UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 26, 2011

LICENSEE: PSEG Nuclear, LLC

FACILITY: Salem Nuclear Generating Station, Units 1 and 2

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON MAY 10, 2011, BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION AND PSEG NUCLEAR, LLC, CONCERNING A DRAFT RESPONSE TO A DRAFT REQUEST FOR ADDITIONAL INFORMATION PERTAINING TO THE SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2, (SALEM) LICENSE RENEWAL APPLICATION

The U.S. Nuclear Regulatory Commission (NRC or the staff) and representatives of PSEG Nuclear, LLC (the applicant), and Exelon held a telephone conference call on May 10, 2011, to discuss the applicant's draft response to the staff's request for additional information (D-RAI) 3.2.1.48. The telephone conference call was useful in clarifying the intent of the applicant's D-RAI response.

Enclosure 1 provides a listing of the participants. Enclosure 2 contains a brief summary of the discussion and status of the items. Enclosure 3 includes the applicant's response to the D-RAI.

The applicant had an opportunity to comment on this summary.

Samuel Cuadrado de Jesús, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

Enclosures:
As stated

cc w/encls: Listserv

TELEPHONE CONFERENCE CALL
SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2
LICENSE RENEWAL APPLICATION
LIST OF PARTICIPANTS

May 10, 2011

PARTICIPANTS	AFFILIATIONS
Samuel Cuadrado de Jesús	U.S. Nuclear Regulatory Commission (NRC)
Bennett Brady	NRC
John Wise	NRC
William Holston	NRC
Phillip O'Donnell	Exelon
Albert Piha	Exelon
Kevin Muggleston	PSEG Nuclear (Contractor)

ENCLOSURE 1

SUMMARY OF MEETING ON A DRAFT RAI RESPONSE FOR
SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION

MAY 10, 2011

The U.S. Nuclear Regulatory Commission (NRC or the staff) and representatives of PSEG Nuclear, LLC (the applicant) held a telephone conference call on May 10, 2011, to discuss the applicant's draft response to the staff's draft request for additional information (D-RAI) 3.2.1.48 regarding the aging management of stainless steel components and steel components with stainless steel cladding exposed to treated borated water with high oxygen content.

Discussion

The staff stated that after reviewing the applicant's response to D-RAI 3.2.1.48 clarification was needed regarding one line item on Table 3.2.2-3 of the LRA. Specifically the staff found that the applicant chose not to add a one-time inspection for the restricting orifices (class-one) component for which loss of material in treated borated water is managed by the Water Chemistry Program (referring to Table 1 item 3.2.1-49). The staff stated that looking at the plant drawings, it is not clear whether this orifice is normally exposed to an oxygen-scavenged reactor coolant environment, or whether it may actually be isolated between valves in an air-saturated reactor coolant environment. The staff further stated that if the orifice is exposed to high-oxygen water an additional program, like the one-time inspection, should be added for verification. The staff asked the applicant to explain why they didn't add the one-time inspection program to the restricting orifices (class-one) components.

The applicant stated that those components were isolated and that their assumption was that over time oxygen will deplete. The staff stated that it was not clear whether this assumption was valid and, even under this scenario, the mechanism of oxygen depletion may be corrosion. Thus, the staff recommended that a verification program be added to these components. The applicant agreed to add the one-time inspection to these components and will update their D-RAI response to reflect that in their final LRA supplement letter.

ENCLOSURE 2

10 CFR 50
10 CFR 51
10 CFR 54

LR-N11-0148

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Salem Nuclear Generating Station, Unit No. 1 and Unit No. 2
Facility Operating License Nos. DPR-70 and DPR-75
NRC Docket Nos. 50-272 and 50-311

Subject: Supplement to the Salem Nuclear Generating Station, Unit No. 1 and Unit No. 2 License Renewal Application to address Treated Borated Water Environments

Reference: NRC Draft RAI 3.2.1.48 and associated May 5, 2011 Teleconference between NRC Staff and PSEG Nuclear LLC related to Salem Nuclear Generating Station, Unit No. 1 and Unit No. 2 License Renewal

The NRC Staff contacted PSEG Nuclear LLC (PSEG) related to a determination made by Staff that the guidance in the Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants (SRP-LR) and Generic Aging Lessons Learned (GALL) Report does not adequately address aging management in treated borated water environments that contain dissolved oxygen above a 100 ppb threshold. Based on this determination, the Staff made three specific requests of PSEG to ensure that the Salem LRA adequately addresses this issue.

Enclosure A provides the NRC requests and the associated PSEG responses. Enclosure B contains updated sections of the Salem LRA.

A minor revision to License Renewal commitment #20 is made to reflect this change, as shown on page 30 of Enclosure B. There are no other new or revised regulatory commitments contained in this letter.

If you have any questions, please contact Mr. Ali Fakhar, PSEG Manager - License Renewal, at 856-339-1646.

ENCLOSURE 3

I declare under penalty of perjury that the foregoing is true and correct.

Executed on _____

Sincerely,

Paul J. Davison
Vice President, Operations Support
PSEG Nuclear LLC

Enclosures: A. Response to draft RAI associated with Salem Nuclear Generating Station, Unit No. 1 and Unit No. 2 License Renewal Application

B. Changes to Salem Nuclear Generating Station, Unit No. 1 and Unit No. 2 License Renewal Application

cc: William M. Dean, Regional Administrator – USNRC Region I
Bennett Brady, Senior Project Manager, License Renewal – USNRC
Samuel CuadradoDeJesus, Project Manager, License Renewal - USNRC
R. Ennis, Project Manager - USNRC
NRC Senior Resident Inspector - Salem
P. Mulligan, Manager IV, NJBNE
L. Marabella, Corporate Commitment Tracking Coordinator
H. Berrick, Salem Commitment Tracking Coordinator

Draft RAI 3.2.1.48

Background

The staff has determined that existing guidance in the Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants (SRP-LR) and Generic Aging Lessons Learned (GALL) Report does not adequately address aging management in treated borated water environments that contain dissolved oxygen above a 100 ppb threshold. Specifically, for pressurized water reactors (PWRs), the guidance recommends using the Water Chemistry Program only for aging management of loss of material due to pitting and crevice corrosion and cracking due to stress corrosion cracking in stainless steel components exposed to treated borated water, whereas the combination of the Water Chemistry Program and One-Time Inspection Program is used for boiling water reactor (BWR) treated water environments.

