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10 CFR 50
10 CFR 51
10 CFR 54

January 23, 2019

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

Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277 and 50-278

Subject: Supplement No. 2 - Changes to the Peach Bottom Atomic Power Station, Units 2 and 3, Subsequent License Renewal Application

References:
1. Letter from Michael P. Gallagher, Exelon Generation Company, LLC (Exelon) to NRC Document Control Desk, dated July 10, 2018, "Application for Subsequent Renewed Operating Licenses"

2. Letter from Michael P. Gallagher, Exelon Generation Company, LLC (Exelon) to NRC Document Control Desk, dated September 14, 2018, "Changes to the Peach Bottom Atomic Power Station, Units 2 and 3, Subsequent License Renewal Application" (Supplement No. 1)

In Reference 1, Exelon submitted the Subsequent License Renewal Application (SLRA) for the Peach Bottom Atomic Power Station, Units 2 and 3 (PBAPS). In Reference 2, Exelon submitted Supplement No. 1 to the SLRA for PBAPS. The purpose of this letter is to provide Supplement No. 2 to the SLRA for PBAPS. Supplement No. 2 includes twenty changes to the SLRA which provide additional information and clarifications in the SLRA to address the NRC Safety Review Audit information needs.

Enclosure A to this letter provides a description of each change, and corresponding mark-ups to affected portions of the SLRA, thereby supplementing the PBAPS SLRA.

Enclosure B to this letter provides an update to the License Renewal Commitment List (LRA Appendix A, Section A.5). There are no other new or revised regulatory commitments contained in this letter.

This submittal has been discussed with the NRC License Renewal Senior Project Manager for the PBAPS Subsequent License Renewal project.

If you have any questions, please contact Mr. David Distel, Licensing Lead, Exelon License Renewal Projects, at 610-765-5517.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 23rd day of January 2019.

Respectfully submitted,

Michael P. Gallagher
Vice President - License Renewal and Decommissioning
Exelon Generation Company, LLC

Enclosures: A. Changes to the PBAPS Subsequent License Renewal Application
B. PBAPS Subsequent License Renewal Commitment List Update

cc: Regional Administrator – NRC Region I
NRC Senior Project Manager (Safety Review), NRR-DMLR
NRC Project Manager (Environmental Review), NRR-DMLR
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Enclosure A

Changes to the PBAPS Subsequent License Renewal Application

Introduction

This enclosure contains twenty changes that are being made to the Subsequent License Renewal Application (SLRA) that were identified after submittal of the SLRA. For each item, the change is described and the affected page number(s) and portion(s) of the SLRA is provided. For clarity, entire sentences or paragraphs from the SLRA are provided with deleted text highlighted by ~~strikethroughs~~ and inserted text highlighted by ***bolded italics***. Revisions to SLRA tables are shown by providing excerpts from the affected tables.

Change #1 – Addition of Reference to Tanks PBD in Appendix A, Internal Coatings

Affected SLRA Sections: Appendix A, Section A.2.1.29

SLRA Page Numbers: A-39

Description of Change:

GALL-SLR Report AMP XI.M42 states an applicant may elect to manage the aging effects for internal coatings/linings for in-scope piping, piping components, heat exchangers, and tanks in an alternative AMP that is specific to the component or system in which the coatings/linings are installed if the FSAR supplement for this AMP as shown in the GALL-SLR Report Table XI-01, "FSAR Supplement Summaries for GALL-SLR Report Chapter XI Aging Management Programs," is included in the application with a reference to the alternative AMP.

While SLRA Section B.2.1.29 does include reference to the Outdoor and Large Atmospheric Metallic Storage Tanks program, SLRA Section A.2.1.29, "Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks," does not reference the Outdoor and Large Atmospheric Metallic Storage Tanks program.

Accordingly, SLRA Appendix A, Section A.2.1.29 is revised to add reference to the Outdoor and Large Atmospheric Metallic Storage Tanks program.

SLRA Section A.2.1.29, Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks, page A-39, second paragraph, is revised as shown below:

A.2.1.29 Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks

This program manages these aging effects for internal coatings by conducting periodic visual inspections of all coatings/linings applied to the internal surfaces of in scope components where loss of coating or lining integrity could impact the component's or downstream component's current licensing basis intended function(s). ***The internal surfaces of the Condensate Storage Tanks and Refueling Water Storage Tank are coated; aging management for these tanks is covered under the Outdoor and Large Atmospheric Metallic Storage Tanks (A.2.1.18) program and includes the applicable requirements for coating inspections from the Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program.*** Aging management of galvanized piping in the Plant Equipment and Floor Drain System, and internally coated tanks in the Radwaste and Reactor Water Cleanup Systems will be performed under the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (A.2.1.25) program.

Change #2 – Applicability of Cracking Aging Effect to Titanium Main Condenser Tubes

Affected SLRA Sections: Table 3.4.1, Table 3.4.2-4, Appendix A, Section A.2.1.25, and Appendix B, Section B.2.1.25

SLRA Page Numbers: 3.4-53, 3.4-80, 3.4-84, A-35, and B-144

Description of Change:

The applicability of cracking in titanium components requires updating in the SLRA. SLRA Table 3.4.2-4 currently indicates that cracking is an applicable aging effect for titanium components exposed to raw water in the Main Condenser system, but that it is not an applicable aging effect for titanium components exposed to treated water in the same system. This discrepancy is being corrected to reflect that cracking is an applicable aging effect in both environments. In addition, Sections A.2.1.25 and B.2.1.25 do not discuss cracking of titanium in raw water, and are being updated for completeness.

Accordingly, SLRA Table 3.4.1, Table 3.4.2-4, Appendix A, Section A.2.1.25, and Appendix B, Section B.2.1.25 are revised.

SLRA Table 3.4.1, Summary of Aging Management Evaluations for the Steam and Power Conversion Systems, page 3.4-53, is revised as shown below:

Table 3.4.1 Summary of Aging Management Evaluations for the Steam and Power Conversion Systems					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.4.1-114	Titanium heat exchanger tubes exposed to treated water	Cracking due to SCC, reduction of heat transfer due to fouling	AMP XI.M2, "Water Chemistry," and AMP XI.M32, "One-Time Inspection"	No	***Consistent with NUREG-2191 with exceptions. The One-Time Inspection (B.2.1.21) program and Water Chemistry (B.2.1.2) program will be used to manage cracking of the titanium heat exchanger tubes exposed to treated water in the Main Condenser System.*** ***Exceptions apply to the NUREG-2191 recommendations for Water Chemistry (B.2.1.2) program implementation.*** Titanium heat exchanger tubes exposed to treated water in the Main Condenser System only have an intended function of holdup, therefore the aging effects of ~~cracking due to SCC and~~ reduction of heat transfer due to fouling ***is*** ~~are~~ not managed.

SLRA Table 3.4.2-4, Main Condenser System, Summary of Aging Management Evaluation, pages 3.4-80 and 3.4-84, are revised as shown below. This SLRA markup also includes the changes discussed in Change #11 below to include a plant specific note for grade 2 titanium, and is duplicated here as an aid to the reviewer.

Table 3.4.2-4
Main Condenser System
Summary of Aging Management Evaluation

Table 3.4.2-4 Main Condenser System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Heat Exchanger - (Main Condenser) Tube Sheet	Holdup	Titanium	Raw Water (Internal)	Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VIII.E.S-478b	3.4.1-130	A
			Treated Water (External)	None	None	VIII.I.S-463	3.4.1-115	A, ***3***
Heat Exchanger - (Main Condenser) Tubes	Holdup	Titanium	Raw Water (Internal)	Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.C1.A-736	3.3.1-207	A
			Treated Water (External)	***Cracking***	***One-Time Inspection (B.2.1.21)***	***VIII.E.S-462***	***3.4-1-114***	***A***
					Water Chemistry (B.2.1.2)	***VIII.E.S-462***	***3.4-1-114***	***B***
				None	None	VIII.E.S-462	3.4.1-114	I, 1

Table 3.4.2-4 Main Condenser System (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

1. The component performs an intended function of holdup only and therefore, the aging effect~~s~~ of ~~cracking and~~ reduction of heat transfer due to fouling ~~are~~ ***is*** not applicable.
2. The rupture disks are constructed of 3003 aluminum alloy which is not susceptible to stress corrosion cracking.
3. ***Components are constructed of grade 2 titanium.***

SLRA Appendix A, Section A.2.1.25, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, page A-35, first paragraph, is revised as shown below to address managing of cracking for titanium components. This SLRA markup also includes the changes discussed in Change #3 below to address flow blockage, and is duplicated here as an aid to the reviewer.

A.2.1.25 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components

The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is a new condition monitoring program that will manage loss of material and cracking of metallic components, as well as loss of material and hardening and loss of strength of elastomeric materials. Reduction of heat transfer ***and flow blockage*** will also be managed. This program will consist of visual inspections of all accessible internal surfaces of piping, piping components, ducting, heat exchanger components, and other mechanical components. Applicable environments include condensation, closed cycle cooling water, diesel exhaust, fuel oil, lube oil, raw water, treated water, and waste water. Visual (VT-1) or surface examinations will be performed to detect cracking of stainless steel components exposed to a diesel exhaust environment. ***Visual (VT-1), surface, or volumetric examinations will be performed to detect cracking of titanium components exposed to raw water.*** Except for hardening and loss of strength of elastomers, aging effects associated with components within the scope of the Open Cycle Cooling Water System (A.2.1.11) program, Closed Treated Water Systems (A.2.1.12) program, and Fire Water System (A.2.1.17) program will not be managed by this program. Loss of material due to recurring internal corrosion on the drain pans of the HPCI, RCIC, Core Spray and RHR pump room unit coolers will be managed by this program. Additionally, in accordance with NUREG-2191, AMP XI.M42, "Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks", loss of coating integrity for certain internally coated tanks in the Radwaste and Reactor Water Cleanup Systems will be performed by this program.

SLRA Appendix B, Section B.2.1.25, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, page B-144, first paragraph, is revised as shown below to address managing of cracking for titanium components. This SLRA markup also includes the changes discussed in Change #3 below to address flow blockage, and is duplicated here as an aid to the reviewer.

B.2.1.25 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components

Program Description

The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is a new condition monitoring program that will manage loss of material and cracking of metallic components, as well as loss of material and hardening and loss of strength of elastomeric materials. Reduction of heat transfer **and flow blockage** will also be managed. This program will consist of visual inspections of internal surfaces of piping, piping components, ducting, heat exchanger components, polymeric and elastomeric components, and other mechanical components. Applicable environments include condensation, closed cycle cooling water, diesel exhaust, fuel oil, lube oil, raw water, treated water, and waste water. Visual (VT-1) or surface examinations will be performed to detect cracking of stainless steel components exposed to diesel exhaust. ***Visual (VT-1), surface, or volumetric examinations will be performed to detect cracking of titanium components exposed to raw water.*** Except for hardening and loss of strength of elastomers, aging effects associated with components within the scope of the Open-Cycle Cooling Water System (B.2.1.11) program, Closed Treated Water Systems (B.2.1.12) program, and Fire Water System (B.2.1.17) program will not be managed by this program. Loss of material due to recurring internal corrosion on the drain pans of the HPCI, RCIC, Core Spray and RHR pump room unit coolers will be managed by this program.

