electrical and Instrumentation and Control Systems, Metal Enclosed Bus Program."

RAI B.1.13-3 (Draft)

Background
LRA Section B.1.23, "Environmental Qualification (EQ) of Electric Components," states that this is an existing program implemented consistent with GALL AMP X.E1, "Environmental Qualification (EQ) of Electric Components," GALL AMP X.E1 and LRA Section B.1.13 program descriptions include EQ reanalysis attributes. LRA Chapter 4.0, Time-Limited Aging Analysis, Section 4.4, "Environmental Qualification (EQ) of Electric Equipment," also states that the EQ program is an existing program that is consistent with GALL AMP X.E1 and that the aging effects associated with Time-Limited Aging Analysis (TLAA) for EQ of electric equipment will be managed for the period of extended operation in accordance with 10 CFR 54.21(c)(1)(iii). NUREG-1800 Revision 1, Table 4.4.2, "Examples of FSAR Supplement for Environmental Qualification of Electrical Equipment TLAA Evaluation," also shows that an EQ program implementation that is in accordance with 10 CFR 54.21(c)(1)(iii) includes reanalysis attributes in the FSAR supplement description.

Issue
The applicant's USAR supplements included in LRA Appendix A, Section A.1.1.13, "Environmental Qualification (EQ) of Electric Components Program," and Section A.1.2.3, "Environmental Qualification of Electrical Components," do not include reanalysis attributes as shown in LRA Section B.1.23, GALL AMP X.E1 and SRP Table 4.4.2.

Request
Provide the reanalysis attributes as per NUREG-1800 Revision 1, "Examples of FSAR Supplement for Environmental Qualification of Electrical Equipment TLAA Evaluation," and GALL AMP X.E1.

RAI 2.3.2.1-1 (Draft)

Residual Heat Removal

LRA pages 11 and 12 read:

> "Appropriate LRA drawings for the systems were reviewed to identify safety-to-nonsafety interfaces. Nonsafety-related components connected to safety-related components were included to the first seismic anchor or base-mounted component. A seismic anchor is defined as hardware or structures that, as required by the analysis, physically restrain forces and moments in three orthogonal directions. Scope was typically determined by the bounding approach, which included piping beyond the safety-to-nonsafety interface up to a base-mounted component, flexible connection, or the end of a piping run (such as a vent or drain line). Also, piping isometrics were used to identify seismic anchors when required to establish scope boundary."

On LRA-2040-SH01 in zones B/C/D-8/9/10 valve RHR-27 is highlighted/color coded red for reactor coolant pressure boundary while the downstream pipe and valve RHR-28 are highlighted yellow (non-safety related affecting safety related). RHR-29 and RHR-30 are similarly highlighted. However, RHR-24 and RHR-25 are both highlighted in red while the piping downstream of RHR-25 is highlighted yellow. In zone C-9 drain valve RHR-297 downstream piping is highlighted red as being in scope as safety-related. The drain lines downstream of most other drain valves are highlighted in yellow as being in scope as nonsafety-related affecting safety-related. Please explain the scoping basis (safety-related reactor coolant system pressure boundary or nonsafety-related affecting safety-related) for inclusion of these and similar drain/vent/test connection valves and downstream piping?

RAI 2.3.2.1-2 (Draft)

Residual Heat Removal

Drawing LRA-2040-SH02 shows in zone H-2 the line downstream of MO-57 to be highlighted aqua/cyan for inclusion as residual heat removal safety-related while the code boundary flag shows this section of line to be “NC”. Is this section of pipe included in scope because it is safety-related or nonsafety-related affecting safety-related?

RAI 2.3.2.7-1 (Draft)

Primary Containment

Drawing LRA-2084 shows instrument lines to PT-2104A and PI-2104AG at zone A-3 branching off an instrument line from penetration X-40A with root valve NBI-49. Drawing LRA-2026-SH01 shows NBI-49 as being the root valve for a Jet Pump 6 flow instrument line. Should the valve identified as NBI-49 shown on LRA-2084 actually be shown as PC-49 as it is shown on drawing LRA-2026-SH01?

RAI 2.3.2.7-2 (Draft)

Primary Containment

Drawing LRA-2084 shows a spare instrument line connection with isolation valve PC-426 at zone B-7 branching off an instrument line from penetration X-40D with root valve NBI-63. Drawing LRA-2026-SH01 shows NBI-63 as being the root valve for a Jet Pump 11 flow instrument line. Should the valve identified as NBI-63 shown on LRA-2084 actually be shown as PC-63 as it is shown on drawing LRA-2026-SH01?

RAI 2.3.2.7-3 (Draft)

Primary Containment

Drawing LRA-2022-SH01 shows at zones E-3/4 an instrument line with isolation valve PC-370 to a PI-3063 on electrical penetration X-101E. This line is not highlighted as being in scope as safety-related or nonsafety-related affecting safety-related. The code boundary flag associated with PC-370 appears to show this line as class 2. The lines containing PC-542 and PC-541 from the drywell personnel airlock are color coded as being in scope with the primary containment. Are the pressure gage and test connection instrument lines on this (and similarly for other) electrical penetrations in scope?

RAI 2.3.3.8-1 (Draft)

Heating, Ventilation and Air Conditioning

Drawing LRA-2024-SH02 shows the H&V Units 1-HV-DG-1A and 1-HV-DG-1B enclosures and associated inlet ducting and damper and exhaust ducting are not highlighted as being in scope. The USAR description indicates that these units normally operate continuously and does not indicate that they are shutdown when the larger H&V units (1-HV-DG-1C and 1-HV-DG-1D) start. The exhaust air flow shown on the drawing appears to be the sum of both the large and small H&V units supply flow. Are these smaller H&V units credited for maintaining acceptable diesel generator room temperatures when the diesels are operating? Could there be any failure of the housing/ducting/dampers associated with these smaller diesel generator room H&V units that could result in a diversion/disruption of adequate airflow/cooling of the diesel generator rooms when the diesels are operating?

RAI 2.3.3.8-2 (Draft)

Heating, Ventilation and Air Conditioning

Drawing LRA-2024-SH02 in zones G/H-6/7 shows a cooling coil condensation/leakage drain line from the 1-HV-DG-1D H&V Unit as not being highlighted as being in scope while the sister unit 1-HV-DG-1C has its cooling coil drain line highlighted as being in scope due to nonsafety-related affecting safety related. Please explain the difference in scoping of these drain lines.

RAI 2.3.3.8-3 (Draft)

Heating, Ventilation and Air Conditioning

Drawing LRA-2018 in zones H/J-6/7 shows the battery rooms non-essential exhaust subsystem not highlighted as being in scope. Could there be any failure of the ducting/dampers in this non-essential subsystem that could result in a diversion/disruption of adequate airflow in the essential control building HVAC system?

RAI 2.3.3.14-1 (Draft)

Auxiliary Systems in Scope for 10 CFR 54.4(a)(2)

Drawing LRA-2012-SH01 at grid location B-2 shows a valve ACD-23 and section of downstream line as not being highlighted as in scope while the line it connects to is highlighted as being in scope. The note in red next to the valve reads "AC UNIT ISOLATED". Is ACD-23 the boundary between the AC Unit and the drain line and if so, should it be highlighted as being in scope?

RAI 2.3.3.14-2 (Draft)

Auxiliary Systems in Scope for 10 CFR 54.4(a)(2)

Drawing LRA-2004-SH02 in zone B-8 shows a 2" flanged Tee and downstream flanged spool piece highlighted as being in scope that has a Note "TEE FOR PRE-OP CHEMICAL FLUSH, DURING NORMAL OPERATION REMOVE TEE & BLIND FLANGE ENDS." Is this TEE and this spool piece normally removed as the note suggests and are the blind flanges that would "normally" be installed included in scope?

RAI 2.3.3.14-3 (Draft)

Auxiliary Systems in Scope for 10 CFR 54.4(a)(2)

Drawing LRA-2042-SH01 in zone B-4 shows the 6" RWCU line from MO-18 out to flow element FE-170 and the ¾" instrument lines associated with FE-170 highlighted red as being in scope as part of the reactor coolant system boundary. The drawing shows the code boundary to be at MO-18. Please confirm that these components are in scope as being part of the reactor coolant system boundary rather than nonsafety-related affecting safety-related.

RAI 2.3.3.14-4 (Draft)

Auxiliary Systems in Scope for 10 CFR 54.4(a)(2)

Drawing LRA-2027-SH01 in zones A/B-3 shows the line between test connection valves RR-41 and RR-42 as well as RR-42 as not being highlighted as being in scope. This seems to be at variance with similar configurations where the scope boundary extends outboard of the first test, vent, drain line valve to a second valve, cap or flange. Please explain the scoping rationale for not including the test connection line past RR-42.

RAI B.1.7-5 (Draft)

Regarding the exception to the BWR SCC AMP

Background
In LRA Appendix B Section B.1.7, the applicant stated that the BWR Stress Corrosion Cracking Program has an exception to the GALL Report. The applicant stated that the exception is that the scope of welds selected for examination is based on risk-informed inservice inspection (RI-ISI) methodology approved by the NRC as well as NRC GL 88-01 and the RI-ISI methodology creates a different inspection schedule for GL 88-01 Category A welds than that delineated in GL 88-01.

In addition, the applicant stated that the applicant's RI-ISI methodology provides an acceptable level of quality and safety and in order to continue the alternative in subsequent intervals during the period of extended operation (beyond the fourth 10-yr interval) approval must be obtained in accordance with 10 CFR 50.55a.

Issue
With or without modifications allowed by BWRVIP-75-A, GL 88-01 requires a specific inspection extent and schedule for Category A welds depending on the water chemistry of reactor coolant. The staff requests the following information to evaluate whether the applicant's methodology is adequate in comparison with GL 88-01.

Request

1. Confirm whether only Category A welds may have a different inspection extent and schedule in the applicant's program when the program is compared with GL 88-01. If the RI-ISI methodology affects any other GL 88-01 inspection category welds in terms of inspection extent and schedule, clarify what categories are affected by the RI-ISI methodology.
2. Provide what actions will be taken in the applicant's program if the extent and schedule of the affected categories, which were identified in the first request, do not meet the requirements of GL 88-01. Provide the justification why the applicant's actions are adequate for the aging management of stress corrosion cracking in the stainless steel and nickel alloy components.

RAI B.1.7-6 (Draft)

BWR SCC AMP Scope over Class 1 versus Non-Class 1

Background
In LRA Table 3.1.2-3 for the components in the reactor coolant pressure boundary, the applicant addressed AMR items of non-Class 1 flow element, instrument line snubber, piping and fittings, tubing and valve body made of stainless steel that are subject to stress corrosion cracking (SCC) in a treated water (> 140 °F) environment in relation to Table 1 item 3.2.1-8. The LRA Table also indicated that the non-Class 1 components are less than 4 inches NPS and are not the part of the pressure boundary as described by Plant-Specific Note 105.