In its development of the GALL Report, the staff originally attributed the lesser corrosiveness of PWR primary water (treated borated) relative to that of BWR primary water (treated) to the presence of boron. However, the low corrosiveness of PWR primary water is not due to the presence of boron, but rather very low dissolved oxygen levels and other chemistry controls. The boron compounds in treated borated water are not actively managed to ensure that they are in a form or of an appropriate concentration to inhibit corrosion. Thus, SSCs exposed to an environment of treated borated water with elevated oxygen should be age managed by a combination of the Water Chemistry Program and One-Time Inspection Program to account for the greater corrosiveness, regardless of whether the water is borated.

In the LRA, the applicant stated that stainless steel and steel with stainless steel cladding components exposed to treated borated water will be managed for loss of material due to pitting and crevice corrosion and cracking due to stress corrosion cracking with the Water Chemistry Program for those items associated with LRA Table 3.2.1, item 3.2.1-48; Table 3.2.1, item 3.2.1-49; Table 3.3.1, item 3.3.1-90; and Table 3.3.1, item 3.3.1-91.

Issue

1. The staff noted that several AMR items reference the LRA Table 3.2.1 and 3.3.1 items above; however, the associated treated borated water environments may not be controlled to less than 100 ppb dissolved oxygen, and thus, the aging effects may not be effectively managed. Examples of applicable systems in the LRA include, but are not limited to, the containment spray system, safety injection system, and the spent fuel cooling system.

2. The staff believes that the UFSAR Supplement should include AMP changes that address the updated staff guidance to ensure that the licensing basis for the period of extended operation is clear.

Request

1. Identify the AMR items that use only the Water Chemistry Program to age manage stainless steel and steel with stainless steel cladding components exposed to treated borated water with greater than 100 ppb oxygen for loss of material due to pitting and crevice corrosion and cracking due to stress corrosion cracking.

2. For the identified items, state how the effectiveness of the Water Chemistry Program will be verified.

3. Update the UFSAR Supplement for the Water Chemistry Program, and the program used to verify its effectiveness, to ensure that the usage of these programs to manage treated borated water with greater than 100 ppb oxygen is reflected in the licensing basis for the period of extended operation.

PSEG Response:

1. Enclosure B identifies the AMR items that use only the Water Chemistry Program to age manage stainless steel and steel with stainless steel cladding components exposed to treated borated water with greater than 100 ppb oxygen for loss of material due to pitting and crevice corrosion and cracking due to stress corrosion cracking.

2. As shown in the AMR tables in Enclosure B, the One-Time Inspection Program will be used to verify the effectiveness of the Water Chemistry Program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.

3. Enclosure B provides the PSEG update to the UFSAR Supplement for the Water Chemistry Program, and the One-Time Inspection Program used to verify its effectiveness, to ensure that the usage of these programs to manage treated borated water with greater than 100 ppb oxygen is reflected in the licensing basis for the period of extended operation.

Enclosure B

Salem Generating Station License Renewal Application (LRA) Changes

The PSEG response results in changes to the LRA. The affected LRA Sections and Enclosure pages for the associated LRA Section markups are identified below. For clarity, portions of the original LRA, as updated by subsequent PSEG Nuclear license renewal correspondence, are repeated in this Enclosure. Added text is shown in ***Bold Italics***, and deletions are shown with strikethrough text.

3.2.2.2.3 Loss of Material due to Pitting and Crevice Corrosion

1. *Loss of material due to pitting and crevice corrosion could occur for internal surfaces of stainless steel containment isolation piping, piping components, and piping elements exposed to treated water. The existing AMP relies on monitoring and control of water chemistry to mitigate degradation. However, control of water chemistry does not preclude loss of material due to pitting and crevice corrosion at locations of stagnant flow conditions. Therefore, the effectiveness of the chemistry control program should be verified to ensure that corrosion is not occurring. The GALL Report recommends further evaluation of programs to verify the effectiveness of the chemistry control program. A one-time inspection of select components at susceptible locations is an acceptable method to determine whether an aging effect is not occurring or an aging effect is progressing very slowly such that the component's intended function will be maintained during the period of extended operation.*

   Item Number 3.2.1-3 is not applicable to Salem. The stainless steel piping and piping components internal surfaces in the Engineered Safety Features are exposed to treated borated water and are evaluated with Item Number 3.2.1-49. Water Chemistry program activities provide for monitoring and controlling the chemical environments of the primary cycle systems in accordance with EPRI, Pressurized Water Reactor Primary Chemistry Guidelines. The Water Chemistry program activities mitigate the loss of material aging effect to ensure there is no loss of component intended function. ***The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.***

Table 3.2.1 Summary of Aging Management Evaluations for the Engineered Safety Features