Change #3 – Addition of Flow Blockage as an Applicable Aging Effect

Affected SLRA Sections: Section 3.2.2.1.4, Table 3.2.2-2, Table 3.2.2-4, Table 3.2.2-6, Section 3.3.2.1.19, Section 3.3.2.1.34, Table 3.3.1, Table 3.3.2-12, Table 3.3.2-19, Table 3.3.2-34, Appendix A, Section A.2.1.25, and Appendix B, Section B.2.1.25

SLRA Page Numbers: 3.2-7, 3.2-84, 3.2-117, 3.2-121, 3.2-143, 3.3-26, 3.3-42, 3.3-98, 3.3-101, 3.3-103, 3.3-117, 3.3-157, 3.3-230, 3.3-300 thru 302, 3.3-309, 3.3-310, 3.3-393, 3.3-394, A-35, and B-144

Description of Change:

Flow blockage due to fouling is an applicable aging effect for components in a raw water or waste water environment that perform a pressure boundary or filter intended function. Some instances have been identified where flow blockage was not identified for these conditions, and the applicable SLRA pages are being updated to include this aging effect. In addition, it was identified that the waste water environment is not applicable to valve bodies that perform a pressure boundary function in the Emergency Diesel Generator system, and the SLRA is being updated to delete this environment.

Accordingly, SLRA Section 3.2.2.1.4, Table 3.2.2-2, Table 3.2.2-4, Table 3.2.2-6, Section 3.3.2.1.19, Section 3.3.2.1.34, Table 3.3.1, Table 3.3.2-12, Table 3.3.2-19, Table 3.3.2-34, Appendix A, Section A.2.1.25, and Appendix B, Section B.2.1.25 are revised.

SLRA Section 3.2.2.1.4, Primary Containment Isolation System, Aging Effects Requiring Management, page 3.2-7, is revised as shown below:

3.2.2.1.4 Primary Containment Isolation System

Aging Effects Requiring Management

The following aging effects associated with the Primary Containment Isolation System components require management:

- Cracking
- Cumulative Fatigue Damage
- ***Flow Blockage***
- Long-Term Loss of Material
- Loss of Fracture Toughness
- Loss of Material
- Loss of Preload

SLRA Table 3.2.2-2, Core Spray System, Summary of Aging Management Evaluation, page 3.2-84, is revised as shown below:

Table 3.2.2-2 Core Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Heat Exchanger - (Core Spray Pump Room Cooler) Shell Side Components	Pressure Boundary	Galvanized Steel	Air - Indoor Uncontrolled (External)	None	None	VII.J.AP-13	3.3.1-116	C
			Condensation (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	V.D2.E-27	3.2.1-046	C
			Waste Water (Internal)	***Flow Blockage***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)***	***VII.E5.AP-281***	***3.3.1-091***	***A***
				Long-Term Loss of Material	One-Time Inspection (B.2.1.21)	VII.E5.A-785	3.3.1-193	A
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E5.AP-281	3.3.1-091	A
						V.D2.E-400	3.2.1-066	C

SLRA Table 3.2.2-4, Primary Containment Isolation System, Summary of Aging Management Evaluation, pages 3.2-117 and 3.2-121, are revised as shown below:

Table 3.2.2-4 Primary Containment Isolation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Piping, piping components	Pressure Boundary	Carbon Steel	Waste Water (Internal)	***Flow Blockage***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)***	***VII.E5.AP-281***	***3.3.1-091***	***A***
				Long-Term Loss of Material	One-Time Inspection (B.2.1.21)	VII.E5.A-785	3.3.1-193	A
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E5.AP-281	3.3.1-091	A

Table 3.2.2-4 Primary Containment Isolation System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon Steel	Waste Water (Internal)	***Flow Blockage***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)***	***VII.E5.AP-281***	***3.3.1-091***	***A***
				Long-Term Loss of Material	One-Time Inspection (B.2.1.21)	VII.E5.A-785	3.3.1-193	A
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E5.AP-281	3.3.1-091	A

SLRA Table 3.2.2-6, Residual Heat Removal System, Summary of Aging Management Evaluation, page 3.2-143, is revised as shown below:

Table 3.2.2-6 Residual Heat Removal System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Heat Exchanger - (RHR Pump Room Cooler) Shell Side Components	Pressure Boundary	Galvanized Steel	Waste Water (Internal)	***Flow Blockage***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)***	***VII.E5.AP-281***	***3.3.1-091***	***A***
				Long-Term Loss of Material	One-Time Inspection (B.2.1.21)	VII.E5.A-785	3.3.1-193	A
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E5.AP-281	3.3.1-091	A
						V.D2.E-400	3.2.1-066	C

SLRA Section 3.3.2.1.19, Plant Equipment and Floor Drain System, Aging Effects Requiring Management, page 3.3-26, is revised as shown below:

3.3.2.1.19 Plant Equipment and Floor Drain System

Aging Effects Requiring Management

The following aging effects associated with the Plant Equipment and Floor Drain System components require management:

- Cracking
- ***Flow Blockage***
- Hardening and Loss of Strength
- Long-Term Loss of Material
- Loss of Coating or Lining Integrity
- Loss of Material
- Loss of Preload

SLRA Section 3.3.2.1.34, Traveling Water Screen System, Aging Effects Requiring Management, page 3.3-42, is revised as shown below:

3.3.2.1.34 Traveling Water Screen System

Aging Effects Requiring Management

The following aging effects associated with the Traveling Water Screen System components require management:

- Cracking
- ***Flow Blockage***
- Hardening and Loss of Strength
- Long-Term Loss of Material
- Loss of Material
- Loss of Preload
- Wall Thinning

SLRA Table 3.3.1, Summary of Aging Management Evaluations for the Auxiliary Systems, pages 3.3-98, 3.3-101, 3.3-103, 3.3-117, and 3.3-157, are revised as shown below:

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
3.3.1-085	Elastomer piping, piping components, seals exposed to air, condensation, closed-cycle cooling water, treated borated water, treated water, raw water, raw water (potable), waste water, gas, fuel oil, lubricating oil	Hardening or loss of strength due to elastomer degradation; flow blockage due to fouling (raw water, waste water only)	AMP XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components"	No	Consistent with NUREG-2191. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25) program will be used to manage ***flow blockage and*** hardening and loss of strength of the elastomer ducting, ducting components, piping, piping components exposed to closed cycle cooling water, condensation, fuel oil, lubricating oil, raw water, treated water, and waste water in the Battery and Emergency Switchgear Ventilation System, Control Room Ventilation System, Diesel Generator Building Ventilation System, Emergency Diesel Generator System, Emergency Service Water System, Plant Equipment and Floor Drain System, Pump Structure Ventilation System, Torus Water Storage and Transfer System, Traveling Water Screen System, Core Spray System, and Residual Heat Removal System.

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
3.3.1-091	Steel piping, piping components, heat exchanger components, tanks exposed to waste water	Loss of material due to general, pitting, crevice corrosion, MIC; flow blockage due to fouling	AMP XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components"	No	Consistent with NUREG-2191. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25) program will be used to manage loss of material ***and flow blockage*** of the carbon steel, ductile iron, galvanized steel, and gray cast iron heat exchanger components, piping, piping components, and tanks exposed to waste water in the Chilled Water System, Emergency Diesel Generator System, Plant Equipment and Floor Drain System, Process Sampling System, Radwaste System, Standby Liquid Control System, Core Spray System, High Pressure Coolant Injection System, Primary Containment Isolation System, Reactor Core Isolation Cooling System, and Residual Heat Removal System. The External Surfaces Monitoring of Mechanical Components (B.2.1.24) program has been substituted and will be used to manage loss of material of the carbon steel piping, piping components exposed to waste water in the High Pressure Coolant Injection System and Standby Liquid Control System.

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**
3.3.1-095	Copper alloy, stainless steel, nickel alloy piping, piping components, heat exchanger components, tanks exposed to waste water	Loss of material due to general (copper alloy only), pitting, crevice corrosion, MIC; flow blockage due to fouling	AMP XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components"	No	Consistent with NUREG-2191. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25) program will be used to manage loss of material of the copper alloy and stainless steel piping, piping components, and tanks exposed to waste water in the ~~Emergency Diesel Generator System,~~ Plant Equipment and Floor Drain System, Process Sampling System, Radwaste System, and Containment Atmosphere Control and Dilution System.

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**
3.3.1-134	Steel, stainless steel, copper alloy piping, piping components, and heat exchanger components exposed to raw water (for components not covered by NRC GL 89-13)	Loss of material due to general (steel, copper alloy only), pitting, crevice corrosion, MIC; flow blockage due to fouling	AMP XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components"	No	Consistent with NUREG-2191. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25) program will be used to manage loss of material ***and flow blockage*** of the carbon steel, copper alloy, and stainless steel piping, piping components, and traveling screens exposed to raw water in the Traveling Water Screen System.

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
3.3.1-258	Metallic, elastomer, fiberglass, HDPE piping, piping components exposed to waste water	Flow blockage due to fouling	AMP XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components"	No	Not Applicable. ~~There are no metallic, elastomer, fiberglass, HDPE piping, piping components exposed to waste water with a flow rate or heat transfer function in Auxiliary Systems.~~ ***Metallic and elastomer piping, piping components exposed to waste water which are susceptible to flow blockage due to fouling are addressed by line items 3.3.1-085 and 3.3.1-091.***

SLRA Table 3.3.2-12, Emergency Diesel Generator System, Summary of Aging Management Evaluation, page 3.3-230, is revised as shown below:

Table 3.3.2-12 Emergency Diesel Generator System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Valve Body	Pressure Boundary	Copper Alloy with 15% Zinc or Less	Fuel Oil (Internal)	Loss of Material	One-Time Inspection (B.2.1.21)	VII.H1.AP-132	3.3.1-069	A
			Lubricating Oil (Internal)	Loss of Material	Lubricating Oil Analysis (B.2.1.26)	VII.H2.AP-133	3.3.1-099	A
					One-Time Inspection (B.2.1.21)	VII.H2.AP-133	3.3.1-099	A
			~~Waste Water (Internal)~~	~~Loss of Material~~	~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)~~	~~VII.E5.AP-272~~	~~3.3.1-095~~	~~A~~

SLRA Table 3.3.2-19, Plant Equipment and Floor Drain System, Summary of Aging Management Evaluation, pages 3.3-300, 3.3-301, 3.3-302, 3.3-309, and 3.3-310, are revised as shown below:

Table 3.3.2-19 Plant Equipment and Floor Drain System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Piping, piping components	Pressure Boundary	Carbon Steel	Waste Water (Internal)	***Flow Blockage***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)***	***VII.E5.AP-281***	***3.3.1-091***	***A***
				Long-Term Loss of Material	One-Time Inspection (B.2.1.21)	VII.E5.A-785	3.3.1-193	A
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E5.AP-281	3.3.1-091	A
		Elastomer	Air - Indoor Uncontrolled (External)	Hardening and Loss of Strength	External Surfaces Monitoring of Mechanical Components (B.2.1.24)	VII.I.AP-102	3.3.1-076	A
			Waste Water (Internal)	***Flow Blockage***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)***	***VII.E5.A-728***	***3.3.1-085***	***A***
				Hardening and Loss of Strength	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E5.A-728	3.3.1-085	A

Table 3.3.2-19 Plant Equipment and Floor Drain System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Piping, piping components	Pressure Boundary	Gray Cast Iron	Waste Water (Internal)	***Flow Blockage***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)***	***VII.E5.AP-281***	***3.3.1-091***	***A***
				Long-Term Loss of Material	One-Time Inspection (B.2.1.21)	VII.E5.A-785	3.3.1-193	A
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E5.AP-281	3.3.1-091	A
					Selective Leaching (B.2.1.22)	VII.E5.A-547	3.3.1-072	A

Table 3.3.2-19 Plant Equipment and Floor Drain System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Pump Casing (Circulating Water Pump Structure Sump Pump)	Pressure Boundary	Gray Cast Iron	Waste Water (Internal)	***Flow Blockage***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)***	***VII.E5.AP-281***	***3.3.1-091***	***A***
				Long-Term Loss of Material	One-Time Inspection (B.2.1.21)	VII.E5.A-785	3.3.1-193	A
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E5.AP-281	3.3.1-091	A
					Selective Leaching (B.2.1.22)	VII.E5.A-547	3.3.1-072	A

Table 3.3.2-19 Plant Equipment and Floor Drain System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Valve Body	Pressure Boundary	Carbon Steel	Waste Water (Internal)	***Flow Blockage***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)***	***VII.E5.AP-281***	***3.3.1-091***	***A***
				Long-Term Loss of Material	One-Time Inspection (B.2.1.21)	VII.E5.A-785	3.3.1-193	A
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E5.AP-281	3.3.1-091	A
		Gray Cast Iron	Air - Indoor Uncontrolled (External)	Loss of Material	External Surfaces Monitoring of Mechanical Components (B.2.1.24)	VII.I.A-77	3.3.1-078	A
			Waste Water (Internal)	***Flow Blockage***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)***	***VII.E5.AP-281***	***3.3.1-091***	***A***
				Long-Term Loss of Material	One-Time Inspection (B.2.1.21)	VII.E5.A-785	3.3.1-193	A
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E5.AP-281	3.3.1-091	A
					Selective Leaching (B.2.1.22)	VII.E5.A-547	3.3.1-072	A

SLRA Table 3.3.2-34, Traveling Water Screen System, Summary of Aging Management Evaluation, beginning on page 3.3-393, is revised as shown below:

Table 3.3.2-34 Traveling Water Screen System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Traveling Screen	Filter	Carbon Steel	Raw Water (External)	***Flow Blockage***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)***	***VII.C1.A-727***	***3.3.1-134***	***A***
				Long-Term Loss of Material	One-Time Inspection (B.2.1.21)	VII.C1.A-532	3.3.1-193	A
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.C1.A-727	3.3.1-134	A
		Stainless Steel	Raw Water (External)	***Flow Blockage***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)***	***VII.C1.A-727***	***3.3.1-134***	***A***
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.C1.A-727	3.3.1-134	A

SLRA Appendix A, Section A.2.1.25, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, page A-35, first paragraph, is revised as shown below to address flow blockage. This SLRA markup also includes the changes discussed in Change #2 above to address managing of cracking for titanium components, and is duplicated here as an aid to the reviewer.

A.2.1.25 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components

The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is a new condition monitoring program that will manage loss of material and cracking of metallic components, as well as loss of material and hardening and loss of strength of elastomeric materials. Reduction of heat transfer ***and flow blockage*** will also be managed. This program will consist of visual inspections of all accessible internal surfaces of piping, piping components, ducting, heat exchanger components, and other mechanical components. Applicable environments include condensation, closed cycle cooling water, diesel exhaust, fuel oil, lube oil, raw water, treated water, and waste water. Visual (VT-1) or surface examinations will be performed to detect cracking of stainless steel components exposed to a diesel exhaust environment. ***Visual (VT-1), surface, or volumetric examinations will be performed to detect cracking of titanium components exposed to raw water.*** Except for hardening and loss of strength of elastomers, aging effects associated with components within the scope of the Open Cycle Cooling Water System (A.2.1.11) program, Closed Treated Water Systems (A.2.1.12) program, and Fire Water System (A.2.1.17) program will not be managed by this program. Loss of material due to recurring internal corrosion on the drain pans of the HPCI, RCIC, Core Spray and RHR pump room unit coolers will be managed by this program. Additionally, in accordance with NUREG-2191, AMP XI.M42, "Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks", loss of coating integrity for certain internally coated tanks in the Radwaste and Reactor Water Cleanup Systems will be performed by this program.

SLRA Appendix B, Section B.2.1.25, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, page B-144, first paragraph, is revised as shown below to address flow blockage. This SLRA markup also includes the changes discussed in Change #2 above to address managing of cracking for titanium components, and is duplicated here as an aid to the reviewer.

B.2.1.25 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components

Program Description

The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is a new condition monitoring program that will manage loss of material and cracking of metallic components, as well as loss of material and hardening and loss of strength of elastomeric materials. Reduction of heat transfer ***and flow blockage*** will also be managed. This program will consist of visual inspections of internal surfaces of piping, piping components, ducting, heat exchanger components, polymeric and elastomeric components, and other mechanical components. Applicable environments include condensation, closed cycle cooling water, diesel exhaust, fuel oil, lube oil, raw water, treated water, and waste water. Visual (VT-1) or surface examinations will be performed to detect cracking of stainless steel components exposed to diesel exhaust. ***Visual (VT-1), surface, or volumetric examinations will be performed to detect cracking of titanium components exposed to raw water.*** Except for hardening and loss of strength of elastomers, aging effects associated with components within the scope of the Open-Cycle Cooling Water System (B.2.1.11) program, Closed Treated Water Systems (B.2.1.12) program, and Fire Water System (B.2.1.17) program will not be managed by this program. Loss of material due to recurring internal corrosion on the drain pans of the HPCI, RCIC, Core Spray and RHR pump room unit coolers will be managed by this program.

Change #4 – Clarification of Treated Water Environment Definition

Affected SLRA Sections: Table 3.0-1, Table 3.3.2-24, Table 3.3.2-26

SLRA Page Numbers: 3.0-10, 3.3-333, 3.3-334, 3.3-337, 3.3-354

Description of Change:

The definition for Treated Water in SLRA Table 3.0-1 states that treatments such as corrosion inhibitors and biocides may be used to treat this water. However, treatments such as these are not used for treated water, as treated water is demineralized water which is managed by industry standards such as BWRVIP-190 to maintain purity. Additionally, there is no source for MIC contamination of treated water systems, and a review of Peach Bottom operating experience since 2008 has not revealed evidence of MIC in treated water systems. This is relevant information for tanks identified in SLRA Tables 3.3.2-24 and 3.3.2-26 that are internally coated and being managed under the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components aging management program, instead of the Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks aging management program. This program substitution is only allowed in the absence of MIC. A plant specific note is needed to address the absence of MIC in the internal environment of these tanks.

Accordingly, SLRA Table 3.0-1, Table 3.3.2-24 and Table 3.3.2-26 are revised.

SLRA Table 3.0-1, Peach Bottom Service Environments, page 3.0-10, is revised as shown below:

Table 3.0-1 Peach Bottom Service Environments		
Peach Bottom AMR Environment	**Description**	**Corresponding NUREG-2191 Environments**
Treated Water	Treated water is demineralized water or chemically purified water and is the base water for all clean systems. Depending on the system, treated water may require further processing. ***Treated water environments are managed by industry standards such as BWRVIP-190 which do not consider MIC, as there are no sources of MIC in treated water.*** ~~Treated water may be deaerated and include corrosion inhibitors, biocides, or some combination of these treatments.~~ The treated water environment also includes wet steam. Dry steam, such as main steam up to the high pressure turbine, is addressed as its own environment.	Treated water Air – indoor, uncontrolled [1] Reactor coolant [1] Steam

SLRA Table 3.3.2-24, Radwaste System, Summary of Aging Management Evaluation, pages 3.3-333, 3.3-334, and 3.3-337, are revised as shown below:

Table 3.3.2-24 Radwaste System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Tanks (Filter Aid Tank)	Leakage Boundary	Carbon Steel (with Internal Coating)	Air - Indoor Uncontrolled (External)	Loss of Material	External Surfaces Monitoring of Mechanical Components (B.2.1.24)	VII.I.A-77	3.3.1-078	A
			Treated Water (Internal)	Loss of Coating or Lining Integrity	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E4.A-416	3.3.1-138	E, ~~1~~ *2*

Table 3.3.2-24 Radwaste System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Tanks (Filter Aid Tank)	Leakage Boundary	Carbon Steel (with Internal Coating)	Treated Water (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E4.A-414	3.3.1-139	E, ~~1~~ 2
Tanks (Laundry Hot Water Heater)	Leakage Boundary	Carbon Steel	Air - Indoor Uncontrolled (External)	Loss of Material	External Surfaces Monitoring of Mechanical Components (B.2.1.24)	VII.I.A-77	3.3.1-078	A
			Raw Water (Internal)	Long-Term Loss of Material	One-Time Inspection (B.2.1.21)	VII.E3.A-439	3.3.1-193	A
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E5.AP-270	3.3.1-088	C
Tanks (Mixing Tank)	Leakage Boundary	Stainless Steel	Air - Indoor Uncontrolled (External)	Cracking	One-Time Inspection (B.2.1.21)	VII.E4.AP-209a	3.3.1-004	A
				Loss of Material	One-Time Inspection (B.2.1.21)	VII.E4.AP-221a	3.3.1-006	A
			Waste Water (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E5.AP-278	3.3.1-095	A
Tanks (RWCU Filter Demin Backwash Receiving Tank)	Leakage Boundary	Carbon Steel (with Internal Coating)	Air - Indoor Uncontrolled (External)	Loss of Material	External Surfaces Monitoring of Mechanical Components (B.2.1.24)	VII.I.A-77	3.3.1-078	A
			Treated Water (Internal)	Loss of Coating or Lining Integrity	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E4.A-416	3.3.1-138	E, ~~1~~ 2
				Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.E4.A-414	3.3.1-139	E, ~~1~~ 2

Table 3.3.2-24 Radwaste System (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

1. Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25) program is substituted to manage the aging effect(s) applicable to this component type, material and environment combination. The environment is Raw Water (Potable) that does not have the potential for microbiologically-induced corrosion.

2. Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25) program is substituted to manage the aging effect(s) applicable to this component type, material and environment combination. The environment is Treated Water that does not have the potential for microbiologically-induced corrosion.

SLRA Table 3.3.2-26, Reactor Water Cleanup System, Summary of Aging Management Evaluation, page 3.3-354, is revised as shown below:

Table 3.3.2-26 Reactor Water Cleanup System (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

1. The internal environment of condensation is associated with the air space in the RWCU Filter Demineralizer Precoat Tank. The aging effect on carbon steel (with internal coating) with an internal environment of condensation includes the loss of coating or lining integrity due to blistering, cracking, flaking, peeling, delamination, rusting, physical damage. This aging effect is managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25) program.

2. The internal environment of condensation is associated with the air space in the RWCU Filter Demineralizer Precoat Tank. The aging effect on carbon steel (with internal coating) with an internal environment of condensation includes the loss of material due to general, pitting, and crevice corrosion. This aging effect is managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25) program.

3. The TLAA designation in the Aging Management Program column indicates that fatigue of this component is evaluated in Section 4.3.

4. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25) program is substituted to manage the aging effect(s) applicable to this component type, material, and environment combination. ***The environment is Treated Water that does not have the potential for microbiologically-induced corrosion.***

Change #5 – Reduction of Heat Transfer as an Applicable Aging Effect for Core Spray and RHR Pump Room Cooler Air Intake Screens

Affected SLRA Sections: Table 3.2.1, Table 3.2.2-2, Table 3.2.2-6, Appendix A, Section A.2.1.24, and Appendix B, Section B.2.1.24

SLRA Page Numbers: 3.2-55, 3.2-84, 3.2-92, 3.2-143, 3.2-151, A-34, and B-140

Description of Change:

The Core Spray Pump Room and RHR Pump Room coolers are configured to pass air through the shell side of the heat exchanger and cooling water through the tube side of the heat exchanger. The air intake on the shell side of the units is equipped with debris screens. Although these screens do not perform a pressure boundary function, loss of flow through them due to obstruction could impact the ability of the heat exchangers to perform their heat transfer function. Therefore, reduction of heat transfer is an applicable aging effect for these components that will be managed by the External Surfaces Monitoring of Mechanical Components aging management program.

Accordingly, SLRA Table 3.2.1, Table 3.2.2-2, Table 3.2.2-6, Appendix A, Section A.2.1.24, and Appendix B, Section B.2.1.24 are revised.

SLRA Table 3.2.1, Summary of Aging Management Evaluations for the Engineered Safety Features, page 3.2-55, is revised as shown below:

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
3.2.1-081	Stainless steel, steel, aluminum, copper alloy, titanium heat exchanger tubes exposed to air, condensation	Reduction of heat transfer due to fouling	AMP XI.M36, "External Surfaces Monitoring of Mechanical Components"	No	~~Not Applicable.~~ ~~There are no stainless steel, steel, aluminum, copper alloy, or titanium heat exchanger tubes exposed to air or condensation in Engineered Safety Features systems.~~ ***Consistent with NUREG-2191. The External Surfaces Monitoring of Mechanical Components (B.2.1.24) program will be used to manage reduction of heat transfer of the carbon steel heat exchanger components exposed to air - indoor uncontrolled in the Core Spray System and Residual Heat Removal System.***

SLRA Table 3.2.2-2, Core Spray System, Summary of Aging Management Evaluation, pages 3.2-84 and 3.2-92, are revised as shown below:

Table 3.2.2-2 Core Spray System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Heat Exchanger - (Core Spray Pump Room Cooler) Shell Side Components	***Heat Transfer***	***Carbon Steel***	***Air - Indoor Uncontrolled (External)***	***Reduction of Heat Transfer***	***External Surfaces Monitoring of Mechanical Components (B.2.1.24)***	***V.E.E-424***	***3.2.1-081***	***C, 6***
	Pressure Boundary	Galvanized Steel	Air - Indoor Uncontrolled (External)	None	None	VII.J.AP-13	3.3.1-116	C
			Condensation (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	V.D2.E-27	3.2.1-046	C

Table 3.2.2-2 Core Spray System (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG- 2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

1. The TLAA designation in the Aging Management Program column indicates that fatigue of this component is evaluated in Section 4.3.
2. The Heat Transfer intended function applies only to room coolers 2(3)BE057, 2(3)DE057, 2(3)FE057, 2GE057, and 3HE057.
3. The TLAA designation in the Aging Management Program column indicates that fatigue of this component is evaluated in Section 4.6.
4. The room cooler fins are constructed of 3003 aluminum alloy which is not susceptible to stress corrosion cracking.
5. Flow blockage due to fouling in the ECCS suction strainers will be managed by the ASME Section XI, Subsection IWE (B.2.1.30) program which includes periodic inspections for sludge accumulation on the torus floor and ensures that sludge accumulation rate does not exceed the design basis assumptions used for design, fabrication, and testing of the strainers.
6. ***The portion of the Core Spray Pump Room Cooler shell that serves as the air intake is equipped with debris screens. While these screens do not directly serve a pressure boundary function, they could prevent the coolers from performing their heat transfer function if the air flow through them would become obstructed by debris or other material. Therefore, the external surfaces of the screens are evaluated as having a heat transfer function, and are managed for reduction of heat transfer due to fouling.***

SLRA Table 3.2.2-6, Residual Heat Removal System, Summary of Aging Management Evaluation, pages 3.2-143 and 3.2-151, are revised as shown below:

Table 3.2.2-6 Residual Heat Removal System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Heat Exchanger - (RHR Pump Room Cooler) Shell Side Components	***Heat Transfer***	***Carbon Steel***	***Air - Indoor Uncontrolled (External)***	***Reduction of Heat Transfer***	***External Surfaces Monitoring of Mechanical Components (B.2.1.24)***	***V.E.E-424***	***3.2.1-081***	***C, 6***
	Pressure Boundary	Galvanized Steel	Air - Indoor Uncontrolled (External)	None	None	VII.J.AP-13	3.3.1-116	C
			Condensation (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	V.D2.E-27	3.2.1-046	C

Table 3.2.2-6 Residual Heat Removal System (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

1. The TLAA designation in the Aging Management Programs column indicates that cumulative fatigue damage for this component is evaluated in Section 4.3.

2. The TLAA designation in the Aging Management Programs column indicates that cumulative fatigue damage for this component is evaluated in Section 4.6.

3. The Heat Transfer intended function applies only to room coolers 2(3)AE058, 2(3)DE058, 2(3)FE058, and 2(3)GE058.

4. The room cooler fins are constructed of 3003 aluminum alloy which is not susceptible to stress corrosion cracking.

5. Flow blockage due to fouling in the ECCS suction strainers will be managed by the ASME Section XI, Subsection IWE (B.2.1.30) program which includes periodic inspections for sludge accumulation on the torus floor and ensures that sludge accumulation rate does not exceed the design basis assumptions used for design, fabrication, and testing of the strainers.

6. The portion of the RHR Pump Room Cooler shell that serves as the air intake is equipped with debris screens. While these screens do not directly serve a pressure boundary function, they could prevent the coolers from performing their heat transfer function if the air flow through them would become obstructed by debris or other material. Therefore, the external surfaces of the screens are evaluated as having a heat transfer function, and are managed for reduction of heat transfer due to fouling.

SLRA Appendix A, Section A.2.1.24, External Surfaces Monitoring of Mechanical Components, page A-34, first paragraph, is revised as shown below:

A.2.1.24 External Surfaces Monitoring of Mechanical Components

The External Surfaces Monitoring of Mechanical Components aging management program is a new condition monitoring program that will manage loss of material and cracking of metallic components, as well as loss of material, cracking, and hardening and loss of strength for elastomeric components, loss of preload for HVAC closure bolting, ***reduction of heat transfer for heat exchanger external surfaces exposed to air (room cooler air intake screens),*** and reduced thermal insulation resistance. Periodic visual inspections, not to exceed a refueling outage interval, of metallic components, elastomers, and insulation jacketing (insulation when not jacketed) will be conducted. There are no cementitious components in the scope of this program. This program does not monitor for reduction of heat transfer due to fouling ***for heat exchanger internal surfaces exposed to air.*** ~~;~~ ~~t~~***T***his aging effect will be managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (A.2.1.25) program. This program does not manage cracking due to stress corrosion cracking (SCC) or loss of material in aluminum and SS components exposed to aqueous solutions and air environments containing halides. As discussed in SLRA Sections 3.1.2.2.16, 3.2.2.2.4, 3.3.2.2.3, 3.4.2.2.2, 3.2.2.2.2, 3.3.2.2.4, 3.4.2.2.3, 3.2.2.2.8, 3.3.2.2.8, 3.4.2.2.7, 3.2.2.2.10, 3.3.2.2.10, and 3.4.2.2.9, these aging effects for these materials and environments are managed by the One-Time Inspection (A.2.1.21) program.

SLRA Appendix B, Section B.2.1.24, External Surfaces Monitoring of Mechanical Components, page B-140, first paragraph, is revised as shown below:

B.2.1.24 External Surfaces Monitoring of Mechanical Components

Program Description

The External Surfaces Monitoring of Mechanical Components aging management program is a new condition monitoring program that will consist of visual inspections that are performed during system inspections and walkdowns. The program will consist of periodic visual inspections of metallic and elastomeric components such as piping, piping components, ducting, ducting components, HVAC closure bolting, elastomeric components, and other components within the scope of license renewal. There are no cementitious components in the scope of this program. The program will manage aging effects through visual inspection of external surfaces for evidence of loss of material, and cracking of metallic components, as well as loss of material, cracking, and hardening and loss of strength for elastomers, loss of preload for HVAC closure bolting, ***reduction of heat transfer for heat exchanger external surfaces exposed to air (room cooler air intake screens),*** and reduced thermal insulation resistance. Visual inspections will be augmented by physical manipulation to confirm the absence of hardening and loss of strength of elastomers. This program does not manage reduction of heat transfer due to fouling for heat exchanger **internal** surfaces exposed to air. This aging effect for this component type and environment will be managed by the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25) program.

Change #6 – Addition of Enhancement for Preventative Actions for Bolting Integrity

Affected SLRA Sections: Appendix A, Section A.2.1.30, Appendix A, Section A.2.1.31, Appendix A, Section A.2.1.34, Appendix A, Section A.2.1.35, Appendix A, Section A.5, Appendix B, Section B.2.1.30, Appendix B, Section B.2.1.31, Appendix B, Section B.2.1.34, and Appendix B, Section B.2.1.35

SLRA Page Numbers: A-40, A-41, A-44, A-46, A-106, A-107, A-110, A-111, B-174, B-181, B-199, and B-209

Description of Change:

The Preventative Action element for ASME Section XI, Subsection IWE, ASME Section XI, Subsection IWF, Structures Monitoring, and Inspection of Water-Control Structures Associated with Nuclear Power Plants aging management programs provides preventative actions to provide reasonable assurance that bolting integrity is maintained for high-strength bolting. No corresponding enhancements to the above listed aging management programs are provided in the SLRA to incorporate guidance of standards and emphasis of the recommended preventative actions. A new enhancement is being created for the above listed aging management programs to reflect the use of guidance in the Preventative Action element relative to bolting integrity of high-strength bolts.