Although the applicant stated that the components are less than 4 inches NPS, the staff was concerned that if the BWR Stress Corrosion Cracking Program is not credited for non-Class 1 components with a nominal diameter of 4 inches or larger, the aging management approach might be in potential conflict with the requirements of GL 88-01 and BWRVIP-75-A as cited in the GALL Report BWR Stress Corrosion Cracking Program that applies to relevant BWR components regardless of ASME Code classification including non-Class 1 components.

Issue
In addition, in LRA Appendix B Section B.1.7, the applicant stated that the BWR Stress Corrosion Cracking Program of the applicant manages SCC and its effect on the reactor coolant pressure boundary components and in LRA Section 2.3.1.3, the applicant stated that the major components of the reactor coolant pressure boundary include the reactor vessel, recirculation loops and the Class 1 portions of various systems connected to the reactor vessel. The statements of the applicant suggest that the applicant's BWR SCC program mainly manages SCC and its effect for Class 1 components only.

Request

1. Clarify whether the applicant's program manages SCC and its effect on non-Class 1 components as well as Class 1 components.
2. Clarify whether the CNS has non-Class 1 components that are subject to the scope of the GALL Report BWR SCC Program in conjunction with GL 88-01.
3. If the CNS has non-Class 1 components under the scope of the GALL Report BWR SCC Program in conjunction with GL 88-01 and the applicant's BWR SCC Program does not manage the aging effect of the non-Class 1 components, clarify what aging management program is used to manage SCC and its effect on non-Class 1 components and provide the justification why a different program is used for the aging management.

RAI 3.1.2.1-1 (Draft)

ESF and Aux. systems

Background
In LRA Table 3.1.2-3, the applicant addressed the AMR items of stainless steel piping, piping components and piping elements that are part of the reactor coolant boundary and are subject to SCC in a treated water (> 140 °F) environment.

In LRA Table 3.2.2-1, 3.2.2-8-1, 3.2.2-8-3 and 3.2.2-8-4, the applicant also addressed the AMR items of stainless steel piping, piping components and piping elements in the engineered safety features system that are subject to SCC in a treated water (> 140 °F) environment.

Similarly, in LRA Tables 3.3.2-2, 3.3.2-14-3, 3.3.2-14-13, 3.3.2-14-16 and 3.3.2-14-21, the applicant addressed the AMR items of stainless steel piping, piping components and piping elements in the auxiliary systems that are subject to SCC in a treated water (> 140 °F) environment.

In LRA Table 3.2.1, item 3.2.1-18 related to the AMR items of the reactor coolant pressure boundary and engineered safety features system and LRA Table 3.3.1, item 3.3.1-38 related to the AMR items of the auxiliary systems, the applicant stated that the BWR Water Chemistry Control – BWR Program is used to manage the aging effect and the effectiveness of the programs will be confirmed by the One-Time Inspection Program.

However, in LRA Table 3.1.2-3, 3.2.2-1, 3.2.2-8-1, 3.2.2-8-3, 3.2.2-8-4, 3.3.2-2, 3.3.2-14-3, 3.3.2-14-13, 3.3.2-14-16 and 3.3.2-14-21, the detailed AMR items credited only the Water Chemistry Control – BWR Program with no additional note for the One-Time Inspection Program in contrast to the statements in LRA Table 3.2.1, item 3.2.1-18 and in LRA Table 3.3.1, item 3.3.1-38.

Issue
It is not clear whether the One-Time Inspection will be used in conjunction with the Water Chemistry Control – BWR Program to manage the aging effect of the AMR items for the reactor coolant pressure boundary, engineered safety features system and auxiliary systems, respectively.

Request
Clarify whether the One-Time Inspection will be used in conjunction with the Water Chemistry Control – BWR Program to manage the aging effect of the AMR items for the reactor coolant pressure boundary, engineered safety features system and auxiliary systems, respectively.

RAI 3.1.2.1-2 (Draft)

(Sections 3.1.2.1.x and 3.3.2.3.x)

Background
In LRA Table 3.1.2-3 (page 3.1-54), the applicant addressed the stainless steel piping, piping elements and piping components in the control rod drive system that are the part of the reactor pressure boundary and are subject to stress corrosion cracking in a treated water environment (> 140 □F). The applicant credited the Inservice Inspection – ISI Program and Water Chemistry Control – BWR Program for the aging management. The applicant also indicated that the consistency note for the AMR item is Note E, which means that the AMR item is consistent with the GALL Report in terms of component, material, environment and aging effect, but a different aging management program is credited for the aging management.

Issue
It is not clear why the applicant did not credit the BWR Stress Corrosion Cracking Program even though the AMR item is regarded to be included in the program scope.

Request
Clarify why this AMR item of the CRD system did not credit the BWR Stress Corrosion Cracking although this item is regarded to be included in the scope of the BWR SCC program. Provide the justification why the Inservice Inspection Program in conjunction with the water chemistry control program can provide adequate aging management for the AMR item.

RAI 3.2.2.3-1 (Draft)

Background
In LRA Tables 3.2.2-4 and 3.2.2-5, the applicant addressed the AMR items of stainless steel flex hose, tubing, valve body, piping and restriction orifice in the engineered safety features (ESF) system that are subject to cracking in a lubricating oil environment.

In LRA Table 3.3.2-4, the applicant also addressed the AMR items of stainless steel restriction orifice, thermowell, tubing and valve body in the auxiliary systems that are subject to cracking in a lubricating oil environment.

The applicant credited the Oil Analysis Program to manage the cracking. However, the applicant did not provide the aging mechanisms associated with the aging effect.

Issue
The applicant did not provide the aging mechanism of cracking that the staff needs to know in order to evaluate the adequacy of the applicant's aging management program.

Request
As for each of the systems (ESF and auxiliary systems): Clarify what aging mechanism causes the stainless steel cracking in the lubricating oil environment. Provide the justification why the Oil Analysis Program can adequately manage the aging effect.

RAI 3.2.2.1-2 (Draft)

Carbon Steel

Background
SRP-LR and LRA Table 3.2.1-32 address the loss of material due to general corrosion from the internal surfaces of steel piping, piping components, and piping elements exposed to uncontrolled indoor air. The applicant proposes to manage this aging process through the use of its aging management program "External Surfaces Monitoring" (LRA B.1.14). The GALL Report recommends that this aging process be managed through the use of the aging management program "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components" (GALL Report Volume 2 Chapter XI.M38). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.2.1-32 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its review of LRA Table 3.2.1-32 the staff noted that the component being considered is the internal surface of piping and ducting. The staff also noted that the aging management program proposed by the applicant is primarily designed to monitor the condition of external surfaces. The staff further noted that the prediction of internal corrosion based on monitoring external surfaces of the same component is possible only when the interior and exterior environments are identical. Lastly the staff noted that sufficient information was not provided in the application to permit a determination that the interior and exterior environments of the components under consideration were identical.

Request
Please select an aging management program designed to monitor the internal surfaces of piping and ducting exposed to uncontrolled indoor air or justify why an external inspection is appropriate to manage the aging of internal corrosion. Justification should be sufficient to demonstrate that the environments are identical in terms of items such as coatings, temperature, velocity, humidity, and contaminants.

RAI 3.2.2.1-3 (Draft)

Background
LRA and SRP Tables 3.2.1-32 address the loss of material due to general corrosion from the internal surfaces of steel piping, piping components, and piping elements exposed to uncontrolled indoor air. The applicant proposes to manage this aging process through the use of its aging management program "Fire Protection" (LRA B.1.16). The GALL Report

recommends that this aging process be managed through the use of the aging management program “Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components” (GALL Report Vol. 2 XI.M38). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.2.1-32 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its review of LRA Table 3.2.1-32, the staff noted that the aging effect being considered is the loss of material due to general corrosion on the internal surface of piping and ducting. The staff also noted that the scope of the proposed aging management program does not include either the internal surfaces of piping in ducting or detection of loss of material due to general corrosion.

Request
Please select an aging management program with a scope which includes detecting loss of material due to general corrosion on the internal surfaces of piping and ducting exposed to uncontrolled indoor air or justify how the currently proposed aging management program will adequately address the corrosion of the components under consideration.

RAI 3.2.2.1-6 (Draft)

Background
LRA and SRP Tables 3.3.1-58 address the loss of material due to general corrosion from the external surfaces of steel components exposed to uncontrolled indoor air, outdoor air, and condensation. The applicant proposes to manage this aging process through the use of its aging management program “Fire Protection” (LRA B.1.16). The GALL Report recommends that this aging process be managed through the use of the aging management program “External Surfaces Monitoring” (GALL Report Volume 2 Chapter XI.M36). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.3.1-58 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its review of LRA Table 3.3.1-58, the staff noted that the aging effect being considered is the loss of material due to general corrosion on the external surface of steel components. The staff also noted that the scope of the proposed aging management program does not include the detection of loss of material due to general corrosion.

Request
Please select an aging management program with a scope which includes detecting loss of material due to general corrosion on external steel surfaces exposed to uncontrolled indoor air, outdoor air, or condensation or justify how the currently proposed aging management program will adequately address the corrosion associated with these components.

RAI 3.2.2.1-7 (Draft)

Background
LRA and SRP Tables 3.3.1-71 address the loss of material due to general, pitting, and crevice corrosion from the internal surfaces of steel piping, piping components, and piping elements exposed to moist air or condensation. The applicant proposes to manage this aging process through the use of its aging management program "Periodic Surveillance and Preventive Maintenance" (LRA B.1.31). The GALL Report recommends that this aging process be managed through the use of the aging management program "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components" (GALL Report Volume 2 Chapter XI.M38). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.3.1-71 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its review of LRA Table 3.3.1-71 the staff noted that the proposed and recommended aging management programs appear to differ in how many components are inspected and the frequency of that inspection. The proposed program appears to indicate that a sample of sufficient size to provide 90% confidence that 90% of the components will not degrade will be inspected every 5 years. The recommended program indicates that all components will be inspected whenever the component is accessible. Based on the difference in the sample size outlined above, it is not clear to the staff that the same level of inspection is provided by the proposed AMP when compared with the AMP recommended by the GALL Report.

Request
Please demonstrate that the level of inspection provided by the proposed aging management program is equivalent to that provided by the recommended aging management program.

RAI 3.4.2.1-2 (Draft)

Background
LRA and SRP Tables 3.4.1-30 address the loss of material due to general, crevice and pitting corrosion from the internal surfaces of steel piping, piping components, and piping elements exposed to outdoor air or condensation. The applicant proposes to manage this aging process through the use of its aging management program "External Surfaces Monitoring" (LRA B.1.14). The GALL Report recommends that this aging process be managed through the use of the aging management program "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components" (GALL Report Volume 2 Chapter XI.M38). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.4.1-30 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its review of LRA Table 3.4.1-30, the staff noted that the component being considered is the internal surface of steel piping. The staff also noted that the aging management program proposed by the applicant is primarily designed to monitor the condition of external surfaces.

The staff further noted that the prediction of internal corrosion based on monitoring external surfaces of the same component is possible only when the interior and exterior environments of that component are identical. Lastly the staff noted that sufficient information was not provided in the application to permit a determination that the interior and exterior environments of the components under consideration are identical.