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.2.1-48	Stainless steel or stainless-steel-clad steel piping, piping components, piping elements, and tanks (including safety injection tanks/accumulators) exposed to treated borated water >60°C (>140°F)	Cracking due to stress corrosion cracking	Water Chemistry	No	Consistent with NUREG-1801. The Water Chemistry program, B.2.1.2, will be used to manage the effects of cracking due to stress corrosion cracking in stainless steel piping, piping components, and piping elements exposed to treated borated water >140°F in the Chemical & Volume Control System, Residual Heat Removal System, and Safety Injection System. The Safety Injection Accumulators are exposed to treated borated water less than 140°F, and are included in Item Number 3.2.1-49. ***The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program to manage cracking of stainless steel components in the Residual Heat Removal System, and Safety Injection System, where dissolved oxygen may not be controlled to less than 100 ppb.***
3.2.1-49	Stainless steel piping, piping components, piping elements, and tanks exposed to treated borated water	Loss of material due to pitting and crevice corrosion	Water Chemistry	No	Consistent with NUREG-1801. The Water Chemistry program, B.2.1.2, will be used to manage loss of material due to pitting and crevice corrosion in stainless steel piping, piping components, piping elements, heat exchangers, and tanks exposed to treated borated water in the Chemical & Volume Control System, Containment Spray System, Residual Heat Removal System, and Safety Injection System. ***The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program to manage loss of material in stainless steel components in the Containment Spray System, Residual Heat Removal System, and Safety Injection System, where dissolved oxygen may not be controlled to less than 100 ppb.***

Table 3.2.2-1 Containment Spray System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Eductor	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Eductor	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 2***
Flow Device	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Flow Device	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 2***
Flow Element	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Flow Element	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 2***
Piping and Fittings	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Piping and Fittings	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 2***
Pump Casing (Containment Spray Pumps)	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.A-27	3.2.1-49	A
Pump Casing (Containment Spray Pumps)	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.A-27***	***3.2.1-49***	***E, 2***
Strainer Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Strainer Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 2***
Valve Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Valve Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 2***

Plant Specific Notes:

2. The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.

Table 3.2.2-2 Residual Heat Removal System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Element	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Flow Element	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 4***
Flow Element	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Flow Element	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 4***
Piping and Fittings	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Piping and Fittings	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 4***
Piping and Fittings	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Piping and Fittings	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 4***
Piping and Fittings	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Piping and Fittings	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 4***
Piping and Fittings	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Piping and Fittings	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 4***
Pump Casing (Letdown Booster Pump)	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Pump Casing (Letdown Booster Pump)	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 4***

Table 3.2.2-2 Residual Heat Removal System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump Casing (Letdown Booster Pump)	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Pump Casing (Letdown Booster Pump)	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 4***
Pump Casing (Residual Heat Removal)	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Pump Casing (Residual Heat Removal)	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 4***
Pump Casing (Residual Heat Removal)	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Pump Casing (Residual Heat Removal)	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 4***
Restricting Orifices	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Restricting Orifices	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 4***
Restricting Orifices	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Restricting Orifices	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 4***
Restricting Orifices	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Restricting Orifices	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 4***
Restricting Orifices	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Restricting Orifices	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 4***

Table 3.2.2-2 Residual Heat Removal System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Restricting Orifices	Throttle	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Restricting Orifices	***Throttle***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 4***
Restricting Orifices	Throttle	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Restricting Orifices	***Throttle***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 4***
Strainer Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Strainer Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 4***
Strainer Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Strainer Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 4***
Thermowell	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Thermowell	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 4***
Thermowell	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Thermowell	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 4***
Valve Body	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Valve Body	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 4***
Valve Body	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Valve Body	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 4***

Table 3.2.2-2 Residual Heat Removal System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Valve Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 4***
Valve Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Valve Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 4***

Plant Specific Notes:

4. The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.

Table 3.2.2-3 Safety Injection System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Class 1 Piping, Fittings and Branch Connections < NPS 4"	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Class 1 Piping, Fittings and Branch Connections < NPS 4"	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Flow Element	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Flow Element	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Heat Exchanger Components (Refueling Water Storage Tank)	Pressure Boundary	Stainless Steel (Shellside Components)	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	C
Heat Exchanger Components (Refueling Water Storage Tank)	***Pressure Boundary***	***Stainless Steel (Shellside Components)***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Heat Exchanger Components (Refueling Water Storage Tank)	Pressure Boundary	Stainless Steel (Tube Sheet)	Treated Borated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	C
Heat Exchanger Components (Refueling Water Storage Tank)	***Pressure Boundary***	***Stainless Steel (Tube Sheet)***	***Treated Borated Water (External)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***

Table 3.2.2-3 Safety Injection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger Components (Refueling Water Storage Tank)	Pressure Boundary	Stainless Steel (Tubes)	Treated Borated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	C
Heat Exchanger Components (Refueling Water Storage Tank)	***Pressure Boundary***	***Stainless Steel (Tubes)***	***Treated Borated Water (External)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Piping and Fittings	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Piping and Fittings	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Piping and Fittings	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Piping and Fittings	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 8***
Piping and Fittings	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Piping and Fittings	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Pump Casing (RWST Heating Circulator)	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Pump Casing (RWST Heating Circulator)	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Pump Casing (Safety Injection)	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Pump Casing (Safety Injection)	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***

Table 3.2.2-3 Safety Injection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Restricting Orifices	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Restricting Orifices	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Restricting Orifices	Throttle	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Restricting Orifices	***Throttle***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Strainer Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Strainer Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Tanks (Boron Injection Tank)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Tanks (Boron Injection Tank)	***Pressure Boundary***	***Carbon or Low Alloy Steel with Stainless Steel Cladding***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Tanks (Refueling Water Storage Tank)	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Tanks (Refueling Water Storage Tank)	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Tanks (Safety Injection Accumulators)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Tanks (Safety Injection Accumulators)	***Pressure Boundary***	***Carbon or Low Alloy Steel with Stainless Steel Cladding***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***