Accordingly, SLRA Appendix A, Section A.2.1.30, Appendix A, Section A.2.1.31, Appendix A, Section A.2.1.34, Appendix A, Section A.2.1.35, Appendix A, Section A.5, Appendix B, Section B.2.1.30, Appendix B, Section B.2.1.31, Appendix B, Section B.2.1.34, and Appendix B, Section B.2.1.35 are revised.

SLRA Appendix A, Section A.2.1.30, ASME Section XI, Subsection IWE, page A-40, is revised as shown below to provide an enhancement to address preventative actions for bolting integrity. This SLRA markup also includes the changes discussed in Change #19 below to address the implementation of a one-time supplemental volumetric examination of the containment metal shell and is duplicated here as an aid to the reviewer.

A.2.1.30 ASME Section XI, Subsection IWE

The ASME Section XI, Subsection IWE aging management program is an existing condition monitoring program based on ASME Code and complies with the provisions of 10 CFR 50.55a. The program consists of periodic visual, surface, and volumetric examinations, where applicable, of metallic pressure-retaining components of steel containments for signs of degradation, damage, irregularities, and for coated areas distress of the underlying metal shell, and corrective actions. Acceptability of inaccessible areas of steel containment shell is evaluated when conditions found in accessible areas indicate the presence of, or could result in, flaws or degradation in inaccessible areas.

This program also includes aging management for the potential loss of material due to corrosion in the inaccessible areas of the BWR Mark I steel containment. In addition, the program includes supplemental surface examination to detect cracking for high temperature mechanical penetrations subject to cyclic loading but have no CLB fatigue analysis; and if triggered by plant-specific operating experience, a one-time supplemental volumetric examination by sampling randomly selected as well as focused locations susceptible to loss of thickness due to corrosion of containment shell that is inaccessible from one side. Inspection results are compared with prior recorded results in acceptance of components for continued service.

The ASME Section XI, Subsection IWE aging management program will be enhanced to:

1. Perform surface examinations on accessible portions of high temperature drywell mechanical penetrations, in addition to visual examinations, to detect cracking, once per 10-year interval during the second period of extended operation.

2. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.

3. Implement a one-time supplemental volumetric examination of the containment metal shell surfaces that are inaccessible from one side, if triggered by plant-specific OE. The trigger for this supplemental examination is plant-specific occurrence or recurrence of measurable metal shell corrosion (base metal material loss exceeding 10 percent of nominal plate thickness) initiated on the inaccessible side or areas, identified since the date of issuance of the first renewed license. This supplemental volumetric examination consists of a sample of one-foot square locations that include both randomly-selected and focused

areas most likely to experience degradation based on plant-specific OE and/or other relevant considerations such as environment. The sample size, locations, and any needed scope expansion (based on findings) for this one-time set of volumetric examinations should be determined on a plant-specific basis to demonstrate statistically with 95 percent confidence that 95 percent of the accessible portion of the containment liner is not experiencing corrosion degradation with greater than 10 percent loss of nominal thickness.

~~This enhancement~~ ***These enhancements*** will be implemented no later than six months prior to the second period of extended operation.

SLRA Appendix A, Section A.2.1.31, ASME Section XI, Subsection IWF, page A-41, is revised to include enhancement 4 as shown below.

A.2.1.31 ASME Section XI, Subsection IWF

The ASME Section XI, Subsection IWF aging management program will be enhanced to:

1. Perform periodic evaluations of the acceptability of inaccessible areas of supports (e.g., portions of supports encased in concrete, buried underground, or encapsulated by guard pipe), when conditions exist in accessible areas that could indicate the presence of, or result in, degradation to inaccessible areas of supports. Perform these evaluations once every 10 years during the second period of extended operation.

2. Perform a one-time inspection of an additional five percent of the currently inspected sample size specified in Table IWF-2500-1 for Class 1, 2, and 3 piping supports. Conduct the one-time inspection within the five years prior to entering the second period of extended operation. Select the additional supports from the remaining population of IWF piping supports. Ensure that the sample expansion includes components that are most susceptible to age-related degradation (i.e., based on factors such as time in service, material, and aggressiveness of the environment).

3. Perform VT-3 examinations of all ASTM A-490 bolting materials, used for the reactor vessel support skirts and for the core spray pump supports once per 10-year interval during the second period of extended operation. Perform volumetric examination comparable to that of ASME Code Section XI, Table IWB-2500-1, Examination Category B-G-1, of 12 ASTM A490 bolts at each of the reactor vessel support skirts, once per 10-year interval during the second period of extended operation.

4. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.

These enhancements will be implemented in accordance with the schedule described within the enhancements. Inspections that are required to be performed in the five-year period prior to the second period of extended operation will be completed no later than six months prior to the second period of extended operation, or no later than the last refueling outage prior to the second period of extended operation.

SLRA Appendix A, Section A.2.1.34, Structures Monitoring, page A-44, is revised to include enhancement 13 as shown below.

A.2.1.34 Structures Monitoring

10. Expand the program to monitor elastomeric vibration isolators and bearing pads for cracking, loss of material, and hardening. Supplement visual inspection of elastomeric elements with tactile inspection to detect hardening, if the intended function is suspect. Establish acceptance criteria for elastomeric pads and vibration isolation elements as no loss of material, cracking, or hardening that can lead to loss of isolation or support function.

11. Clarify that loose bolts and nuts and cracked bolts are not acceptable unless accepted by engineering evaluations.

12. Expand the program to inspect the fiberglass outer covering of permanent shielding blankets for signs of tears. If a tear is found, enter the condition into the corrective action program for evaluation. Repair or replace the permanent shielding, unless an evaluation determines that the condition is acceptable.

13. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.

These enhancements will be implemented no later than six months prior to the second period of extended operation. Baseline inspections will be completed no later than six months prior to the second period of extended operation, or no later than the last refueling outage prior to the second period of extended operation.

SLRA Appendix A, Section A.2.1.35, Inspection of Water-Control Structures Associated with Nuclear Power Plants, page A-46, is revised to include enhancement 14 as shown below.

A.2.1.35 Inspection of Water-Control Structures Associated with Nuclear Power Plants

8. Evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence of, or result in, degradation to such inaccessible areas.

9. Document the concrete conditions of submerged concrete structures.

10. Specify a six-year frequency for the inspection of the submerged portions of the traveling screen bays to match the inspection frequency of the submerged portions of the Circulating Water Pump Structure bays.

11. Perform inspections under the enhanced program in order to establish quantitative baseline inspection data prior to the second period of extended operation.

12. Provide evaluation criteria for structural concrete using quantitative second tier criteria of Chapter 5 in ACI 349.3R.

13. Clarify that loose bolts and nuts and cracked bolts are not acceptable unless accepted by engineering evaluations.

14. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.

These enhancements will be implemented no later than six months prior to the second period of extended operation. Baseline inspections will be completed no later than six months prior to the second period of extended operation, or no later than the last refueling outage prior to the second period of extended operation.

SLRA Appendix A, Section A.5, Commitments 30, 31, 34, and 35, on pages A-106, A-107, A-110, and A-111 are revised to include enhancements as shown below. This SLRA markup also includes the changes discussed in Change #19 below to address the implementation of a one-time supplemental volumetric examination of the containment metal shell for item no. 30 and is duplicated here as an aid to the reviewer.

A.5 Second License Renewal Commitment List

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE*	SOURCE
30	ASME Section XI, Subsection IWE	ASME Section XI, Subsection IWE is an existing program that will be enhanced to: 1. Perform surface examinations on accessible portions of high temperature drywell mechanical penetrations, in addition to visual examinations, to detect cracking, once per 10-year interval during the second period of extended operation. ***2. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.*** ***3. Implement a one-time supplemental volumetric examination of the containment metal shell surfaces that are inaccessible from one side, if triggered by plant-specific OE. The trigger for this supplemental examination is plant-specific occurrence or recurrence of measurable metal shell corrosion (base metal material loss exceeding 10 percent of nominal plate thickness) initiated on the inaccessible side or areas, identified since the date of issuance of the first renewed license. This supplemental volumetric examination consists of a sample of one-foot square locations that include both randomly-selected and focused areas most likely to experience degradation based on plant-specific OE and/or other relevant considerations such as environment. The sample size, locations, and any needed scope expansion (based on findings) for this one-time set of volumetric examinations should be determined on a plant-specific basis to demonstrate statistically with 95 percent confidence that 95 percent of the accessible portion of the containment liner is not experiencing corrosion degradation with greater than 10 percent loss of nominal thickness.***	Program will be enhanced no later than six months prior to the second period of extended operation.	Section A.2.1.30 ***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE*	SOURCE
31	ASME Section XI, Subsection IWF	ASME Section XI, Subsection IWF is an existing program that will be enhanced to: 1. Perform periodic evaluations of the acceptability of inaccessible areas of supports (e.g., portions of supports encased in concrete, buried underground, or encapsulated by guard pipe), when conditions exist in accessible areas that could indicate the presence of, or result in, degradation to inaccessible areas of supports. Perform these evaluations once every 10 years during the second period of extended operation. 2. Perform a one-time inspection of an additional five percent of the currently inspected sample size specified in Table IWF-2500-1 for Class 1, 2, and 3 piping supports. Conduct the one-time inspection within the five years prior to entering the second period of extended operation. Select the additional supports from the remaining population of IWF piping supports. Ensure that the sample expansion includes components that are most susceptible to age-related degradation (i.e., based on factors such as time in service, material, and aggressiveness of the environment). 3. Perform VT-3 examinations of all ASTM A-490 bolting materials, used for the reactor vessel support skirts and for the core spray pump supports once per 10-year interval during the second period of extended operation. Perform volumetric examination comparable to that of ASME Code Section XI, Table IWB-2500-1, Examination Category B-G-1, of 12 ASTM A490 bolts at each of the reactor vessel support skirts, once per 10-year interval during the second period of extended operation. ***4. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.***	Program will be enhanced in accordance with the schedule described within the enhancements. Inspections that are required to be performed in the five-year period prior to the second period of extended operation will be completed no later than six months prior to the second period of extended operation, or no later than the last refueling outage prior to the second period of extended operation.	Section A.2.1.31 ***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE*	SOURCE
34	Structures Monitoring	10. Expand the program to monitor elastomeric vibration isolators and bearing pads for cracking, loss of material, and hardening. Supplement visual inspection of elastomeric elements with tactile inspection to detect hardening, if the intended function is suspect. Establish acceptance criteria for elastomeric pads and vibration isolation elements as no loss of material, cracking, or hardening that can lead to loss of isolation or support function. 11. Clarify that loose bolts and nuts and cracked bolts are not acceptable unless accepted by engineering evaluations. 12. Expand the program to inspect the fiberglass outer covering of permanent shielding blankets for signs of tears. If a tear is found, enter the condition into the corrective action program for evaluation. Repair or replace the permanent shielding, unless an evaluation determines that the condition is acceptable. ***13. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.***	Program will be enhanced no later than six months prior to the second period of extended operation. Baseline inspections will be completed no later than six months prior to the second period of extended operation, or no later than the last refueling outage prior to the second period of extended operation.	Section A.2.1.34 ***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE*	SOURCE
35	Inspection of Water-Control Structures Associated with Nuclear Power Plants	8. Evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence of, or result in, degradation to such inaccessible areas. 9. Document the concrete conditions of submerged concrete structures. 10. Specify a six-year frequency for the inspection of the submerged portions of the traveling screen bays to match the inspection frequency of the submerged portions of the Circulating Water Pump Structure bays. 11. Perform inspections under the enhanced program in order to establish quantitative baseline inspection data prior to the second period of extended operation. 12. Provide evaluation criteria for structural concrete using quantitative second tier criteria of Chapter 5 in ACI 349.3R. 13. Clarify that loose bolts and nuts and cracked bolts are not acceptable unless accepted by engineering evaluations. ***14. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.***	Program will be enhanced no later than six months prior to the second period of extended operation. Baseline inspections will be completed no later than six months prior to the second period of extended operation, or no later than the last refueling outage prior to the second period of extended operation.	Section A.2.1.35 ***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