Request
Please select an aging management program designed to monitor the internal surfaces of steel piping exposed to outdoor air or condensation or justify why an external inspection is appropriate to manage internal corrosion. Justification should be sufficient to demonstrate that the environments are identical in terms of items such as coatings, temperature, velocity, humidity, and contaminants.

RAI 3.4.2.1-3 (Draft)

Background
LRA and SRP Tables 3.4.1-32 address the loss of material due to pitting, crevice, and microbiologically influenced corrosion of stainless steel piping, piping components, and piping elements exposed to raw water. The applicant proposes to manage this aging process through the use of its aging management program "One Time Inspection" (LRA B.1.29). The GALL Report recommends that this aging process be managed through the use of the aging management program "Open Cycle Cooling Water System" (GALL Report Vol. 2 XI.M20). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.4.1-32 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its consideration of these aging management review items, the staff notes that the One Time Inspection AMP is designed to be used when the environment to which a system, structure or component is exposed is invariant with time, for example treated water systems where the water chemistry is frequently monitored and carefully controlled. In such systems, the lack of prior corrosion may be an indicator that future corrosion will not occur. Raw water systems cannot be considered to be invariant with time in terms of chemistry or microbiology. Since stainless steel is highly susceptible to microbiological corrosion and since microbiological corrosion can occur rapidly, the absence of past corrosion cannot be considered a reliable predictor of future corrosion. The staff also notes that the structures, systems, and components under consideration appear to be subject to Generic Letter 89-13 and that a one time inspection of these components appears to be inconsistent with the requirements of the Generic Letter.

Request
Please propose a program to manage the aging of the components under consideration which is consistent with Generic Letter 89-13, which recognizes the variability of the chemistry and microbiology of raw water, and which acknowledges the inability to use past corrosion performance as an indicator of future corrosion under such circumstances.

RAI 3.3.2.3-1 (Draft)

Background
LRA Table 3.3.2-1 addresses the loss of material from the internal surfaces of the phenolic coated carbon steel accumulator in the standby liquid control system which is exposed to sodium pentaborate solution. The applicant proposes that this combination of material, environment and component is not contained in the GALL report. The applicant acknowledges that corrosion for this material and environment combination is possible and proposes to manage that corrosion through the use of their plant-specific Aging Management Program "Periodic Surveillance and Preventive Maintenance". The applicant further states that the phenolic coating is not credited as part of the management of aging. Based on this statement, the staff considered the efficacy of the proposed aging management program relative to bare carbon steel material exposed to sodium pentaborate solution.

Issue
In its review of LRA Table 3.3.2-1, the staff noted that for sodium pentaborate solutions exposed to stainless steel components, the GALL report states that aging in the form of loss of material may occur and that this aging may be managed through a combination of the aging management programs "Water Chemistry – BWR" (GALL Volume 2, Chapter XI.M2) and "One Time Inspection" (GALL Volume 2, Chapter XI.M2). Given that the probability of corrosion for bare carbon steel in sodium pentaborate solutions is greater than for stainless steel, the staff believes that the aging management program used should be more comprehensive than that proposed for stainless steel. The staff also noted that the water chemistry program recommended by the GALL Report will be able to detect changes in the sodium pentaborate solution which may affect its corrosivity and will be able to detect soluble corrosion products in the solution.

Request
Propose an aging management program containing periodic inspections and water chemistry analyses or to justify how the existing program, which does not appear to include water chemistry measurements, will adequately manage corrosion of the carbon steel accumulator.

RAI 3.3.2.1-1 (Draft)

Background
LRA and SRP Tables 3.3.1-53, address the loss of material due to general and pitting corrosion from the internal surfaces of steel piping, piping components, and piping elements exposed to condensation in the compressed air system. The applicant proposes to manage this aging process through the use of its aging management program "Periodic Surveillance and Preventive Maintenance" (LRA B.1.31). The GALL Report recommends that this aging process be managed through the use of the aging management program "Compressed Air Monitoring" (GALL Report Volume 2 Chapter XI.M24). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.3.1-53 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its review of LRA Table 3.3.1-53, the staff noted that the proposed aging management program includes the internal inspection of a single containment penetration associated with the compressed air system. The staff also noted that the aging management program recommended by the GALL report is much more comprehensive including inspection, testing, and preventive maintenance. Given the difference in the programs, the staff questions the effectiveness of the proposed program.

Request
Please select an aging management program designed to detect general and pitting corrosion on the internal surfaces of piping, piping components and piping elements exposed to condensation in the compressed air system as well as a program which includes the testing and preventive maintenance components included in the AMP recommended by the GALL Report or justify how the proposed program will accomplish those functions.

RAI 3.4-1 (Draft)

Background
On LRA page 3.4-79 of LRA Table 3.4.2-2-9, the applicant indicates that copper alloy >15% Zn or >8% Al valve bodies exposed to steam (internal) environment are susceptible to loss of material. In the applicable AMR items for these components, the applicant credits only the Water Chemistry Control – BWR program for aging management.

Issue
The LRA defines steam as “treated water that has been converted to steam”. Table IX.C in Volume 2 of the GALL Report, Revision 1 identifies components made from copper alloy containing >15% Zn or aluminum bronzes (copper-aluminum) alloy containing >8% Al may be susceptible to loss of material due to selective leaching. As a result, the GALL Report recommends that a program corresponding to GALL AMP XI.M35, “Selective Leaching of Materials”, be used to manage loss of material due to selective leaching as a result of exposing these materials to a treated water environment.

Request
Please clarify if this material and environment combination is susceptible to loss of material due to selective leaching:

- If yes, please justify the Water Chemistry Control – BWR program’s ability for aging management without being augmented by the Selective Leaching program to verify loss of material due to selective leaching is not occurring.

- If not, please justify the Water Chemistry Control – BWR program’s ability for aging management without being augmented by the One-Time Inspection program to verify loss of material is not occurring.

RAI 3.3-4 (Draft)

Background
In LRA Tables 3.2.2-01, 3.2.2-03, 3.2.2-04, 3.2.2-06, 3.2.2-07, 3.3.2-01, 3.3.2-04, 3.3.2-06, 3.3.2-07, 3.3.2-08, 3.3.2-12, 3.3.2-13, 3.3.2-14-16 and 3.3.2-14-20, the LRA states that numerous stainless steel, copper alloy and copper alloy >15%Zn or >8%Al components (which cite a note G), which are exposed to air – indoor (internal) do not have an aging effect requiring management, therefore an aging management program is not applicable.

Issue
The applicant did not provide the justification for determining these materials are not subject to an aging effect requiring management when exposed to air-indoor (internal). The staff is concerned the internal environment may contain contaminants and stagnant air which is not the same as freely circulating air-indoor on the external surface.

Request
Please describe in detail, the environmental conditions that exist in the internal environment in each of these components described above and how it compares to the external environment. Also please justify why these components do not experience an aging effect requiring management.

RAI 3.3.2-4 (Draft)

Background
In LRA Tables 3.3.2-6, 3.3.2-12, 3.3.2-14-18, and 3.3.2-14-29, the applicant did not identify the type of plastic materials being used for the listed components.

Issue
Plastic materials have different materials properties that vary depending on chemical compositions which may or may not have an aging effect in indoor air (internal and external) environment.

Request
Please provide the specific type of plastic material used for the various components listed In LRA Tables 3.3.2-6, 3.3.2-12, 3.3.2-14-18, and 3.3.2-14-29 and the applicable aging effect for their given environment.

Please evaluate whether there are any degrading interactions with these plastic materials with the treated water and treated air environment and a justification of why these specific plastic materials do not require an aging effect requiring management or aging managing program.

RAI 3.3.2-6 (Draft)

Background
In LRA Tables 3.3.2-4, the applicant did not identify an aging effect requiring management or Aging managing program for a fiberglass silencer in an indoor air (external/internal) environment.

Issue
The staff reviewed the applicant's usage of fiberglass under an air-indoor (external/internal) environment. The applicant states that an air-indoor environment is on systems with temperatures higher than the dew point and condensation may occur but only rarely, equipment surfaces are normally dry. The staff finds this not acceptable because humidity is easily absorbed in fiberglass. Fiberglass absorbs and can expand microcracks within the matrix of the material and decrease its tenacity.

Request
Please provide justification as to why fiberglass under an air-indoor environment is acceptable for this component.

RAI B.1.15-10 (Draft)

(Follow up to RAI B.1.15-4)

Background
Program Element 6 of NUREG-1801 Section X.M1 is concerning acceptance criteria. Under the CNS Fatigue Monitoring program, B.1.15 (CNS-RPT-LRD02, Revision 1), program element 6 subsection b states: "The Fatigue Monitoring Program acceptance criteria are that none of the transients exceeded the allowable numbers in USAR Table III-3-1 …"

Issue
Clarification is deemed necessary, as described below.

Request
Questions (b) and (c) of RAI B.1.15-3 apply here. Please explain accordingly.

GALL Section X.M1 Element 6 requires maintaining fatigue usage below the design code limit considering environmental fatigue effects. CNS FMP Element 6 does not mention environmental fatigue effects. Please explain why.

RAI 3.2-1 (Draft)

Background
In each of the LRA Tables 3.2.2-7, 3.3.2-3, 3.3.2-4, 3.3.2-14-27, and 3.3.2-14-28, the applicant stated that no aging effect requiring management (AERM) was identified, and no aging managing program (AMP) was required, for one glass item (flow indicators or sight glasses) in gas (internal), condensation (external and internal), or sodium pentaborate (internal) environments. The AMR line items cite Generic Note G, which indicates that the environment is not addressed in the GALL Report for these components and materials.

Issue
The LRA does not identify the type of glasses in the five items and does not provide a technical basis for no AERM or AMP being applicable to these components.

Request
The staff requests further detail on the type of glasses in the table items that cite Generic Note G, and the resistance of those glasses to the specific environments to confirm that there are no aging effects requiring management. Also identify the specific gas environment for the glass flow indicators in Table 3.2.2-7 and 3.3.2-14-28.

RAI 3.3.2.2.6-1 (Draft)

Neutron Absorber Monitoring

Background
The GALL Report identifies loss of material/general corrosion and reduction of neutron-absorbing capacity as aging effects requiring management (AERM) for Boral in BWR treated water, and calls for further evaluation of a plant-specific aging management program.

Issue
CNS LRA Section 3.3.2.6, "Reduction of Neutron-Absorbing Capacity and Loss of Material due to General Corrosion," states that, for Boral spent fuel storage racks exposed to a treated water environment, loss of material is an AERM and reduction of neutron-absorbing capacity is insignificant and requires no aging management. The second statement references CNS plant operating experience with Boral coupons inspected in 2002. The LRA does not address applicability of recent adverse operating experience (plant-specific and industry) with Boral.

The LRA states that management of loss of material is performed by the Neutron Absorber Monitoring and Water Chemistry Control – BWR Programs. However, the CNS LRA does not present sufficient specific plant information on how these programs will manage loss of material for Boral in the spent fuel pool.