Table 3.2.2-3 Safety Injection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Valve Body	***Pressure Boundary***	***Carbon or Low Alloy Steel with Stainless Steel Cladding***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Valve Body	***Pressure Boundary***	***Cast Austenitic Stainless Steel (CASS)***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 8***
Valve Body	Pressure Boundary	Cast Austenitic Stainless Steel (CASS)	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Valve Body	***Pressure Boundary***	***Cast Austenitic Stainless Steel (CASS)***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Valve Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Valve Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***
Valve Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	V.D1-31	3.2.1-48	A
Valve Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***V.D1-31***	***3.2.1-48***	***E, 8***
Valve Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	V.D1-30	3.2.1-49	A
Valve Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***V.D1-30***	***3.2.1-49***	***E, 8***

Plant Specific Notes:

8. The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-90	Stainless steel and steel with stainless steel cladding piping, piping components, piping elements, tanks, and fuel storage racks exposed to treated borated water >60°C (>140°F)	Cracking due to stress corrosion cracking	Water Chemistry	No	Consistent with NUREG-1801. The Water Chemistry program, B.2.1.2, will be used to manage cracking due to stress corrosion cracking of the stainless steel piping, piping components, piping elements, heat exchanger components, and tanks exposed to treated borated water >60°C (>140°F) for the Component Cooling System, Radwaste System, and Sampling System. ***The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program to manage cracking of stainless steel components in the Component Cooling System, Radwaste System, and Sampling System, where dissolved oxygen may not be controlled to less than 100 ppb.***

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1-91	Stainless steel and steel with stainless steel cladding piping, piping components, and piping elements exposed to treated borated water	Loss of material due to pitting and crevice corrosion	Water Chemistry	No	Consistent with NUREG-1801. The Water Chemistry program, B.2.1.2, will be used to manage loss of material due to pitting and crevice corrosion of the stainless steel and steel with stainless steel cladding piping, piping components, piping elements, heat exchanger components, cranes and hoists, fuel storage racks, tanks, liners, penetration bellows and other structural components exposed to treated borated water for the Chemical & Volume Control System, Component Cooling System, Fuel Handling and Fuel Storage System, Radwaste System, Sampling System, Spent Fuel Cooling System, Component Supports Commodity Group, Containment Structure, and Fuel Handling Building. ***The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program to manage loss of material in stainless steel components in the Component Cooling System, Fuel Handling and Fuel Storage System, Radwaste System, Sampling System, Spent Fuel Cooling System, Containment Structure, and Fuel Handling Building, where dissolved oxygen may not be controlled to less than 100 ppb.*** Components in the Component Supports Commodity Group have been aligned to this item number based upon material, environment and aging effect. The ASME Section XI, Subsection IWF program, B.2.1.30, will be added to manage loss of material due to pitting and crevice corrosion for the support members, welds, bolted connections, and support anchorages to building structure for the Component Supports Commodity Group.

Table 3.3.2-5 Component Cooling System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger Components (Residual Heat Removal)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding (Tubesheet)	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	C
Heat Exchanger Components (Residual Heat Removal)	***Pressure Boundary***	***Carbon or Low Alloy Steel with Stainless Steel Cladding (Tubesheet)***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 8***
Heat Exchanger Components (Residual Heat Removal)	Pressure Boundary	Carbon or Low Alloy Steel with Stainless Steel Cladding (Tubeside Components)	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	C
Heat Exchanger Components (Residual Heat Removal)	***Pressure Boundary***	***Carbon or Low Alloy Steel with Stainless Steel Cladding (Tubeside Components)***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 8***
Heat Exchanger Components (Residual Heat Removal)	Pressure Boundary	Stainless Steel (Tubes)	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	C
Heat Exchanger Components (Residual Heat Removal)	***Pressure Boundary***	***Stainless Steel (Tubes)***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 8***
Heat Exchanger Components (Sample)	Pressure Boundary	Stainless Steel (Tubes)	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	C
Heat Exchanger Components (Sample)	***Pressure Boundary***	***Stainless Steel (Tubes)***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 8***

Table 3.3.2-5 Component Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger Components (Seal Coolers-Charging/SI Pumps)	Pressure Boundary	Stainless Steel (Tubes)	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	C
Heat Exchanger Components (Seal Coolers-Charging/SI Pumps)	***Pressure Boundary***	***Stainless Steel (Tubes)***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 8***
Heat Exchanger Components (Seal Coolers-RHR Pumps)	Pressure Boundary	Stainless Steel (Tubes)	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	VII.E1-20	3.3.1-90	C
Heat Exchanger Components (Seal Coolers-RHR Pumps)	***Pressure Boundary***	***Stainless Steel (Tubes)***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***VII.E1-20***	***3.3.1-90***	***E, 8***
Heat Exchanger Components (Seal Coolers-RHR Pumps)	Pressure Boundary	Stainless Steel (Tubes)	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	C
Heat Exchanger Components (Seal Coolers-RHR Pumps)	***Pressure Boundary***	***Stainless Steel (Tubes)***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 8***
Heat Exchanger Components (Spent Fuel)	Pressure Boundary	Stainless Steel (Tubes)	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	C
Heat Exchanger Components (Spent Fuel)	***Pressure Boundary***	***Stainless Steel (Tubes)***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 8***

Table 3.3.2-5 Component Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger Components (Spent Fuel)	Pressure Boundary	Stainless Steel (Tubesheet)	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	C
Heat Exchanger Components (Spent Fuel)	***Pressure Boundary***	***Stainless Steel (Tubesheet)***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 8***
Heat Exchanger Components (Spent Fuel)	Pressure Boundary	Stainless Steel (Tubeside Components)	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	C
Heat Exchanger Components (Spent Fuel)	***Pressure Boundary***	***Stainless Steel (Tubeside Components)***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 8***