SLRA Appendix B, Section B.2.1.30, ASME Section XI, Subsection IWE, page B-174, is revised as shown below to provide an enhancement to address preventative actions for bolting integrity. This SLRA markup also includes the changes discussed in Change #19 below to address the implementation of a one-time supplemental volumetric examination of the containment metal shell and is duplicated here as an aid to the reviewer.

B.2.1.30 ASME Section XI, Subsection IWE

Enhancements

Prior to the second period of extended operation, the following ~~enhancement~~ ***enhancements*** will be implemented in the following program elements:

1. Perform surface examinations on accessible portions of high temperature drywell mechanical penetrations, in addition to visual examinations, to detect cracking, once per 10-year interval during the second period of extended operation. **Program Elements Affected: Parameters Monitored or Inspected (Element 3) and Detection of Aging Effects (Element 4)**

2. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom. Program Elements Affected: Preventative Action (Element 2)

3. Implement a one-time supplemental volumetric examination of the containment metal shell surfaces that are inaccessible from one side, if triggered by plant-specific OE. The trigger for this supplemental examination is plant-specific occurrence or recurrence of measurable metal shell corrosion (base metal material loss exceeding 10 percent of nominal plate thickness) initiated on the inaccessible side or areas, identified since the date of issuance of the first renewed license. This supplemental volumetric examination consists of a sample of one-foot square locations that include both randomly-selected and focused areas most likely to experience degradation based on plant-specific OE and/or other relevant considerations such as environment. The sample size, locations, and any needed scope expansion (based on findings) for this one-time set of volumetric examinations should be determined on a plant-specific basis to demonstrate statistically with 95 percent confidence that 95 percent of the accessible portion of the containment liner is not experiencing corrosion degradation with greater than 10 percent loss of nominal thickness. Program Elements Affected: Detection of Aging Effects (Element 4)

SLRA Appendix B, Section B.2.1.31, ASME Section XI, Subsection IWF, page B-181, is revised to include enhancement 4 as shown below.

B.2.1.31 ASME Section XI, Subsection IWF

Enhancements

Prior to the second period of extended operation, the following enhancements will be implemented in the following program elements:

1. Perform periodic evaluations of the acceptability of inaccessible areas of supports (e.g., portions of supports encased in concrete, buried underground, or encapsulated by guard pipe), when conditions exist in accessible areas that could indicate the presence of, or result in, degradation to inaccessible areas of supports. Perform these evaluations once every 10 years during the second period of extended operation. **Program Element Affected: Scope of Program (Element 1)**

2. Perform a one-time inspection of an additional five percent of the currently inspected sample size specified in Table IWF-2500-1 for Class 1, 2, and 3 piping supports. Conduct the one-time inspection within five years prior to entering the second period of extended operation. Select the additional supports from the remaining population of IWF piping supports. Ensure that the sample expansion includes components that are most susceptible to age-related degradation (i.e., based on factors such as time in service, material, and aggressiveness of the environment). **Program Element Affected: Detection of Aging Effects (Element 4)**

3. Perform VT-3 examinations of all ASTM A490 bolting materials, used for the reactor vessel support skirts and for the core spray pump supports once per 10-year interval during the second period of extended operation. Perform volumetric examination comparable to that of ASME Code Section XI, Table IWB-2500-1, Examination Category B-G-1, of 12 ASTM A490 bolts at each of the reactor vessel support skirts, once per 10-year interval during the second period of extended operation. **Program Element Affected: Detection of Aging Effects (Element 4)**

4. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom. Program Elements Affected: Preventative Action (Element 2)

SLRA Appendix B, Section B.2.1.34, Structures Monitoring, page B-199, is revised to include enhancement 13 as shown below.

B.2.1.34 Structures Monitoring

10. Expand the program to monitor elastomeric vibration isolators and bearing pads for cracking, loss of material, and hardening. Supplement visual inspection of elastomeric elements with tactile inspection to detect hardening, if the intended function is suspect. Establish acceptance criteria for elastomeric pads and vibration isolation elements as no loss of material, cracking, or hardening that can lead to loss of isolation or support function. **Program Elements Affected: Parameters Monitored or Inspected (Element 3), Detection of Aging Effects (Element 4), and Acceptance Criteria (Element 6)**

11. Clarify that loose bolts and nuts and cracked bolts are not acceptable unless accepted by engineering evaluations. **Program Element Affected: Acceptance Criteria (Element 6)**

12. Expand the program to inspect the fiberglass outer covering of permanent shielding blankets for signs of tears. If a tear is found, enter the condition into the corrective action program for evaluation. Repair or replace the permanent shielding, unless an evaluation determines that the condition is acceptable. **Program Elements Affected: Parameters Monitored or Inspected (Element 3) and Acceptance Criteria (Element 6)**

13. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom. Program Elements Affected: Preventative Action (Element 2)

SLRA Appendix B, Section B.2.1.35, Inspection of Water-Control Structures Associated with Nuclear Power Plants, page B-209, is revised to include enhancement 14 as shown below.

B.2.1.35 Inspection of Water-Control Structures Associated with Nuclear Power Plants

8. Evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence of, or result in, degradation to such inaccessible areas. **Program Element Affected: Detection of Aging Effects (Element 4)**

9. Document the concrete conditions of submerged concrete structures. **Program Element Affected: Detection of Aging Effects (Element 4)**

10. Specify a six-year frequency for the inspection of the submerged portions of the traveling screen bays to match the inspection frequency of the submerged portions of the Circulating Water Pump Structure bays. **Program Element Affected: Detection of Aging Effects (Element 4)**

11. Perform inspections under the enhanced program in order to establish quantitative baseline inspection data prior to the second period of extended operation. **Program Element Affected: Monitoring or Trending (Element 5)**

12. Provide evaluation criteria for structural concrete using quantitative second tier criteria of Chapter 5 in ACI 349.3R. **Program Element Affected: Acceptance Criteria (Element 6)**

13. Clarify that loose bolts and nuts and cracked bolts are not acceptable unless accepted by engineering evaluations. **Program Element Affected: Acceptance Criteria (Element 6)**

14. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom. Program Elements Affected: Preventative Action (Element 2)

Change #7 – Revise SLRA Section 3.3.2.2.9 to Delete the Service Water System

Affected SLRA Sections: 3.3.2.2.9

SLRA Page Numbers: 3.3-60

Description of Change:

SLRA Section 3.3.2.2.9 addresses the loss of material in steel piping, piping components exposed to concrete and potentially exposed to groundwater. It includes the Service Water System in the list of systems addressed by this material and environment combination. As identified in SLRA Section 3.3.2.1.29 and as shown in SLRA Table 3.3.2-29 for the Service Water System, concrete is not an applicable environment for this system.

Accordingly, SLRA Section 3.3.2.2.9 is revised.

SLRA Section 3.3.2.2.9, Loss of Material Due to General, Crevice or Pitting Corrosion and Cracking Due to Stress Corrosion Cracking, fourth paragraph, page 3.3-60, is revised as shown below:

3.3.2.2.9 Loss of Material Due to General, Crevice or Pitting Corrosion and Cracking Due to Stress Corrosion Cracking

Carbon steel piping, piping components exposed to concrete in the Emergency Cooling Water System, Emergency Diesel Generator System, Emergency Service Water System, Fire Protection System, ***and*** High Pressure Service Water System~~, and Service Water System~~ are potentially exposed to groundwater and loss of material is considered to be an applicable aging effect. Loss of material is addressed by Item Number 3.3.1-109. This aging effect is managed by the Buried and Underground Piping and Tanks (B.2.1.28) program.

Change #8 – Additional Maintenance and Operating Experience Information for HVI

Affected SLRA Sections: Section 3.6.2.3.2

SLRA Page Numbers: 3.6-17 through 3.6-20

Description of Change:

The SLRA Section 3.6.2.3.2 discussion for high voltage insulators is being updated to address current maintenance practices and operating experience. Additional maintenance and operating experience is being provided to support the evaluation which determined that there are no high voltage insulator aging effects requiring management, and therefore, no necessity for a High Voltage Insulator aging management program at PBAPS.

Accordingly, SLRA Section 3.6.2.3.2 is revised.

SLRA Section 3.6.2.3.2, High-Voltage Electrical Insulators, pages 3.6-17 through 3.6-20, is revised as shown below.

3.6.2.3.2 High-Voltage Electrical Insulators

Table 3.6.1 Item Numbers 3.6.1-002 and 3.6.1-003 – High-Voltage Electrical Insulators:

The PBAPS in scope high voltage electrical insulators (HVIs)***, which includes in scope medium voltage insulators,*** were evaluated for aging effects requiring management during aging management reviews. The HVIs in scope for license renewal are located in ~~the~~ offsite power source circuits and the alternate AC source for the SBO coping period. The in scope insulators include:

- 500 kV and 220 kV post insulators in offsite source paths 2SU, 343SU, and 3SU.
- 34.5 kV post insulators and strain insulators for the Susquehanna Substation and transmission connection conductor to the adjacent wooden pole,
- 13 kV post insulators and strain insulators for the 13 kV portion of offsite source paths, 2SU, 343SU, and 3SU.