Request

1. To enable the staff to assess the adequacy of the existing Neutron-Absorber Monitoring and Water Chemistry Control Programs for managing aging effects for Boral:
    a. Discuss how the CNS Water Chemistry Control – BWR Program will be used to manage the loss of material for Boral spent fuel storage racks, what will be analyzed and measured; if the aluminum content of the spent fuel pool water is not monitored, provide the basis for the adequacy of the program in managing loss of material.
    b. Provide a program description and scope of the Neutron-Absorber Monitoring, including the structures and components, including Boral surveillance coupons, that will be under surveillance. Indicate whether the Boral panels and coupons in the CNS spent fuel pool are vented or not.
    c. Indicate the installation date of the Boral panels/racks in the CNS spent fuel pool.
    d. Describe how the loss of material and degradation of material will be monitored or inspected, specifically the methods, techniques (e.g., visual, weight, volumetric, surface inspection), frequency, sample size, data collection, timing and acceptance criteria.
    e. Discuss the correlation between measurements of the physical properties of Boral coupons and the integrity of the Boral panels in the storage racks.
    f. Identify the subcritical margin used in the criticality analysis. Describe how the program acceptance criteria account for potential degradation between

surveillance periods.

g. For the CNS Boral coupon samples:
    i. Identify the quantity and location of coupons relative to the spent fuel racks during the license renewal period.
    ii. Describe how the coupons are mounted and whether they are fully exposed to the spent fuel pool water.
    iii. Describe the specific testing that will be done for determining the Boral Boron-10 areal density, verifying surface corrosion (if any) and examining for blister formation.
    iv. After removal from the pool for inspection, will the coupons be inserted back at the same locations in the pool?

h. Please describe how the results from the inspections of the Boral coupons will be monitored and trended, including frequency and sample size (e.g., the number of coupons examined at each surveillance).

i. Please describe the corrective actions that would be implemented if coupon test results are not acceptable.

j. Please discuss the CNS operating experience applicable to the Boral panels and coupons, including:
    i. Coupon descriptions, parameters tested or inspected, procedures used, results and conclusions for the 1982 and 1992 inspections and tests and any others, including:
        1. What was the location of coupons relative to the spent fuel racks?
        2. How were the coupons mounted and were they fully exposed to the spent fuel pool water?
        3. What specific testing for determining the Boral Boron-10 areal density, verifying surface corrosion (if any) and examining for blister formation?
        4. After removal from the pool for inspection, were the coupons inserted back at the same locations in the pool?
    ii. Describe the findings from these inspections, in particular any adverse findings, such as blistering or swelling noted in some coupon inspections.

2. In September 2003, inspection of Boral test coupons at Seabrook Nuclear Station revealed bulging and blistering of the aluminum cladding. Blistering and/or bulging on Boral coupons has also been noted at Three Mile Island and Beaver Valley.
    a. Please discuss the impact that these findings, along with any relevant findings at CNS, have on the continued functionality of Boral at CNS.
    b. Since formation of blisters may affect the efficiency of the Boral panels to attenuate neutrons (through flux trap formation) and may cause deformation of the fuel cells, please justify the basis for concluding that blistering will not be a safety concern at CNS.
3. With recent industry and plant-specific operating experience indicating conditions that could ultimately lead to reduction in neutron absorbing capacity of Boral at CNS, and the GALL report listing reduction in neutron absorbing capacity as an AERM for Boral:
    a. Justify why reduction of neutron absorption capability has not been identified as an aging effect requiring management (AERM) for the Boral materials used in the CNS spent fuel pool storage racks, particularly when loss of material has been identified as an AERM for this material.
    b. Describe how the neutron-absorbing capacity and degradation of material will be monitored, including a description of the parameters, calculations, and acceptance criteria.

c. Clarify the applicability of the LRA Section 3.3.2.2.6 references, BNL-NUREG-25582 and NUREG-1787 to the CNS program for managing reduction of neutron-absorbing capacity due to sustained irradiation of Boral, considering findings from the CNS coupon surveillance program and those at other plants.

RAI 2.3.3.6-1 (Draft)

Section 2.1 "Fire Protection System Clean Water Supply," of the CNS Safety Evaluation Report, dated April 29, 1983, states that "…A clean water fire protection system is being installed at CNS which upgrades the existing system that takes suction from the Missouri River…" LRA drawing LRA-2016-SH01A-0 shows the water treatment system as being in the scope of the license renewal and subject to an AMR. This drawing show the 15,000-gallon fire system flushing tank and associated components at locations A10, A11, B10, and B11 as out of scope (i.e., not colored in red). The staff requests that the applicant verify whether the 15,000-gallon fire system flushing tank and associated components are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

RAI 2.3.3.6-2 (Draft)

The LRA drawing LRA-2016-SH02-0 shows fire water system valves and nozzles at locations F9, G10, and H9 as out of scope (i.e., not colored in red). The staff requests that the applicant verify whether the above fire hose connections are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If these hose connections are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

RAI 2.3.3.6-3 (Draft)

Section 4.3.1.4, "Interior Hose Stations," of the CNS Safety Evaluation Report, dated May 23, 1979, states that "…Fifty-four interior stations are strategically located through the plant…" The staff requests that the applicant verify whether all fifty-four hose stations are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If any is excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

RAI 2.3.3.6-4 (Draft)

Section 4.3.1.6, "Foam Suppression System," of the CNS Safety Evaluation Report, dated May 23, 1979, states that "…The licensee will provide an automatic foam suppression system over the diesel fire pump in the intake structure and manual foam capability to include inductors and foam concentration in a readily available location." The staff requests that the applicant verify whether the automatic foam suppression system over the diesel fire pump is in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If automatic foam suppression system and associated components are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

RAI 2.3.3.6-8 (Draft)

LRA Section 2.3.3-6, states that, "…The FP – water system includes water storage tanks, one diesel-driven 3000 gpm fire pump, one electric-driven 3000 gpm fire pump, one 30 gpm jockey fire pump…" "…Two above-ground fire protection water storage tanks, each having a gross capacity of 500,000 gallons of water, provide the dedicated water supply of fire protection use…" "…The tanks supply water to two fire pumps located in the fire pump house, one electric-driven and one diesel-driven. A third fire pump takes suction directly from the Missouri River and provides a backup supply to the system…" LRA Section 2.3.3.6 discusses requirements for the fire water supply system but does not mention trash racks and traveling screens for the backup fire pump suction water supply. Trash racks and traveling screens are typically located upstream of the fire pump suctions to remove any major debris from the fresh or raw water to prevent clogging of the fire protection water supply system. Trash racks and traveling screens are typically considered to be passive, long-lived components. Both the trash racks and traveling screens are located in a fresh or raw water/air environment and are typically constructed of carbon steel. Carbon steel in a fresh or raw water environment or water/air environment is subject to loss of material, pitting, crevice formation, and microbiologically influenced corrosion and fouling. Explain the apparent exclusion of the trash racks and traveling screens that are located upstream of the fire pump suctions from the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1).

Scoping and Screening Audit May 5 - 8, 2009 - the following RAI are the results from the audit

RAI 2.1-1 (Draft)

Background
10 CFR 54.4(a)(2) requires that all nonsafety-related systems, structures, and components (SSCs) whose failure could prevent satisfactory accomplishment of any of the functions identified in 10 CFR 54.4(a)(1)(i-iii) be included within the scope of license renewal.

LRA Section 2.1.1.2.2, "Physical Failures of Nonsafety-Related SSCs," states:

> "The review utilized a spaces approach for scoping of nonsafety-related systems with potential spatial interaction with safety-related SSCs. The spaces approach focuses on the interaction between nonsafety-related and safety-related SSCs that are located in the same space. A "space" is defined as a room or cubicle that is separated from other spaces by substantial objects (such as wall, floors, and ceilings). The space is defined such that any potential interaction between nonsafety-related and safety-related SSCs, including flooding, is limited to the space. Nonsafety-related systems that contain water, oil, or steam with components located inside structures containing safety-related SSCs are potentially in scope for possible spatial interaction under criterion 10 CFR 54.4(a)(2). These systems were evaluated further to determine if system components were located in a space such that safety-related equipment could be affected by a component failure."

Issue
During the scoping and screening methodology audit, the staff performed a walk-down of the turbine building. The staff determined that the basement portion of the turbine building, which contains high-energy, fluid-filled, nonsafety-related systems, was not included within the scope of license renewal although there is a direct open path from the basement to higher elevations, which contain safety-related SSCs.

Request
The staff determined that the nonsafety-related, fluid-filled SSCs were not located in a separate space from safety-related SSCs as described in LRA Section 2.1.1.2.2. The staff requests that the applicant describe the methods used and the basis for conclusions, in determining to not include nonsafety-related, fluid-filled SSCs within the scope of license renewal when located in the same space as safety-related SSCs.

As part of your response, please address the extent of condition and additional scoping reviews performed for nonsafety-related SSCs located within the same space as safety-related SSCs, with the potential to affect safety-related SSCs. List any additional SSCs included within the scope of license renewal as a result of the review, and list those structures and components for which aging management reviews were conducted. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effects.

RAI 2.1-2 (Draft)

Background
10 CFR 54.4(a)(2) requires that all nonsafety-related systems, structures, and components (SSCs) whose failure could prevent satisfactory accomplishment of any of the functions identified in 10 CFR 54.4(a)(1)(i-iii) be included within the scope of license renewal.

LRA Section 2.1.2.1.2, "Identifying Components Subject to Aging Management Review Based on Support of an Intended Function for 10 CFR 54.4(a)(2)," states:

> "Appropriate LRA drawings for the systems were reviewed to identify safety-to-nonsafety interfaces. Nonsafety-related components connected to safety-related components were included to the first seismic anchor or base-mounted component. A seismic anchor is defined as hardware or structures that, as required by the analysis, physically restrain forces and moments in three orthogonal directions. Scope was typically determined by the bounding approach, which included piping beyond the safety-to-nonsafety interface up to a base-mounted component, flexible connection, or the end of a piping run (such as a vent or drain line). Also, piping isometrics were used to identify seismic anchors when required to establish scope boundary. This is consistent with the guidance in NEI 95-10, Appendix F."

Issue
The staff determined that the license renewal drawings identified, by color coding, certain piping as being within the scope of license renewal in accordance with 10 CFR 54.4(a)(1) up to a room or building boundary (wall). However, the drawing does not indicate that the attached piping on the opposite side of the wall, is within the scope of license renewal (the piping is not color coded to indicate being within the scope of license renewal in accordance with 10 CFR 54.4(a)(1) or 10 CFR 54.4(a)(2)).

Request
The staff requests that the applicant address whether all nonsafety-related piping, attached to safety-related piping at room boundaries and extending beyond the room which contains the safety-related piping, was included within the scope of license renewal up to and including a seismic anchor or bounding condition.

As part of your response, please address the extent of condition and additional scoping reviews performed for nonsafety-related SSCs attached to safety-related SSCs. List any additional SSCs included within the scope of license renewal as a result of the review, and list those structures and components for which aging management reviews were conducted. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effects.