Plant Specific Notes:

8. The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.

Table 3.3.2-14 Fuel Handling & Fuel Storage System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Bolting	Structural Support	Stainless Steel Bolting	Treated Borated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A2-1	3.3.1-91	C
Bolting	***Structural Support***	***Stainless Steel Bolting***	***Treated Borated Water (External)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A2-1***	***3.3.1-91***	***E, 9***
Crane/hoist (Grapple/Mast for all Fuel Handling Cranes)	Structural Support	Stainless Steel	Treated Borated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A2-1	3.3.1-91	C
Crane/hoist (Grapple/Mast for all Fuel Handling Cranes)	***Structural Support***	***Stainless Steel***	***Treated Borated Water (External)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A2-1***	***3.3.1-91***	***E, 9***
Crane/hoist (New Fuel Elevator)	Structural Support	Stainless Steel	Treated Borated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A2-1	3.3.1-91	C
Crane/hoist (New Fuel Elevator)	***Structural Support***	***Stainless Steel***	***Treated Borated Water (External)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A2-1***	***3.3.1-91***	***E, 9***
Fuel Storage Racks (Spent Fuel)	Structural Support	Stainless Steel	Treated Borated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A2-1	3.3.1-91	C
Fuel Storage Racks (Spent Fuel)	***Structural Support***	***Stainless Steel***	***Treated Borated Water (External)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A2-1***	***3.3.1-91***	***E, 9***
Piping and Fittings	Pressure Boundary	Stainless Steel	Treated Borated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A2-1	3.3.1-91	A
Piping and Fittings	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (External)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A2-1***	***3.3.1-91***	***E, 9***
Piping and Fittings	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A2-1	3.3.1-91	A
Piping and Fittings	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A2-1***	***3.3.1-91***	***E, 9***

Table 3.3.2-14 Fuel Handling & Fuel Storage System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Treated Borated Water (External)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A2-1	3.3.1-91	A
Valve Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (External)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A2-1***	***3.3.1-91***	***E, 9***
Valve Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A2-1	3.3.1-91	A
Valve Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A2-1***	***3.3.1-91***	***E, 9***

Plant Specific Notes:

9. The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.

Table 3.3.2-21 Radwaste System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Flow Element	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	A
Flow Element	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***
Piping and Fittings	Leakage Boundary	Stainless Steel	Treated Borated Water (External) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	VII.E1-20	3.3.1-90	A
Piping and Fittings	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (External) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***VII.E1-20***	***3.3.1-90***	***E, 4***
Piping and Fittings	Leakage Boundary	Stainless Steel	Treated Borated Water (External) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	A
Piping and Fittings	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (External) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***
Piping and Fittings	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	A
Piping and Fittings	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***
Piping and Fittings	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	A
Piping and Fittings	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***
Pump Casing (Reactor Coolant Drain)	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	VII.E1-20	3.3.1-90	A
Pump Casing (Reactor Coolant Drain)	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***VII.E1-20***	***3.3.1-90***	***E, 4***
Pump Casing (Reactor Coolant Drain)	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	A
Pump Casing (Reactor Coolant Drain)	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***

Table 3.3.2-21 Radwaste System (Continued)

Tanks (Reactor Coolant Drain)	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	VII.E1-20	3.3.1-90	A
Tanks (Reactor Coolant Drain)	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***VII.E1-20***	***3.3.1-90***	***E, 4***
Tanks (Reactor Coolant Drain)	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	C
Tanks (Reactor Coolant Drain)	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***
Valve Body	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	A
Valve Body	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***
Valve Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	A
Valve Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***

Plant Specific Notes:

4. The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.

Table 3.3.2-22 Sampling System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping and Fittings	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	VII.E1-17	3.3.1-91	A
Piping and Fittings	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***
Piping and Fittings	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-20	3.3.1-90	A
Piping and Fittings	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-20***	***3.3.1-90***	***E, 4***
Piping and Fittings	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	VII.E1-20	3.3.1-90	A
Piping and Fittings	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***VII.E1-20***	***3.3.1-90***	***E, 4***
Piping and Fittings	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	A
Piping and Fittings	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***
Sink	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	C
Sink	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***
Valve Body	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	VII.E1-20	3.3.1-90	A
Valve Body	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***VII.E1-20***	***3.3.1-90***	***E, 4***
Valve Body	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	A
Valve Body	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***

Table 3.3.2-22 Sampling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Cracking/Stress Corrosion Cracking	Water Chemistry	VII.E1-20	3.3.1-90	A
Valve Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***VII.E1-20***	***3.3.1-90***	***E, 4***
Valve Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal) > 140 F	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.E1-17	3.3.1-91	A
Valve Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal) > 140 F***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.E1-17***	***3.3.1-91***	***E, 4***

Plant Specific Notes:

4. The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.

Table 3.3.2-25 Spent Fuel Cooling System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Filter Housing	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	A
Filter Housing	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***E, 2***
Flow Element	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	A
Flow Element	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***E, 2***
Piping and Fittings	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	A
Piping and Fittings	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***E, 2***
Piping and Fittings	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	A
Piping and Fittings	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***E, 2***
Pump Casing (Purification Pump)	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	A
Pump Casing (Purification Pump)	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***E, 2***
Pump Casing (Skimmer Pump)	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	A
Pump Casing (Skimmer Pump)	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***E, 2***
Pump Casing (Spent Fuel Cooling Pump)	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	A
Pump Casing (Spent Fuel Cooling Pump)	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***E, 2***