The in scope HVIs provide electrical insulation for switchyard bus, transmission conductors, switchyard active components, and associated connections that are part of the circuits that supply power from electric utility transmission system to plant buses, including connecting the alternate AC source in the event of a station black out. These circuits provide power to in scope license renewal components used for coping during and recovery from a station blackout event and during post fire safe shutdown, when offsite power is credited.

Airborne Contamination

Various airborne materials such as salt, dust, fog, cooling tower plume, foreign debris, or industrial effluents can contaminate insulator surfaces. An excessive buildup of surface contamination enables the conductor voltage to track along the surface more easily and can lead to insulator flashover. The buildup of surface contamination is gradual and in most areas, such contamination is washed away by rain, where the glazed insulator surface aids in contamination removal.

Excessive surface contamination can be a problem in areas where there are greater concentrations of airborne particles such as near the seacoast where salt spray is prevalent, dust, near industrial facilities that discharge airborne pollutants, or at sites where the cooling tower plume may deposit contaminants on switchyard components and transmission lines.

At PBAPS and Susquehanna Substation, the in scope HVIs; the 500 kV, 220 kV, 34.5 kV, and 13 kV post insulators and the 34.5 kV and 13 kV strain insulators, were evaluated for susceptibility to airborne surface contamination from salt, dust, fog, cooling tower plume, foreign debris, and industrial effluents. PBAPS and Susquehanna Substation are not located in an environment conducive to accelerated aging. Considering potential airborne salt contamination, the HVIs are not located near a seacoast or near a brackish waterway. PBAPS and Susquehanna Substation are approximately 10 miles away from the nearest seacoast or brackish waterway (Chesapeake Bay). It is located inland, in south central Pennsylvania where there is no source of airborne salt contamination. Considering potential

airborne particulate contamination from industrial and agricultural activities (i.e., dust, soot), the HVIs are located in an area where industrial airborne particle concentrations and agricultural airborne particle concentrations are comparatively low, since it is located in a rural area with no heavy industry or agricultural pollution nearby. The nearest industrial facility is a clean air, natural gas fired power plant located approximately 2.5 miles away. Considering potential cooling tower plume contamination, the cooling towers at PBAPS are mechanical cooling towers located along the river, at the south end of the site. In scope HVIs are located upriver, at the north end of the site, in transmission substations atop the cliff adjacent to the plant site, and at the Susquehanna Substation and adjacent wooden pole which are approximately 10 miles downriver. The plume from these cooling towers poses no contamination risk to the in scope HVIs because the mechanical cooling towers that are approximately 50 feet in height and are greater than a quarter mile away from the nearest in scope HVIs. These plumes quickly dissipate before reaching the nearest in scope HVIs. Considering potential foreign debris, the HVIs are located in rural area with no heavy industry or urban population centers. The nearest residential community is 3 miles away from PBAPS and 1 mile away from the Susquehanna Substation.

Fog, in and of itself, is not a contaminant for HVIs. Therefore, surface contamination from fog is not an aging effect, is not subject to an aging management review, and does not require aging management.

A ten-year search of operating experience for HVIs was performed. Cumulative build up HVI contamination has not been experienced at PBAPS. Additionally, there are no existing preventive maintenance or inspection tasks that are precluding an occurrence of excessive HVI surface contamination.

Based on PBAPS and the Susquehanna Substation locations, lack of substantial airborne contaminants, and its corroborating operating experience, excessive HVI surface contamination is not expected to occur. HVI surface contamination is not a significant aging effect for PBAPS as noted by recent visual observations of these HVIs in preparation of this application. Therefore, aging effects of surface contamination from salt, dust, fog, cooling tower plume, foreign debris, and industrial effluents are not applicable to PBAPS for the second period of extended operation. No aging management activity is required for the HVIs due to airborne contamination.

In addition, an evaluation was performed for cracking of porcelain. Porcelain cracking or breaking is most commonly caused by an object striking the HVI. Porcelain cracking has also occurred when cement that binds the parts together expands excessively. This phenomenon is known as cement growth; it occurs as a result of improper manufacturing that makes the cement more susceptible to moisture penetration. Plant specific OE shows that porcelain cracking due to cement growth has not occurred at PBAPS. Therefore, cracking caused by physical damage is not an aging effect, is not subject to an aging management review, and does not require aging management.

Loss of Material - Mechanical Wear or Corrosion

Loss of material of HVIs can occur due to oscillating movement of transmission conductors due to significant and sustained winds. Significant wind can result in mechanical wear of metallic parts. Surface corrosion of HVI metallic parts can also occur due to environmental contamination or if galvanized or other protective coatings are worn from significant wind induced movement of transmission conductors.

Mechanical wear is an aging effect for strain insulators in that they are subject to movement. Movement can be caused by wind blowing the supported transmission conductor, causing it to swing. If this swinging is frequent enough, it could cause wear in the metal contact points of the insulator string.

The HVIs to be evaluated for aging effects due to movement of transmission conductors due to significant wind are those conductors with strain HVIs, which for PBAPS and the Susquehanna Substation, only include medium voltage transmission conductors ***(in scope 500 kV and 220 kV insulators are limited to post insulators)***. The in scope strain insulators are for the 34.5 kV transmission connection conductor routed between the Susquehanna Substation and the wooden pole adjacent to the substation and for the 13 kV transmission conductor that traverses the cliff to the west of PBAPS for the 343 startup feed. The 34.5 kV transmission conductors are a connection span of three 34.5 kV 556 kcmil aluminum conductors, approximately 30 feet in length. The 13 kV transmission conductors have a relatively short, two spans of three 13 kV 1590 MCM 54/19 ACSR conductors with lengths of 760 feet and 410 feet. The PECO Transmission and Distribution design practices follow the National Electrical Safety Code (NESC) methodologies. The NESC sets the maximum tension of a conductor to withstand heavy load requirements which includes consideration of oscillating movement of transmission conductors due to significant wind.

Although this loss of material due to mechanical wear or corrosion of the metallic parts of HVIs is possible, experience has shown that the transmission conductors do not normally swing and that when they do, due to significant wind, they do not continue to swing for very long once the wind has subsided. Wind loading, that can cause a transmission line to sway, is considered and minimized during design and installation. In additional, the concerns for transmission conductor to swing is reduced for shorter spans.

In addition, the installed configuration of the strain insulators minimizes movement. This reduces mechanical wear of metallic parts within the strain insulators such that these metallic contact points do not require inspection for mechanical wear. Therefore, aging effects due to loss of material due to mechanical wear is not applicable to PBAPS for the second period of extended operation.

Loss of material due to corrosion of HVIs can also occur due to airborne contamination. A large buildup of contamination could result in corrosion of the metallic parts of the HVIs, which if significant, could impact its structural intended function. As previously evaluated, based on the HVIs' location, lack of airborne contaminants, and its corroborating operating experience, HVI metallic parts are not subject to a large buildup of contamination from airborne contaminants. Therefore, these metallic contact points do not require inspection for corrosion.

HVI metallic part contamination induced corrosion is not a significant aging effect for PBAPS. Therefore, aging effects of surface contamination induced metallic parts corrosion are not applicable to PBAPS for the second period of extended operation.

HVI metallic part aging due to wear from transmission conductor movement, airborne contamination, and surface rust are not significant aging concerns at PBAPS. These conditions have been addressed in design specifications. Visual observations have not identified significant corrosion during routine switchyard inspections, and are further

confirmed as not occurring, per a review of operating experience which did not identify these aging effects as the cause or failure mechanism of documented issues with HVIs. These aging effects are not significant at PBAPS and will not impact intended function of the HVIs during the second period of extended operation. Therefore, aging effects of loss of material due to mechanical wear or corrosion are not applicable to PBAPS for the second period of extended operation.

Operating Experience and Maintenance

The PBAPS substation and transmission components that are in scope for second license renewal have predictive maintenance tasks performed by both PBAPS personnel and PECO Transmission and Distribution (T&D) maintenance crews. Tasks include visual inspection and thermography. There are no preventive measures being implemented (i.e., no routine cleaning of insulators is performed). PBAPS tasks are in place for Maintenance Rule. PECO T&D predictive maintenance tasks are in place as part of routine, normal, good maintenance, utility practices for substation and transmission components and commodities.

When an unacceptable condition or situation is identified, as part of the PBAPS corrective action program, an issue report is created for the abnormal visual inspection or predictive test results. Based on the significance, the corrective action program issue includes an engineering evaluation, an extent of condition review, identification of cause, and corrective actions that may include interim actions until the condition can be repaired.

PBAPS OE issues in the corrective action program were reviewed going back ten years. The OE review also included completion remarks in work orders and industry OE cited in GALL-SLR.

PBAPS corrective action program issues included applicability reviews for industry issues, including an extent of condition review performed to identify if PBAPS had any installed HVIs, potentially subject to a manufacturing material defect, a non-aging issue. It was determined that there are no HVIs with subject material at PBAPS. The review of this industry OE provides evidence that industry OE is evaluated for applicability at PBAPS, to ensure that HVIs are assessed for potential issues, including issues not caused by aging.

PBAPS corrective action program issues also included several occurrences of degradation of 500 kV underhung insulators for circuits that are not in scope of second license renewal. These issues were attributed to the misapplication of hollow core insulators. There are no insulators of this type in the in scope circuits containing HVIs at PBAPS.

During the review of plant specific OE, no onsite occurrences of HVI OE were identified that were attributable to aging. There was no PBAPS plant specific, HVI OE, for second license renewal in scope, as well as not in scope insulators, attributable to either loss of material of metallic parts or reduced insulation resistance.

Conclusion

The main contributor to determining that no AMP is required for HVIs is that there has been no age-related OE for PBAPS high voltage and medium voltage insulators, in scope as well as not in scope, confirming the lack of age degradation that would necessitate an AMP. The operating experience that was reviewed consistently

demonstrated that the non-age-related issues were being identified as part of performing on going, routine predictive maintenance, prior to loss of function. Aging management activities for PBAPS ~~high voltage insulators~~***HVIs*** are not required for the second period of extended operation; therefore, the GALL-SLR report XI.E7 "High Voltage Insulators" aging management program is not applicable to PBAPS.

In addition, to support this conclusion, in accordance with NUREG-2192 requirements, the SSC's including the HVI required to cope with, and recover from, the SBO event are included within the scope of second license renewal. These second license renewal boundaries include components credited to cope with, and recover from, the SBO event were established based on PBAPS current licensing basis consistent with the first license renewal application and aligned with the second license renewal scoping methodology. The HVIs are included in the scope of second license renewal. In NUREG-1769, Safety Evaluation Report (SER) related to license renewal of PBAPS, Section 2.5.1. SER Section 2.5.3 concludes there is reasonable assurance that the applicant has adequately identified the electrical and instrumentation and control SSC's that were within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21 (a)(1). These HVI's are documented as an electrical commodity that the AMR determined the aging effect to be none and, therefore, no aging management activity is required for the HVIs. The evaluations for the first period of extended operation concluded that the HVIs did not require aging management activities to continue to perform their intended function during the first period of extended operation. In agreement with the evaluations performed for the first period of extended operation, airborne contamination and loss of material due to mechanical wear or corrosion are not aging effects requiring management in that they would not cause a loss of intended function if left unmanaged for the second period of extended operation.