RAI 3.1-2 (Draft)

Background
In each of LRA Sections 3.2.2.2.1, 3.3.2.2.1 and 3.4.2.2.1, an identical statement which reads "Evaluation of this TLAA is addressed in Section 4.3." is included.

Issue
It is unclear to the staff whether LRA Section 4.3 has covered fatigue TLAA for the components under groups of Engineered Safety Features (ESF), Auxiliary Systems (AUX), and Steam and Power Conversion (SPC), corresponding to the three sections listed above, as the applicant claimed. At least, the information provided in LRA Section 4.3 is inadequate or insufficient to enable readers to identify which of the three groups each TLAA is associated with.

Request
Please list the components (or identify subsections under LRA Section 4.3) that have fatigue TLAA analyzed for ESF. Similarly list the components evaluated for AUX, and SPC. If none is identified in any of the groups, explain the reason for omission and correct inconsistency for the LRA sections listed in Background.

RAI 3.1-3 (Draft)

Background
LRA Table 3.3.2-14-2 lists the AMR results for components in the AUX group, in which 16 of the 18 TLAA items identified being consistent with the GALL Report were simultaneously cited with Note C and Note 305. In addition, the applicant also correlated these items to GALL Vol. 2 items VIII.B1-10 and VIII.B2-5.

Issue
Note 305 states that "… Although this environment does not directly compare with any NUREG-1801 defined environment, it is considered the equivalent of steam or treated water for the evaluation of cracking due to fatigue." Comparing the environments indicated in GALL VIII.B1 and VIII.B2 against the environments indicated in the AMR lines of interest, the staff found that both the GALL and the LRA essentially mentioned the same environments: treated water and steam. Furthermore, GALL Table 2 items VIII.B1 is intended for PWR plants but CNS is a BWR plant. Additionally, Note C and Note 305 contradict each other because Note C says that everything is consistent with the GALL, including environment, except for the component while

Note 305 says "environment does not directly compare with any NUREG-1801 defined environment."

Request

1. Provide basis regarding using Note 305 for the 16 items mentioned in Background.
2. Provide basis for correlating components to the GALL VIII.B1 items which is for PWRs, when CNS is a BWR plant.
3. Note C and Note 305 appear to be conflicting. Justify using these two notes for the same item.

B. The following RAI were revised or withdrawn based on the clarification listed below – clarification

RAI 3.2.2.1-1 (Draft)

Background
LRA and SRP Sections 3.2.2.2.3.2 refer to LRA and SRP Tables 3.2.1-4. These tables address the loss of material due to pitting crevice corrosion of stainless steel piping, piping components, and piping elements exposed to soil. These tables recommend "further evaluation" on the part of the staff. The applicant proposes to manage this aging process through the use of its aging management program "Buried Piping and Tanks Inspection" (LRA B.1.3). The GALL Report recommends that this aging process be managed through the use of a plant-specific aging management program. The applicant proposes that the aging management review items associated with Table 3.2.1-4 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its consideration of these aging management review items, the staff notes that the "Buried Piping and Tanks Inspection" aging management program contained in the GALL Report does not include stainless steel. The staff also notes that the corrosion characteristics of stainless steel differ from carbon steel sufficiently so some of the recommendations contained in the recommended aging management program could be counterproductive for stainless steel. The staff further notes that during its aging management program audit, a request for additional information was issued requesting that the applicant remove stainless steel from its Buried Piping and Tanks Inspection program. Lastly, the staff notes that during the audit, the applicant informed the staff that, contrary to the AMR item being considered, there is no buried stainless steel piping at Cooper Nuclear Station.

Request
Please clarify the existence of buried stainless steel piping and, if buried stainless steel piping is present, propose an aging management program which will adequately address pitting and crevice corrosion of stainless steel pipe in contact with soil.

Clarification
During the conference call, the applicant indicated that the information requested is provided in the response for RAI B.1.3-1. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 3.2.2.1-4 (Draft)

Background
LRA and SRP Tables 3.2.1-34 address the loss of material due to general, pitting, and crevice corrosion from the internal surfaces of steel piping, piping components, and piping elements exposed to condensation. The applicant proposes to manage this aging process through the use of its aging management program "Periodic Surveillance and Preventive Maintenance" (LRA B.1.31). The GALL Report recommends that this aging process be managed through the use of the aging management program "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components" (GALL Report Volume 2 Chapter XI.M38). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.2.1-34 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its review of LRA Table 3.2.1-34, the staff noted that the aging effect being considered is loss of material from the internal surfaces of piping. The staff also noted that the proposed aging management program is designed to monitor external surfaces but that it can be used to predict internal corrosion if the internal and external environments are identical. The staff further noted that the proposed aging management program specifically calls for some inspection of piping associated with this line item. Lastly the staff noted that it is not clear from the application whether the inspections called for are internal inspections or whether the internal and external environments associated with these components are identical.

Request
Please select an aging management program designed to monitor the internal surfaces of piping, piping components and piping elements exposed to condensation or to confirm that the inspections indicated by the proposed aging management program are internal inspections and that they are consistent with the intent, scope, and frequency of the aging management program recommended by the GALL Report or justify why an external inspection is appropriate to manage the aging of internal corrosion. Justification should be sufficient to demonstrate that the environments are identical in terms of items such as coatings, temperature, velocity, humidity, and contaminants.

Clarification
The staff clarified that LRA Table 3.2.1-34 is referring to item 3.2.1-34 of the LRA Table 3.2.1. Based on the discussion on the clarification, the staff agreed to revise this RAI, as follow:

Issue
In its review of LRA Table 3.2.1-34, the staff noted that the aging effect being considered is loss of material from the internal surfaces of piping in the reactor core isolation cooling (RCIC) system. The staff also noted that in the table included in the proposed aging management program (AMP), the applicant routinely states whether the inspections to be performed are internal or external. However, for piping inspection in the RCIC system, the applicant is silent concerning whether the inspections to be conducted are internal, external, or both.

Request
Please specify in the proposed AMP whether the inspections to be conducted of piping in the RCIC system are internal, external or both.

RAI 3.2.2.1-5 (Draft)

Background
LRA and SRP Tables 3.3.1-47 address the loss of material due to general, pitting, and crevice corrosion from the steel piping, piping components, piping elements, tanks and heat exchanger components. The SRP defines the environment as "closed cycle cooling water". The LRA defines the environment as "treated water". The applicant proposes that "treated water" approximates "closed cycle cooling water" (LRA note 306). The applicant proposes to manage this aging process through the use of its aging management program "Water Chemistry Control – Auxiliary Systems" (LRA B.1.38). The GALL Report recommends that this aging process be managed through the use of the aging management program "Closed Cycle Cooling Water System" (GALL Report Volume 2 Chapter XI.M21). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.3.1-47 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its review of LRA Table 3.3.1-47, the staff noted that neither the target values for the water chemistry nor the industry standard upon which the target water chemistry values are based are provided. The staff also noted from the operating experience associated with the proposed aging management program that water chemistry excursions are not rare events. The staff further noted that the proposed aging management program calls for a one time inspection to verify the effectiveness of the water chemistry program. Lastly the staff questions the effectiveness of a one time inspection program for the components being considered in light of the water chemistry excursions reported and the periodic inspections included in the aging management program recommended by the GALL Report.

Request
Please provide information concerning the source of the industry guidelines used in determining the appropriate water chemistry for the system, the critical characteristics of the system(s) being considered, e.g., boiler pressures, and justification regarding why a one time inspection should be considered adequate to manage aging in light of the stated variability in the water chemistry.

Clarification
Based on the discussion on the clarification, the staff agreed to revise this RAI, as follow:

Issue
In its review of LRA Table 3.3.1-47, the staff noted that neither the target values for the water chemistry nor the industry standard upon which the target water chemistry values are based are provided. The staff also noted from the operating experience associated with the proposed aging management program that water chemistry excursions are not rare events. The staff further noted that the proposed aging management program calls for a one time inspection to verify the effectiveness of the water chemistry program. Lastly, the staff questions the effectiveness of a one time inspection program for the components being considered in light of the water chemistry excursions reported in the applicant's operating experience and the inclusion of periodic inspections in the aging management program recommended by the GALL Report.

Request
Please provide information concerning the target water chemistry values, the source of the industry guidelines used in determining the appropriate water chemistry for the system (it should be noted that water chemistry guidance provided by a manufacturer or a water treatment company do not constitute an industry standard), the critical characteristics of the system(s) being considered, e.g., boiler pressures, and justification regarding why a one time inspection should be considered adequate to manage aging in light of the stated variability in the water chemistry.

RAI 3.2.2.1-8 (Draft)

Background
LRA and SRP Tables 3.2.1-35 address the loss of material due to general, pitting, crevice, galvanic, and microbiologic corrosion as well as fouling of steel containment isolation piping and components exposed to raw water. The applicant proposes to manage this aging process through the use of its aging management program "Periodic Surveillance and Preventive Maintenance" (LRA B.1.31). The GALL Report recommends that this aging process be managed through the use of the aging management program "Open Cycle Cooling Water System" (GALL Report Vol. 2 XI.M20). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.2.1-35 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its consideration of these aging management review items, the staff notes that inspection of the internal surfaces of all containment isolation piping is not specifically mention in the proposed program. The staff also noted that the aging management program recommended by the GALL Report addresses inspection, performance testing, and materials of construction of containment isolation piping while the program proposed by the applicant is only an inspection program which may or may not inspect the internal surfaces of the subject piping. The staff questions how the proposed aging management program will address internal corrosion using external inspections.

Request
Please clarify how the proposed program will manage corrosion on the internal surfaces of containment isolation piping.

Clarification
The applicant indicated that this item is not actually related to aging effect with service water environment. Based on the discussion on the clarification, the staff agreed to re-examine this issue. The staff concluded that this RAI is warranted and would be issued as final RAI.

RAI 3.2.2.1-9 (Draft)

Background
LRA and SRP Tables 3.2.1-37 address the loss of material due to pitting, crevice, and microbiologically influenced corrosion of stainless steel piping, piping components, and piping elements exposed to raw water. The applicant proposes to manage this aging process through the use of its aging management program "One Time Inspection" (LRA B.1.29). The GALL Report recommends that this aging process be managed through the use of the aging management program "Open Cycle Cooling Water System" (GALL Report Vol. 2 XI.M20). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.2.1-37 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its consideration of these aging management review items, the staff notes that the One Time Inspection AMP is designed to be used when the environment to which a system, structure or component is exposed is invariant with time, for example treated water systems where the water chemistry is frequently monitored and carefully controlled. In such systems, the lack of prior corrosion may be an indicator that future corrosion will not occur. Raw water systems cannot be considered to be invariant with time in terms of chemistry or microbiology. Since stainless steel is highly susceptible to microbiological corrosion and since microbiological corrosion can occur rapidly, the absence of past corrosion cannot be considered a reliable predictor of future corrosion. The staff also notes that the structures, systems, and components under consideration appear to be subject to Generic Letter 89-13 and that a one time inspection of these components appears to be inconsistent with the requirements of the Generic Letter.