Table 3.3.2-25 Spent Fuel Cooling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Strainer Body	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	A
Strainer Body	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***E, 2***
Tanks (Demineralizer)	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	C
Tanks (Demineralizer)	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***E, 2***
Thermowell	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	A
Thermowell	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***E, 2***
Valve Body	Leakage Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	A
Valve Body	***Leakage Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***E, 2***
Valve Body	Pressure Boundary	Stainless Steel	Treated Borated Water (Internal)	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	A
Valve Body	***Pressure Boundary***	***Stainless Steel***	***Treated Borated Water (Internal)***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***E, 2***

Plant Specific Notes:

2. The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.

Table 3.5.2-3 Containment Structure

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Penetration sleeves (cap plates)	Structural Support	Stainless Steel	Treated Borated Water	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A2-1	3.3.1-91	C
Penetration sleeves (cap plates)	***Structural Support***	***Stainless Steel***	***Treated Borated Water***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A2-1***	***3.3.1-91***	***E, 15***
Steel Components: Reactor cavity liner, Fuel Transfer Canal liner	Water retaining boundary	Stainless Steel	Treated Borated Water	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A2-1	3.3.1-91	C
Steel Components: Reactor cavity liner, Fuel Transfer Canal liner	***Water retaining boundary***	***Stainless Steel***	***Treated Borated Water***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A2-1***	***3.3.1-91***	***E, 15***
Transfer Tube: Bellows (excludes containment penetration bellows)	Water retaining boundary	Stainless Steel	Treated Borated Water	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A2-1	3.3.1-91	C
Transfer Tube: Bellows (excludes containment penetration bellows)	***Water retaining boundary***	***Stainless Steel***	***Treated Borated Water***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A2-1***	***3.3.1-91***	***E, 15***

Plant Specific Notes:

15. The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.

Table 3.5.2-5 Fuel Handling Building

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Penetration bellows (2 bellows for Transfer tube; excluding containment penetration bellows)	Water retaining boundary	Stainless Steel	Treated Borated Water	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A2-1	3.3.1-91	C
Penetration bellows (2 bellows for Transfer tube; excluding containment penetration bellows)	***Water retaining boundary***	***Stainless Steel***	***Treated Borated Water***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A2-1***	***3.3.1-91***	***C***
Steel components: Leak chase system	Direct Flow	Stainless Steel	Treated Borated Water	Loss of Material/Pitting and Crevice Corrosion	Water Chemistry	VII.A3-8	3.3.1-91	C
Steel components: Leak chase system	***Direct Flow***	***Stainless Steel***	***Treated Borated Water***	***Loss of Material/Pitting and Crevice Corrosion***	***One-Time Inspection***	***VII.A3-8***	***3.3.1-91***	***C***

Plant Specific Notes:

10. The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.

A.2.1.2 Water Chemistry

The Salem Water Chemistry aging management program is an existing program that provides activities for monitoring and controlling the chemical environments of the Salem primary cycle and secondary cycle systems such that aging effects of system components are minimized. Aging effects include cracking, loss of material, reduction of neutron-absorbing capacity and reduction of heat transfer. The primary cycle scope of this program consists of the reactor coolant system and related auxiliary systems containing treated water, reactor coolant, treated borated water and steam, including the primary side of the steam generators that contain treated water and steam. The secondary cycle portion of the program consists of the various secondary side systems and the secondary side of the steam generators. Major component types include reactor vessel, reactor internals, piping, piping elements and piping components, heat exchangers and tanks. The Water Chemistry aging management program is consistent with EPRI, Pressurized Water Reactor Primary Chemistry Guidelines, and Plant UFSAR limits for fluorides, chlorides, and dissolved oxygen. The Water Chemistry program is consistent with EPRI, Pressurized Water Secondary Water Chemistry Guidelines.

The One-Time Inspection program will be used to verify the effectiveness of the Water Chemistry program in managing the aging effects for stainless steel components in a treated borated water environment, where dissolved oxygen may not be controlled to less than 100 ppb.

A.2.1.20 One-Time Inspection

The One-Time Inspection aging management program is a new program that will provide reasonable assurance that an aging effect is not occurring, or that the aging effect is occurring slowly enough to not affect a component intended function during the period of extended operation, and therefore will not require additional aging management. The program will be credited for cases where either (a) an aging effect is not expected to occur but there is insufficient data to completely rule it out, (b) an aging effect is expected to progress very slowly in the specified environment, but the local environment may be more adverse than that generally expected, or (c) the characteristics of the aging effect include a long incubation period. Major component types covered by the program include, piping, piping elements and piping components, steam generators, heat exchangers and tanks.

The One-Time Inspection aging management program will be used for the following:

1. To confirm the effectiveness of the Water Chemistry program to manage the loss of material, cracking, and the reduction of heat transfer aging effects for aluminum, copper alloy, steel, stainless steel, and cast austenitic stainless steel in treated water, treated borated water ***where dissolved oxygen may not be controlled to less than 100 ppb***, steam, and reactor coolant environments.
2. To confirm the effectiveness of the Fuel Oil Chemistry program to manage the loss of material aging effect for aluminum, copper alloy, gray cast iron, steel and stainless steel in a fuel oil environment.
3. To confirm the effectiveness of the Lubricating Oil Analysis program to manage the loss of material and the reduction of heat transfer aging effects for aluminum, copper alloy,

ductile cast iron, gray cast iron, steel, stainless steel, cast austenitic stainless steel and titanium alloy in a lubricating oil environment.

The sample plan for inspections associated with the One-Time Inspection program will be developed to ensure there are adequate inspections to address each of the material, environment, and aging effect combinations. A sample size of 20% of the population (up to a maximum of 25 inspections) will be established for each of the sample groups. Inspection methods will include visual examination or volumetric examinations. Acceptance criteria are in accordance with industry guidelines, codes, and standards, including the applicable edition of ASME Boiler and Pressure Vessel Code, Section XI. The One-Time Inspection program provides for the evaluation of the need for follow-up examinations to monitor the progression of aging if age-related degradation is found that could jeopardize an intended function before the end of the period of extended operation. Should aging effects be detected, the program triggers actions to characterize the nature and extent of the aging effect and determines what subsequent monitoring is needed to ensure intended functions are maintained during the period of extended operation.

The new program, including performance of physical inspections and evaluation of results, will be implemented prior to the period of extended operation.

A.5 License Renewal Commitment List

NO.	PROGRAM OR TOPIC	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
20	One-Time Inspection	One-Time Inspection is a new program and will be used for the following: 1. To confirm the effectiveness of the Water Chemistry program to manage the loss of material, cracking, and the reduction of heat transfer aging effects for aluminum, copper alloy, nickel alloy, steel, stainless steel, and cast austenitic stainless steel in treated water, treated borated water ***where dissolved oxygen may not be controlled to less than 100 ppb,*** steam, and reactor coolant environments. 2. To confirm the effectiveness of the Fuel Oil Chemistry program to manage the loss of material aging effect for aluminum, copper alloy, gray cast iron, steel and stainless steel in a fuel oil environment. 3. To confirm the effectiveness of the Lubricating Oil Analysis program to manage the loss of material and the reduction of heat transfer aging effects for aluminum, copper alloy, ductile cast iron, gray cast iron, steel, stainless steel, cast austenitic stainless steel and titanium alloy in a lubricating oil	A.2.1.20	Program to be implemented prior to the period of extended operation. One-time inspections to be performed within the ten-year period prior to the period of extended operation.	Section B.2.1.20 Salem Letter LR-N11-0005 RAI B.2.1.20-01 ***Salem Letter LR-N11-0148 DRAI 3.2.1.48***

NO.	PROGRAM OR TOPIC	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
		environment. The sample plan for inspections associated with the One-Time Inspection program will be developed to ensure there are adequate inspections to address each of the material, environment, and aging effect combinations. A sample size of 20% of the population (up to a maximum of 25 inspections) will be established for each of the sample groups.			

B.2.1.2 WATER CHEMISTRY

Program Description

The Salem Water Chemistry aging management program is an existing program that provides activities for monitoring and controlling the chemical environments of the Salem primary cycle and secondary cycle systems such that aging effects of system components are minimized. This program manages the aging effects of cracking, loss of material, reduction of neutron-absorbing capacity and reduction of heat transfer. The program mitigates damage caused by corrosion and stress corrosion cracking (SCC) and other aging mechanisms. This program includes provisions specified by NUREG-1801 for the verification of proper chemistry control and aging management, such that the intended functions of plant components will be maintained during the period of extended operation for Salem.

The primary scope of this program consists of the reactor coolant system and related auxiliary systems containing treated water, reactor coolant, treated borated water and steam, including the primary side of the steam generators. Major component types include reactor vessel, reactor internals, piping, piping elements and piping components, heat exchangers and tanks. The primary water portion of the program is consistent with the EPRI 1014986, PWR Primary Water Chemistry Guidelines, Revision 6 and includes UFSAR limits for fluorides, chlorides, and dissolved oxygen. The secondary cycle scope of the program includes the various secondary side systems and the secondary side of the steam generators that contain treated water or steam. The secondary water portion of this program is consistent with the EPRI 1008224, PWR Secondary Water Chemistry Guidelines, Revision 6.

The Salem Water Chemistry aging management program includes periodic sampling of primary and secondary water for the known detrimental contaminants specified in the EPRI PWR water chemistry guidelines, such as chlorides, fluorides, dissolved oxygen, and sulfates, to maintain their concentrations below levels known to result in loss of material or cracking. Sampling frequencies and action limits for each control parameter are defined in Salem specific procedures.

Salem follows the guidance set forth in EPRI 1014986, PWR Primary Water Chemistry Guidelines, Revision 6 and the EPRI 1008224, PWR Secondary Water Chemistry Guidelines, Revision 6, which are later revisions to the guidelines referenced in NUREG-1801, XI.M2 (EPRI TR-105714 and EPRI 102134). However, NUREG-1801, XI.M2 states that later revisions are acceptable. The primary water portion of the program is consistent with the EPRI 1014986, PWR Primary Water Chemistry Guidelines, Revision 6 and includes Plant UFSAR limits for fluorides, chlorides, and dissolved oxygen. The chemistry control strategy for Salem primary water systems, including the reactor coolant system and related auxiliary systems containing reactor coolant and treated borated water, is defined in the primary strategic water chemistry plan for recirculating steam generator plants. This program includes routine sampling of specific chemical control parameters

including chloride, fluoride, sulfate, sodium, dissolved oxygen, hydrogen, and other parameters. The program functions to maintain these concentrations below recommended levels to mitigate SCC of austenitic stainless steel, Alloy 600, and Alloy 690 components in accordance with the EPRI guidelines. Additionally, limits are specified for chemistry parameters associated with PWR auxiliary systems and components, including the boric acid storage tanks, volume control tank, spent fuel pool, and other primary side auxiliaries. Routine control of reactor coolant and related auxiliary system contaminants is maintained by using submicron filters and mixed bed demineralizers, which provide mechanical filtration and ion exchange functions to remove contaminants. Lithium hydroxide addition is used to control reactor coolant pH, while hydrogen addition is utilized for oxygen scavenging.