Request
Please propose a program to manage the aging of the components under consideration which is consistent with Generic Letter 89-13, which recognizes the variability of the chemistry and microbiology of raw water, and which acknowledges the inability to use past corrosion performance as an indicator of future corrosion under such circumstances.

Clarification:
The applicant indicated the service water being used at CNS is not raw water. Based on the discussion on the clarification, the staff agreed to re-examine this issue. The staff concluded to withdraw this RAI.

RAI 3.4.2.1-1 (Draft)

Background
SRP-LR and LRA Table 3.4.1-28 address the loss of material due to general corrosion from the external surfaces of steel components exposed to uncontrolled indoor air, outdoor air or condensation. Both the SRP-LR and LRA Table 3.4.1-28 propose the use of the Aging

Management Program "External Surfaces Monitoring" (LRA B.1.14 and GALL Report Volume 2 Chapter XI.M36) to manage the aging process. However, for at least some LRA Table 2 items subordinate to LRA Table 3.4.1-28, the applicant proposes that no aging effect is present and that no aging management program is required (generic note I).

Issue
In its review of LRA Table 3.4.1-28 the staff noted that the applicant's basis for stating that no aging effect was present was that the temperature of the components under consideration was above the dewpoint. The GALL Report finds that the aging effect of loss of material due to exposure of steel surfaces to indoor air, which is defined as having a temperature above the dewpoint, should be considered.

Request
Please adopt an aging management program for the components under consideration.

Clarification:
The applicant inquired about the reason for the dew point as the condition in question for this RAI, given that the surfaces of the main steam system are assumed to be hot. The staff agreed to revise this RAI, as follow:

Issue
In its review of LRA Table 3.4.1-28, the staff noted that the applicant's basis for stating that no aging effect was present was that the temperature of the components under consideration was above the dewpoint. The GALL Report finds that the aging effect of loss of material due to exposure of steel surfaces to indoor air, which can result in condensation but only rarely, should be considered.

Request
Please justify why aging management is not required for these components given that, during normal plant events such as refueling, the components under consideration will be at or near ambient temperature.

RAI 3.1.2.3-1 (Draft)

Background
LRA Table 3.1.2-3 contains items addressing carbon steel valve bodies less than 4 inches NPS exposed to indoor air on their external surfaces. The applicant proposes that this combination of component and material is not found in the GALL Report (general note G). The applicant further proposes that this combination of environment and material is not subject to aging and that no aging management program is required.

Issue
In its review, the staff found that essentially identical combinations of materials and environments were present in the GALL Report, albeit not in the reactor coolant system. The staff noted that the applicant's basis for stating that no aging effect was present was that the temperature of the components under consideration was above the dewpoint. The GALL Report finds that the aging effect of loss of material due to exposure of steel surfaces to indoor air, which is defined as having a temperature above the dewpoint, should be considered.

Request
Please adopt an aging management program for the components under consideration.

Clarification
The applicant inquired about the reason for the dew point as the condition in question for this RAI, given that the surfaces of the main steam system are assumed to be hot. Based on the discussion on the clarification, the staff agreed to revise this RAI, as follow:

Background
License Renewal Application (LRA) Table 3.1.2-3 contains items addressing carbon steel valve bodies less than 4 inches nominal pipe size exposed to indoor air on their external surfaces. The applicant proposes that this combination of component and material is not found in the GALL Report (general note G). The applicant further proposes that this combination of environment and material is not subject to aging and that no aging management program is required.

Issue
In its review, the staff found that essentially identical combinations of materials and environments were present in the GALL Report, albeit not in the reactor coolant system. The staff noted that the applicant's basis for stating that no aging effect was present was that the temperature of the components under consideration was above the dewpoint. The GALL Report finds that the aging effect of loss of material due to exposure of steel surfaces to indoor air, which can result in condensation but only rarely, should be considered. The staff also noted some apparent contradiction between plant-specific notes 102 and 104 which are related to these components.

Request
Please clarify the plant-specific notes and to justify why aging management is not required for these components given that, during normal plant events such as refueling, the components under consideration will be at or near ambient temperature.

RAI 3.2.2.2-1 (Draft)

Background
LRA and SRP Sections 3.2.2.2.3.6 refer to LRA and SRP Tables 3.2.1-8. These tables address the loss of material due to pitting and crevice corrosion on stainless steel, piping, piping components, and piping elements as well as tanks exposed to internal condensation. These tables recommend "further evaluation" on the part of the staff. The applicant proposes to manage this aging process through the use of its aging management program "Periodic Surveillance and Preventive Maintenance" (LRA B.1.31). The GALL Report recommends that this aging process be managed through the use of a plant-specific aging management program. The applicant proposes that the aging management review items associated with Table 3.2.1-8 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its review of LRA Table 3.2.1-8, the staff noted that the aging effect under consideration is corrosion of internal surfaces. The staff also notes that the proposed program is designed primarily to detect external corrosion unless an internal inspection is specifically called for. The staff further notes that there is no mention in the proposed aging management program of internal inspections of stainless steel piping in the reactor core isolation cooling system.

Request
Please provide how the proposed aging management program will manage internal corrosion on the components being considered.

Clarification:
The applicant clarified that this item is being addressed under periodic surveillance and preventative maintenance program. The staff agreed to revise this RAI, as follow:

Issue
In its review of LRA Table 3.2.1-8, the staff noted that the aging effect being considered is loss of material from the internal surfaces of piping in the RCIC system. The staff also noted that in the table included in the proposed AMP, the applicant routinely states whether the inspections to be performed are internal or external. However, for piping inspection in the RCIC system, the applicant is silent concerning whether the inspections to be conducted are internal, external, or both.

Request
Please specify in the proposed AMP whether the inspections to be conducted of piping in the RCIC system are internal, external or both.

RAI 3.4.2.2-1 (Draft)

Background
LRA and SRP Sections 3.4.2.2.3 refer to LRA and SRP Tables 3.4.1-8. These tables address the loss of material due to general, pitting, crevice, and microbiologically influenced corrosion (MIC), as well as fouling in steel piping, piping components and piping elements exposed to raw water. These tables recommend “further evaluation” on the part of the staff. The applicant proposes to manage this aging process through the use of its aging management program “Periodic Surveillance and Preventive Maintenance” (LRA B.1.31). The GALL Report recommends that this aging process be managed through the use of a plant-specific aging management program. The applicant proposes that the aging management review items associated with Table 3.4.1-8 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its review of LRA Table 3.4.1-8, the staff noted that the proposed aging management program is primarily designed for the detection of corrosion on external surfaces. The staff also noted that the inspection of the internal surfaces of the components under consideration is not specifically mentioned in the proposed program. The staff further noted that for similar materials, environments and aging effects, the aging management program recommended by the GALL Report addresses inspection, performance testing, and materials of construction; the program proposed by the applicant is only an inspection program which may or may not inspect the internal surfaces of the subject piping. The staff questions how the proposed aging management program will address internal corrosion using external inspections.

Request
Please justify how the proposed program will adequately manage internal corrosion of the components under consideration.

Clarification
The applicant clarified that the details of this proposed plant-specific aging management program are documented in the Periodic Surveillance and Preventive Maintenance aging management program. The staff agreed to revise this RAI.

Issue
In its review of LRA Table 3.4.1-8, the staff noted that the components under consideration are part of the circulating water system. The staff also noted that the GALL Report recommends a plant-specific aging management program because at least most of the circulating water system is not within the scope of the GALL AMP, “open cycle cooling water”. The staff further noted that the materials and environments currently under consideration are probably identical to the materials and environments for which the recommended AMP is open cycle cooling water. The staff concludes that an appropriate AMP for this service would include most of the key points included in the open cycle cooling water AMP. Lastly, the staff noted that the proposed program is only a visual inspection program.

Request
Please propose an aging management program which is substantially consistent with the open cycle cooling water AMP or justifying how the proposed program will adequately manage internal corrosion of the components under consideration.

RAI 3.3.2.1-2 (Draft)

Background
LRA and SRP Tables 3.3.1-62 address the loss of material due to pitting and crevice corrosion for aluminum alloy fire protection piping, piping components, and piping elements exposed to raw water. The applicant proposes to manage this aging process through the use of its aging management program “Periodic Surveillance and Preventive Maintenance” (LRA B.1.31). The GALL Report recommends that this aging process be managed through the use of the aging management program “Fire Protection” (GALL Report Vol. 2 XI.M26). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.2.1-81 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

In its review of LRA Table 3.3.1-62, the staff noted that the component under consideration is from the plant drain system as opposed to the fire protection system. While the staff agrees that the GALL Report item selected (3.3.1-62) is the best (and in this case the only) item available which considers loss of material from aluminum exposed to raw water, the staff finds that the difference in the system renders the GALL Report's recommendation of using the Fire Protection aging management program inappropriate. The staff believes that an aging management program such as "Open Cycle Cooling Water System" is a more appropriate standard against which to consider the applicant's proposed aging management program.

Issue
In its consideration of these aging management review items, the staff noted that it is not obvious that all the service water system components under consideration are specifically included in the proposed aging management program. The staff also noted that the aging management program recommended by the GALL Report addresses inspection, performance testing, and materials of construction of piping while the program proposed by the applicant is only an inspection program which may or may not inspect the internal surfaces of the subject piping. The staff questions whether the proposed aging management program will adequately address the loss of material from the components being considered.

Request
Please clarify how the proposed aging management program will adequately address the loss of material from the components being considered.

Clarification:
The applicant clarified that the requested information are provided in LRA Table item 3.2.1-81. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 3.3.2.1-3 (Draft)

Background
LRA and SRP Tables 3.3.1-76 address the loss of material due to general, pitting, crevice, galvanic, and microbiologic corrosion as well as fouling and lining/coating degradation of steel piping, piping components, and piping elements exposed to raw water. The applicant proposes to manage this aging process through the use of its aging management program "Periodic Surveillance and Preventive Maintenance" (LRA B.1.31). The GALL Report recommends that this aging process be managed through the use of the aging management program "Open Cycle Cooling Water System" (GALL Report Vol. 2 XI.M20). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.3.1-76 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its review of LRA Table 3.3.1-76, the staff noted that the inspection of the internal or external surfaces of all service water piping is not specifically mentioned in the proposed program. The staff also noted that the aging management program recommended by the GALL Report addresses inspection, performance testing, and materials of construction of the components under consideration while the program proposed by the applicant is only an inspection program which may or may not inspect the appropriate surfaces of the subject piping. The staff questions whether the proposed program will adequately address the aging of these components.

Also during its review of these aging management review items, the staff noted that the SRP Table 3.3.1-76 refers to 3 GALL Report Volume 2 items, VII.C1-19, VII.C3-10, and VII.H2-22. Of these three Volume 2 items, the LRA contains entries for only VII.C1-19. Based on the staff's understanding of the construction of Cooper Nuclear Station, it seems likely that components meeting the criteria of VII.C3-10 and VII.H2-22 are present and should be included in the LRA.