Similarly, chemical control of the secondary water systems is consistent with the EPRI 1008224, PWR Secondary Water Chemistry Guidelines, Revision 6. Chemistry control for Salem secondary water systems is defined in the secondary water strategic chemistry plan for recirculating steam generator plants. The secondary cycle scope of the program includes the various secondary side systems and the secondary side of the steam generators. Chemical control of the Salem secondary water systems is established and maintained by removing contaminants with condensate demineralizers combined with steam generator blowdown. This program includes routine sampling of specific chemical control parameters including chloride, sulfate, sodium, hydrazine, dissolved oxygen, silica, total iron, pH, cation conductivity, and other parameters to mitigate steam generator tube degradation cause by denting, intergranular attack (IGA), outside diameter stress corrosion cracking (ODSCC), or crevice and pitting corrosion. Monitoring and control of these parameters is also intended to mitigate general, crevice, and pitting corrosion of the steam generator shell and secondary side plant components. Routine control of secondary water system contaminants is maintained by using condensate mixed bed demineralizers and steam generator blowdown. Volatile chemical addition, including use of an approved amine, is utilized for pH control. Hydrazine is used to scavenge oxygen in secondary water systems.

Routine primary and secondary system sampling frequencies and action limits for each control parameter are specified in station procedures in accordance with EPRI water chemistry guidelines. Critical parameters are monitored continuously while non-critical parameters have defined monitoring frequencies. For primary water systems, parameter-specific corrective actions include consideration of increased sampling frequencies until the parameters are returned to specifications. Increased sampling is considered and performed as required for primary and secondary system parameters with action level values. Increased sampling frequency is required when monitoring instruments are out of service in the feedwater and condensate systems.

Industry experience has shown that water chemistry programs may not be effective in low flow or stagnant flow areas of plant systems. The Water Chemistry aging management program does not provide for detection of aging effects. However, components located in selected areas at Salem***, including in treated borated water systems where dissolved oxygen may not be controlled to less than 100 ppb,*** will receive a one-time visual inspection prior to the period of extended

operation. This inspection will be performed as part of the Salem One-Time Inspection aging management program. This program includes provisions specified by NUREG-1801 for the verification of proper chemistry control and aging management; such that the intended functions of plant components will be maintained during the period of extend operation for Salem.

Site quality assurance procedures, review and approval processes, and administrative controls are implemented in accordance with the requirements of 10 CFR Part 50, Appendix B.

NUREG-1801 Consistency

The Water Chemistry Program is consistent with the ten elements of aging management program XI.M2, "Water Chemistry Program", specified in NUREG-1801.

B.2.1.20 ONE-TIME INSPECTION

Program Description

The One-Time Inspection aging management program is a new program that will provide reasonable assurance that an aging effect is not occurring, or that the aging effect is occurring slowly enough to not affect a components intended function during the period of extended operation, and therefore will not require additional aging management. The program will be credited for cases where either (a) an aging effect is not expected to occur but there is insufficient data to completely rule it out, (b) an aging effect is expected to progress very slowly in the specified environment, but the local environment may be more adverse than that generally expected, or (c) the characteristics of the aging effect include a long incubation period. Major component types covered by the program include piping, piping elements and piping components, steam generators, heat exchangers and tanks.

The One-Time Inspection aging management program will be used for the following:

1. To confirm the effectiveness of the Water Chemistry program to manage the loss of material, cracking, and the reduction of heat transfer aging effects for aluminum, copper alloy, steel, stainless steel, and cast austenitic stainless steel in treated water, treated borated water ***where dissolved oxygen may not be controlled to less than 100 ppb***, steam, and reactor coolant environments.

2. To confirm the effectiveness of the Fuel Oil Chemistry program to manage the loss of material aging effect for aluminum, copper alloy, gray cast iron, steel and stainless steel in a fuel oil environment.

3. To confirm the effectiveness of the Lubricating Oil Analysis program to manage the loss of material and the reduction of heat transfer aging effects for aluminum, copper alloy, ductile cast iron, gray cast iron, steel, stainless steel, cast austenitic stainless steel and titanium alloy in a lubricating oil environment.

ENCLOSURE 2

May 26, 2011

LICENSEE: PSEG Nuclear, LLC

FACILITY: Salem Nuclear Generating Station, Units 1 and 2

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON MAY 10, 2011, BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION AND PSEG NUCLEAR, LLC, CONCERNING A DRAFT RESPONSE TO A DRAFT REQUEST FOR ADDITIONAL INFORMATION PERTAINING TO THE SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2, (SALEM) LICENSE RENEWAL APPLICATION

The U.S. Nuclear Regulatory Commission (NRC or the staff) and representatives of PSEG Nuclear, LLC (the applicant), and Exelon held a telephone conference call on May 10, 2011, to discuss the applicant's draft response to the staff's request for additional information (D-RAI) 3.2.1.48. The telephone conference call was useful in clarifying the intent of the applicant's D-RAI response.

Enclosure 1 provides a listing of the participants. Enclosure 2 contains a brief summary of the discussion and status of the items. Enclosure 3 includes the applicant's response to the D-RAI.

The applicant had an opportunity to comment on this summary.

/RA/

Samuel Cuadrado de Jesús, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

Enclosures:
As stated

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OFFICE	LA:DLR*	PM: DLR/RPB1	BC: DLR/RPB1	PM: DLR/RPB1
NAME	SFigueroa	SCuadrado	BPham	SCuadrado
DATE	05/26/2011	05/25/2011	05/25/2011	05/26/2011

OFFICIAL RECORD COPY

Letter to PSEG Nuclear from Samuel Cuadrado-De Jesus dated May 26, 2011

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON MAY 10, 2011, BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION AND PSEG NUCLEAR, LLC, CONCERNING A DRAFT RESPONSE TO A DRAFT REQUEST FOR ADDITIONAL INFORMATION PERTAINING TO THE SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2, (SALEM) LICENSE RENEWAL APPLICATION

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