Request
Please clarify how the proposed program will manage the corrosion on the piping system under consideration. Please provide AMR items associated with GALL Report Volume 2 items VII.C3-10 and VII.H2-22 or provide justification as to why such line items are not required.

Clarification:
The applicant clarified that this item is not applicable for CNS (not for service water, versus raw water). Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 3.3.2.1-4 (Draft)

Background
LRA and SRP Tables 3.3.1-79 address the loss of material due to pitting and crevice corrosion as well as fouling of stainless steel piping, piping components, and piping elements exposed to raw water. The applicant proposes to manage this aging process through the use of its aging management program "Periodic Surveillance and Preventive Maintenance" (LRA B.1.31). The GALL Report recommends that this aging process be managed through the use of the aging management program "Open Cycle Cooling Water System" (GALL Report Vol. 2 XI.M20). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.3.1-79 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its consideration of these aging management review items, the staff notes that inspection of the internal surfaces of all stainless steel service water piping is not specifically mentioned in the proposed program. The staff also noted that the aging management program recommended by the GALL Report addresses inspection, performance testing, and materials of construction of containment isolation piping while the program proposed by the applicant is only an inspection program which may or may not inspect the internal surfaces of the subject piping. The staff questions how the proposed aging management program will address internal corrosion using external inspections.

Request
Please clarify how the proposed program will manage corrosion on the internal surfaces of stainless steel service water piping.

Clarification:
The applicant clarified that this item is being managed by the service water integrity program. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 3.3.2.1-5 (Draft)

Background
LRA and SRP Tables 3.3.1-79 address the loss of material due to pitting, crevice corrosion and fouling of stainless steel piping, piping components, and piping elements exposed to raw water. The applicant proposes to manage this aging process through the use of its aging management program "One Time Inspection" (LRA B.1.29). The GALL Report recommends that this aging process be managed through the use of the aging management program "Open Cycle Cooling Water System" (GALL Report Vol. 2 XI.M20). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.3.1-79 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its consideration of these aging management review items, the staff notes that the One Time Inspection AMP is designed to be used when the environment to which a system, structure or component is exposed is invariant with time, for example treated water systems where the water chemistry is frequently monitored and carefully controlled. In such systems, the lack of prior corrosion may be an indicator that future corrosion will not occur. Raw water systems cannot be considered to be invariant with time in terms of chemistry or microbiology. Since stainless steel is highly susceptible to microbiological corrosion and since microbiological corrosion can occur rapidly, the absence of past corrosion cannot be considered a reliable predictor of future corrosion. The staff also notes that the structures, systems, and components under consideration appear to be subject to Generic Letter 89-13 and that a one time inspection of these components appears to be inconsistent with the requirements of the Generic Letter.

Request
Please propose a program to manage the aging of the components under consideration which is consistent with Generic Letter 89-13, which recognizes the variability of the chemistry and microbiology of raw water, and which acknowledges the inability to use past corrosion performance as an indicator of future corrosion under such circumstances.

Clarification:
Based on the discussion on the clarification, the staff agreed to revise the RAI as follow:

Issue
In its review of LRA Table 3.3.1-79, the staff noted that the One Time Inspection Aging Management Program is designed to be used when the environment to which a system, structure or component is exposed is invariant with time, for example treated water systems where the water chemistry is frequently monitored and carefully controlled. In such systems, the lack of prior corrosion may be an indicator that future corrosion will not occur. Raw water

systems, including any untreated and substantially unmonitored water system, cannot be considered to be invariant with time in terms of chemistry or microbiology.

Request
Please propose a program to manage the aging of the components under consideration which recognizes the variability of the chemistry and microbiology of raw water, and which acknowledges the inability to use past corrosion performance as an indicator of future corrosion under such circumstances.

RAI 3.3.2.1-6 (Draft)

Background
LRA and SRP Tables 3.3.1-81 address the loss of material due to pitting, crevice, and microbiologically influenced corrosion for copper alloy piping, piping components, and piping elements exposed to raw water. The applicant proposes to manage this aging process through the use of its aging management program "Periodic Surveillance and Preventive Maintenance" (LRA B.1.31). The GALL Report recommends that this aging process be managed through the use of the aging management program "Open Cycle Cooling Water System" (GALL Report Vol. 2 XI.M20). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.2.1-81 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its consideration of these aging management review items, the staff noted that it is not obvious that all the service water system components under consideration are specifically included in the proposed aging management program. The staff also noted that the aging management program recommended by the GALL Report addresses inspection, performance testing, and materials of construction of piping while the program proposed by the applicant is only an inspection program which may or may not inspect the internal surfaces of the subject piping. The staff questions whether the proposed aging management program will adequately address the loss of heat transfer due to fouling of the components being considered.

Also in its evaluation of these AMR items, the staff noted that one of the components listed, coil, heating and cooling, (LRA table 3.3.2-13) is not piping but rather a heat exchanger component. This item may be better addressed under SRP Table 3.3-1 item 82.

Request
Please clarify how the proposed program will manage loss of heat transfer due to fouling of the components being considered. Additionally please review Table 3.3.2-13 to determine the best Table 1 AMR item under which to report the Coil, heating or cooling for the aging effect "loss of material."

Clarification:
The applicant clarified that service water (SW) piping are managed by SW integrity as shown in LRA Table 3.3.2-3 with a code. Also Table 1 item listed for the coil noted in LRA table 3.3.2-13 is item 3.3.1-83 as shown. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 3.3.2.1-7 (Draft)

Background
LRA and SRP Tables 3.3.1-83 address the reduction of heat transfer due to fouling of stainless steel and copper alloy heat exchanger tubes exposed to raw water. The applicant proposes to manage this aging process through the use of its aging management program "Periodic Surveillance and Preventive Maintenance" (LRA B.1.31). The GALL Report recommends that this aging process be managed through the use of the aging management program "Open Cycle Cooling Water System" (GALL Report Vol. 2 XI.M20). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.2.1-83 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its consideration of these aging management review items, the staff notes that it is not obvious that the service water system components under consideration are specifically included in the proposed aging management program. The staff also noted that the aging management program recommended by the GALL Report addresses inspection, performance testing, and materials of construction of piping while the program proposed by the applicant is only an inspection program which may or may not inspect the internal surfaces of the subject piping. The staff questions whether the proposed aging management program will adequately address the loss of heat transfer due to fouling of the components being considered.

Also in its evaluation of these AMR items, the staff noted that copper alloy and stainless steel heat exchanger tubes and/or components are subject to aging effects other than loss of heat transfer due to fouling, e.g., loss of material due to pitting, crevice, and microbiologically influenced corrosion or selective leaching (SRP table 3.3-1 items 82 and 84). AMR line items considering these aging affects appear to be absent from the application.

Request
Please clarify how the proposed program will manage loss of heat transfer due to fouling of the components being considered. Additionally, please provide AMR items addressing other aging effects to which heat exchanger tubes/components will be subjected or justify why such aging effects need not be considered.

Clarification:
Based on the discussion on the clarification, the staff agreed to revise the RAI as follow:

Issue
In its review of LRA Table 3.3.1-83, the staff noted that the item under consideration is heating/cooling coil serving the nitrogen system. The staff also noted that the aging effect under consideration is loss of heat transfer due to fouling. Based on the information presented in the application, the staff must assume that the applicant correctly chose to apply Table 3.3.1-83 to this component. In the absence of additional information, the staff must also assume that generic letter 89-13 applies to the component under consideration.

Request
Please propose an aging management program equivalent to the open cycle cooling water AMP or justify why generic letter 89-13 does not apply to this system. This justification should include a complete description of the water system associated with the nitrogen system including the water source and its typical chemical composition.

RAI 3.3.2.1-8 (Draft)

Background
LRA and SRP Tables 3.4.1-32 address the loss of material due to pitting, crevice, and microbiologically influenced corrosion as well as fouling for stainless steel and copper alloy piping, piping components, and piping elements exposed to raw water. The applicant proposes to manage this aging process through the use of its aging management program "Periodic Surveillance and Preventive Maintenance" (LRA B.1.31). The GALL Report recommends that this aging process be managed through the use of the aging management program "Open Cycle Cooling Water System" (GALL Report Vol. 2 XI.M20). The proposed aging management program is not consistent with the aging management program proposed by the GALL report. As a result, the applicant proposes that the aging management review items associated with Table 3.4.1-32 are consistent with the GALL Report in terms of material, environment, and aging effect but a different aging management program is credited (generic note E).

Issue
In its consideration of these aging management review items, the staff noted that it is not obvious that all the service water system components under consideration are specifically included in the proposed aging management program. The staff also noted that the aging management program recommended by the GALL Report addresses inspection, performance testing, and materials of construction of piping while the program proposed by the applicant is only an inspection program which may or may not inspect the internal surfaces of the subject piping. The staff questions whether the proposed aging management program will adequately address the loss of heat transfer due to fouling of the components being considered.

Request
Please clarify how the proposed aging management program will adequately address the loss of heat transfer due to fouling of the components being considered.

Clarification:
The applicant clarified that heat transfer is not an intended function for these items. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 2.3.3.6-5 (Draft)

Section 4.4.2, "Filters," of the CNS Safety Evaluation Report, dated May 23, 1979, states that "…Automatic water spray fire protection system[s] have been provided to protect the charcoal filters in the standby gas treatment filter unit and in the augmented radwaste building ventilation filter unit…" The staff requests that the applicant verify whether the automatic water spray fire protection system is in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If automatic water spray fire protection system and associated components are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

Clarification
The applicant clarified that the requested information is provided in the LRA with the relevant drawing. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 2.3.3.6-6 (Draft)

The Safety Evaluation Report, dated May 23, 1979, listed various types fire water suppression systems provided in the plant areas for fire suppression activities. The fire suppression systems in various areas are:

- Instrument Storage Room – Automatic sprinkler system
- Laundry Room and Control Access Corridor – Automatic sprinkler system
- Air Compressor – Control Building Basement – Manual foam system
- Cable Expansion Room - Automatic suppression system
- Vertical Electrical Cable Chase and Penetration in the North Wall of the Turbine Building – Automatic sprinkler system
- Reactor Building Elevation 903'-6"- Automatic suppression system
- Reactor Building Elevation 932'-6"- MG set oil coolers automatic suppression system
- Reactor Building Elevation 958'-3"- Wet pipe sprinkler system
- Reactor Building Elevation 976'-0"- MG sets pre-action sprinkler system

The staff requests that the applicant verify whether the above fire suppression systems installed in the above areas of the plant are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If any is excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

Clarification
The applicant clarified that the requested information is provided in the LRA with the relevant drawing. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 2.3.3.6-7 (Draft)

LRA Table 2.3.3.6 excludes several types of fire protection components that appear in the Safety Evaluation Report dated May 23, 1979. These components are listed below:

- dikes for oil spill confinement
- floor drains and curbs for fire water
- pipe fittings
- pipe supports

For each, determine whether the component should be included in Tables 2.3.3-6 and 3.3.2-6, and, if not, justify the exclusion.

Clarification:
The applicant clarified that the requested information is provided in the LRA and pipe fittings are part of PIPING in LRA pg 2.0-1. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 3.3-1 (Draft)

Background
On LRA page 3.3-216 through 3.3-217 of LRA Table 3.3.2-14-17, the applicant lists copper alloy tubing, piping and valve bodies exposed to a treated water (internal) environment as being susceptible to loss of material. The applicant credits its Periodic Surveillance and Preventative Maintenance program to manage loss of material of the internal surfaces and references GALL AMR Item# VII.G-24 and LRA Table 3.3.1 Item# 3.3.1-68.

Issue
The staff noted that GALL AMR Item# VII.G-24 is applicable to steel piping, piping components and piping elements exposed to raw water and the discrepancy between the applicant's AMR items and the references made by these items.

Request
Please clarify the applicability of GALL AMR Item# VII.G-24 to the AMR items on LRA page 3.3-216 through 3.3-217.

Please clarify whether or not the program provides a set schedule for the inspections of the internal surfaces of these copper alloy components, and explain why the inspection methods and frequency for the examinations are considered to be adequate to detect and manage loss of material in their internal component surfaces.

Clarification:
During the conference call, the applicant indicated that the information requested is provided in the LRA. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 3.3-2 (Draft)

Background
In LRA Table 3.3.2-13: Nitrogen System, it states that piping, piping component, piping elements and heat exchanger components fabricated of copper alloy and/or stainless steel are not subject to an aging effect requiring management when exposed to liquid nitrogen, therefore an aging management program is not applicable.

Issue
The applicant did not provide a justification for determining these materials are not subject to an aging effect requiring management when exposed to liquid nitrogen in the LRA. The staff is concerned that exposure to liquid nitrogen conditions will subject the copper and stainless steel materials to extremely low temperature conditions which may affect the material's properties, and requiring aging management.

Request
Please provide a justification for the conclusion that there are no aging effects requiring management for these components when exposed to liquid nitrogen. Please provide supporting references.

Clarification:
Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 3.3-3 (Draft)

Background
In LRA Table 3.3.2-4, tubing and valve bodies fabricated from stainless steel exposed to condensation (internal) credit the Periodic Surveillance and Preventive Maintenance program. In LRA Table 3.3.2-14-25, tubing and valve bodies fabricated from stainless steel exposed to condensation (internal) credit the One-Inspection program. In both instances the AMR line items refer to GALL AMR Item# VII.D-4 and LRA Table 3.3.1 Item# 3.3.1-54. The GALL Report recommends GALL AMP XI.M24 "Compressed Air Monitoring" which includes (a) frequent leak testing of valves, piping, and other system components, especially those made of carbon steel and stainless steel; and (b) preventive monitoring that checks air quality at various locations in the system to ensure that oil, water, rust, dirt, and other contaminants are kept within the specified limits.

Issue
It is not clear to the staff how the inspections performed by the Periodic Surveillance and Preventive Maintenance program or the One-Time Inspection program will substitute the recommendations of GALL AMP XI.M24 "Compressed Air Monitoring".

Request
Please justify the use of the Periodic Surveillance and Preventive Maintenance program in the Diesel Generator System and the One-Time Inspection program in the Service Air System for aging management, which will only perform visual and/or NDE inspections, in lieu of GALL AMP XI.M24, which include leak testing and checks for air quality.

Clarification:
During the conference call, the applicant indicated that the information requested is provided in the response for RAI 3.3.2.1-1 and RAI 3.3.2.1-2. Based on the discussion on the clarification, the staff agreed to re-examine this issue. The staff determined that issuance of this RAI is warranted..

RAI 3.3-5 (Draft)

Background
LRA Table 3.3.1 Item # 3.3.1-47 is applicable to steel, 3.3.1-50 is applicable to stainless steel, and 3.3.1-51, is applicable to copper alloy, to manage loss of material when exposed to closed cycle cooling water. Some of these AMR line items credit the Water Chemistry Control – Auxiliary Systems program to manage the effects of aging. The GALL Report recommends XI.M21 "Closed-Cycle Cooling Water System" which includes corrosion inhibitor concentrations, periodic performance and functional testing, and periodic internal visual inspections in accordance with EPRI TR-107396.

Issue
For those AMR line items which credit the Water Chemistry Control – Auxiliary Systems program for aging management in the LRA, it is not clear to the staff whether this program is sufficient for aging management.

Request

1. Please clarify if in all instances where the Water Chemistry Control – Auxiliary Systems program is credited, the One-Time Inspection program is also credited.
2. Please justify the use of the program(s) credited for aging management in lieu of the GALL Report recommendations of periodic performance and functional testing, periodic internal visual inspections and the addition of corrosion inhibitor concentrations, in addition to the water chemistry impurity monitoring.

Clarification
During the conference call, the applicant indicated that the information requested is provided in the response for RAI B.1.38 -1. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 3.3-6 (Draft)

Background
In LRA Table 3.3.2-14-2, the Water Chemistry Control – Auxiliary Systems program is credited for aging management of stainless steel valve body and tubing exposed to a steam (internal) environment for loss of material and reference LRA Table 3.4.1 Item # 3.4.1-37 and GALL Item # VIII.A-13. The GALL Report recommends XI.M2 "Water Chemistry" for aging management which references EPRI TR-103515 or later revisions for BWRs.

Issue
It is not clear to the staff if the parameters monitored and maintained by the Water Chemistry Control – Auxiliary Systems program are sufficient for aging management of these components.

Request
Please justify the use of the Water Chemistry Control – Auxiliary Systems program for aging management and the parameters that are monitored and maintained by this program to prevent loss of material in stainless steel components when exposed to steam (internal).

Clarification
During the conference call, the applicant indicated that the information requested is provided in the response for RAI B.1.38-1 and RAI B.1.38-2. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 3.3-7 (Draft)

Background
For the following descriptions please answer the questions that follow:

1. In LRA Table 3.3.2-12 the Periodic Surveillance and Preventative Maintenance program was credited for managing loss of material for gray cast iron pump casings in an air-indoor (internal) environment and reference LRA Table 3.2.1 Item # 3.2.1-32 and GALL AMR Item # V.D2-16.
2. In LRA Table 3.3.2-13 the External Surfaces Monitoring program was credited for managing loss of material for gray cast iron valve bodies in an air-indoor (internal) environment was credited for managing for loss of material and reference LRA Table 3.2.1 Item # 3.2.1-32 and GALL AMR Item # V.D2-16.

3. In LRA Table 3.3.2-05 the External Surfaces Monitoring program was credited for managing loss of material for gray cast iron flame arrestors in an air-outdoor (internal) environment and reference LRA Table 3.4.1 Item # 3.4.1-30 and GALL AMR Item # VIII.B1-6.
4. The GALL Report recommends the program XI.M38 "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components" for aging management each instance described above.

Issue
The program descriptions of the Periodic Surveillance and Preventative Maintenance program and External Surfaces Monitoring program state these programs are credited for managing loss of material for the internal surface for situations where the external and internal material and environment combinations are the same such that the external surface is representative of the internal surface condition. It is unclear to the staff if the conditions of the internal and external environment of these components are the same, because the internal environment may contain contaminants and stagnant air which is not the same as freely circulating air on the external surface.

Request
Please describe in detail the conditions that exist in the internal environment of the components described above and how it compares with the external environment. Also, please justify the credited AMPs ability to manage aging of the internal surface by visually inspecting the external surface, in lieu of as the program recommended by the GALL Report.

Clarification
Based on the discussion on the clarification, the applicant indicated understanding of this RAI.

RAI 3.3-8 (Draft)

Background
LRA Table 3.3.2-12 credits the Periodic Surveillance and Preventative Maintenance program to manage aging for gray cast iron pump casings in an air-indoor (external) environment for loss of material. These AMR result line items reference LRA Table 3.3.1 Item # 3.3.1-58 and GALL AMR Item # VII.I-8. The GALL Report recommends the program XI.M36 "External Surfaces Monitoring" for aging management.

Issue
GALL AMP XI.M36 states that inspections of component surfaces are normally performed on a frequency of at least once per fuel cycle and the intervals may be adjusted as necessary based on plant-specific inspection results and industry experience. LRA Section B.1.31 states that “Each inspection or test occurs at least once every five years.” It is not clear to the staff exactly what the frequency of inspection will be for external surfaces of these pump casings.

Request
Please clarify what the inspection/testing frequency will be for these pump casings and justify the frequency that is selected for aging management if it is not at least once per fuel cycle.

Clarification:
During the conference call, the applicant indicated that the information requested is provided in the LRA (why 5 years frequency is acceptable and that the applicant may choose to perform more often). Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 3.3-9 (Draft)

Background
LRA Section 3.3.2.2.12.1 states that the diesel driven fire pump fuel supply line will be managed by the Diesel Fuel Monitoring program and the Fire Protection program. The GALL Report recommends that the use of a one-time inspection, which consists of a visual inspection or nondestructive examination, to confirm the effectiveness of the Diesel Fuel Monitoring program.

Issue
LRA Section 3.3.2.2.12.1 and LRA Section B.1.16, “Fire Protection” does not describe the details of the periodic inspections that will be performed for the diesel driven fire pump fuel supply line. It is not clear to staff if the periodic inspections performed as part of the Fire Protection program, consist of the visual inspection or nondestructive examination, that will be capable of examining the condition of the internal surface of the diesel driven fire pump fuel supply line and verifying the effectiveness of the Diesel Fuel Monitoring program, as recommended by the GALL Report.

Request
Justify the use of the Fire Protection program to manage aging of the diesel driven fire pump fuel supply line, if the periodic inspections do not consist of a visual inspection or nondestructive examination that will be capable of examining the condition of the internal surface of the diesel driven fire pump fuel supply line and verifying the effectiveness of the Diesel Fuel Monitoring program.

Clarification
During the conference call, the applicant indicated that the CNS supply line is copper not steel. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.

RAI 3.1-1 (Draft)

Background
In LRA Table 3.1.2-1, there are several low-alloy steel with stainless steel clad components that reference LRA Table 3.1.1 Item # 3.1.1-41 and credit only the Inservice Inspection Program and the Water Chemistry Control – BWR program. For these items the GALL Report recommends the use of GALL AMP XI.M7 "BWR Stress Corrosion Cracking" and GALL AMP XI.M2 “Water Chemistry” to manage aging.

Issue
The discussion for LRA Table 3.1.1 Item # 3.1.1-41 states that some components, to which the BWR Stress Corrosion Cracking Program is not applicable, cracking is managed by the Water Chemistry Control – BWR Program and the Inservice Inspection Program. The applicant did not provide an explanation as to why these components are not applicable to GALL AMP XI.M7 "BWR Stress Corrosion Cracking."

Request
Provide an explanation/justification why the above mentioned components are not applicable to the GALL AMP XI.M7 "BWR Stress Corrosion Cracking" program. Please be specific when identifying the components and the appropriate justification for individual components.

Clarification: during the conference call, the applicant indicated that the information requested is provided in the response for RAI B.1.7-1. Based on the discussion on the clarification, the staff agreed to withdraw this RAI.