Change #9 – Revise SLRA Section 3.4.2.2.8 to Address Loss of Material in Stainless Steel Piping, Piping Components Exposed to Concrete

Affected SLRA Sections: 3.4.2.2.8

SLRA Page Numbers: 3.4-16

Description of Change:

The subject of SLRA Section 3.4.2.2.8 is loss of material and cracking in steel and stainless steel piping, piping components exposed to concrete and potentially exposed to groundwater. The discussion for Table 3.4.1 Item Number 3.4.1-082 refers to Item Number 3.4.1-072 for cracking but does not cite a similar item for loss of material. The discussion for Table 3.4.1 Item Number 3.4.1-082 should also refer to Item Number 3.4.1-047 for the loss of material.

Accordingly, SLRA Section 3.4.2.2.8 is revised.

SLRA Section 3.4.2.2.8, Loss of Material Due to General, Crevice or Pitting Corrosion and Cracking Due to Stress Corrosion Cracking, fourth paragraph, page 3.4-16, is revised as shown below:

3.4.2.2.8 Loss of Material Due to General, Crevice or Pitting Corrosion and Cracking Due to Stress Corrosion Cracking

Table 3.4.1 Item Number 3.4.1-082: This item evaluates stainless steel piping, piping components exposed to the concrete environment. Cracking due to SCC and loss of material are not considered to be applicable aging effects for portions of the stainless steel piping, piping components exposed to concrete that is outdoors and above ground level in the Condensate Storage System since: (a) attributes of the concrete are consistent with American Concrete Institute (ACI) 318 or ACI 349 (low water-to-cement ratio, low permeability, and adequate air entrainment) as cited in NUREG–1557; (b) plant-specific OE indicates no degradation of the concrete that could lead to penetration of water to the metal surface; and (c) the piping is not potentially exposed to groundwater. Portions of the stainless steel piping, piping components in the Condensate Storage System that are exposed to concrete and are outdoors and below ground level are susceptible to cracking due to SCC ***and loss of material*** because they are potentially exposed to groundwater, and are addressed by Item Number***s*** 3.4.1-072 ***and 3.4.1-047, respectively***.

Change #10 – Addition of Loss of Preload Aging Effect in Bronze Hatch/Plug Bolting in the Circulating Water Pump Structure

Affected SLRA Sections: Table 3.5.1, Table 3.5.2-3, and Appendix B, Section B.2.1.34

SLRA Page Numbers: 3.5-102, 3.5-103, 3.5-127, and B-197

Description of Change:

SLRA Table 3.5.2-3, Circulating Water Pump Structure, Summary of Aging Management Evaluation, includes the component type of Hatches/Plugs. These components include bronze bolting in Air – Indoor Uncontrolled and Air – Outdoor environments with no aging effects. The bronze bolting should include the aging effect of loss of preload managed by the Structures Monitoring program.

Accordingly, SLRA Table 3.5.1, Table 3.5.2-3, and Appendix B, Section B.2.1.34 are revised.

SLRA Table 3.5.1, Summary of Aging Management Evaluations for the Containments, Structures and Component Supports, pages 3.5-102 and 3.5-103, are revised as shown below:

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-088	Structural bolting	Loss of preload due to self-loosening	AMP XI.S6, "Structures Monitoring"	No	Consistent with NUREG-2191. The Structures Monitoring (B.2.1.34) program will be used to manage loss of preload for structural bolting and anchors made from aluminum, brass, ***bronze,*** carbon and low alloy steel, galvanized steel, stainless steel; metal components- cable trays and wireway gutters; panels, racks, frames, cabinets, and other enclosures; roofing; ***hatches/plugs;*** spent fuel pool gates; structural miscellaneous – siding and vents; bolted connections for supports for cable trays, conduit, HVAC components and ducts, tube track, instrument tubing, non-ASME piping and components, sliding support bearings and surfaces, emergency diesel generator, and other mechanical equipment; bolted connections for supports for platforms, pipe whip restraints, jet impingement shields, masonry walls, and other structures; bolted connections for supports for racks, panels, cabinets, and enclosures for electrical equipment and instrumentation exposed to air- indoor uncontrolled, air- outdoor, raw water, and treated water in the Administration Building and Shop, Boiler House, Circulating Water Pump Structure, Containment Structure, Dewatering Building, Diesel Generator

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
					Building, Emergency Cooling Tower and Reservoir, Nitrogen Storage Building, Outdoor Electric Switchgear, North Substation, Radwaste Building and Reactor Auxiliary Bay, Reactor Building, Recombiner Building, Stack, Station Blackout Structure and Foundations, Turbine Building and Main Control Room Complex, and Yard Structures, as well as the commodity groups for Component Supports, Electrical and Instrumentation Enclosures and Raceways, Hazard Barriers and Elastomers, and Miscellaneous Steel. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.13) program has been substituted and will be used to manage loss of preload of the stainless steel structural bolting exposed to air – indoor uncontrol and treated water in the Fuel Handling System.

SLRA Table 3.5.2-3, Circulating Water Pump Structure, Summary of Aging Management Evaluation, page 3.5-127, is revised as shown below:

Table 3.5.2-3 Circulating Water Pump Structure (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Hatches/Plugs	Flood Barrier Missile Barrier Shelter and Protection Structural Support	Bronze Bolting	Air - Indoor Uncontrolled	***Loss of Preload***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-261***	***3.5.1-088***	***A***
				None	None	IV.E.R-453	3.1.1-137	C
			Air - Outdoor	***Loss of Preload***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-261***	***3.5.1-088***	***A***
				None	None	IV.E.R-453	3.1.1-137	C

SLRA Appendix B, Section B.2.1.34, Structures Monitoring, Program Description, eighth paragraph, page B-197, is revised as shown below:

B.2.1.34 Structures Monitoring

Program Description

Applicable metallic materials within the scope of this program include: aluminum, carbon steel, ductile iron, galvanized steel, and stainless steel; applicable bolting materials include: aluminum, brass, ***bronze,*** carbon steel, galvanized steel, and stainless steel. Applicable non-metallic materials within the scope of this program include: reinforced concrete, elastomer, fiberglass, grout, and Lubrite.

Change #11 – Addition of Plant Specific Notes for Grade 2 Titanium

Affected SLRA Sections: Table 3.3.2-13, Table 3.3.2-21, Table 3.4.2-4

SLRA Page Numbers: 3.3-318, 3.3-321, 3.3-244, 3.3-247, 3.3-249, 3.4-80, and 3.4-84

Description of Change:

SLRA Tables 3.3.2-13, 3.3.2-21, and 3.4.2-4 include component types (other than heat exchanger tubes) constructed of titanium and exposed to treated water. There are no aging effects identified for these titanium components. NUREG-2191 indicates that there are no aging effects for titanium grades 1, 2, 7, 9, 11, or 12 in treated water; however, the SLRA tables do not identify the grade of titanium. A plant specific note is being added to these tables identifying the titanium as grade 2.

Accordingly, SLRA Table 3.3.2-13, Table 3.3.2-21, and Table 3.4.2-4 are revised.

SLRA Table 3.3.2-13, Emergency Service Water System, Summary of Aging Management Evaluation, pages 3.3-244, 3.3-247, and 3.3-249 are revised as shown below:

Table 3.3.2-13 Emergency Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Piping, piping components	Leakage Boundary	Titanium	Air - Indoor Uncontrolled (External)	None	None	VII.J.AP-160	3.3.1-122	A
			Treated Water (Internal)	None	None	VII.J.A-766	3.3.1-237	A, ***2***

Table 3.3.2-13 Emergency Service Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Valve Body	Leakage Boundary	Titanium	Air - Indoor Uncontrolled (External)	None	None	VII.J.AP-160	3.3.1-122	A
			Treated Water (Internal)	None	None	VII.J.A-766	3.3.1-237	A, ***2***

Table 3.3.2-13 Emergency Service Water System (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

1. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25) program is substituted to manage the aging effect(s) applicable to this component type, material and environment combination.

2. Components are constructed of grade 2 titanium.

SLRA Table 3.3.2-21, Process Sampling System, Summary of Aging Management Evaluation, pages 3.3-318 and 3.3-321 are revised as shown below:

Table 3.3.2-21 Process Sampling System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Piping, piping components	Leakage Boundary	Titanium	Air - Indoor Uncontrolled (External)	None	None	VII.J.AP-160	3.3.1-122	A
			Treated Water (Internal)	None	None	VII.J.A-766	3.3.1-237	A, ***2***

Table 3.3.2-21 Process Sampling System (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

1. The TLAA designation in the Aging Management Program column indicates that fatigue of this component is evaluated in Section 4.3.

2. Components are constructed of grade 2 titanium.

SLRA Table 3.4.2-4, Main Condenser System, Summary of Aging Management Evaluation, pages 3.4-80 and 3.4-84 are revised as shown below. This SLRA markup also includes the changes discussed in Change #2 above to address applicability of cracking for titanium Heat Exchanger tubes, and is duplicated here as an aid to the reviewer.

Table 3.4.2-4 Main Condenser System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Heat Exchanger - (Main Condenser) Tube Sheet	Holdup	Titanium	Raw Water (Internal)	Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VIII.E.S-478b	3.4.1-130	A
			Treated Water (External)	None	None	VIII.I.S-463	3.4.1-115	A, ***3***
Heat Exchanger - (Main Condenser) Tubes	Holdup	Titanium	Raw Water (Internal)	Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25)	VII.C1.A-736	3.3.1-207	A
			Treated Water (External)	***Cracking***	***One-Time Inspection (B.2.1.21)***	***VIII.E.S-462***	***3.4-1-114***	***A***
					Water Chemistry (B.2.1.2)	***VIII.E.S-462***	***3.4-1-114***	***B***
				None	None	VIII.E.S-462	3.4.1-114	I, 1

Table 3.4.2-4 Main Condenser System (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

1. The component performs an intended function of holdup only and therefore, the aging effects of ~~cracking and~~ reduction of heat transfer due to fouling ~~are~~ ***is*** not applicable.
2. The rupture disks are constructed of 3003 aluminum alloy which is not susceptible to stress corrosion cracking.
3. ***Components are constructed of grade 2 titanium.***

Change #12 – Revise SLRA Table 3.5.2-22 to Use Line Items Associated with Steel Tank Foundations

Affected SLRA Sections: Table 2.4-22, Section 3.5.2.2.2.1, Table 3.5.1, and Table 3.5.2-22

SLRA Page Numbers: 2.4-70, 3.5-38 to 3.5-40, 3.5-42 to 3.5-44, 3.5-74, 3.5-77, 3.5-88 to 3.5-92, and 3.5-279 to 3.5-285

Description of Change:

Structure elements associated with Group 8 structures (steel tanks and missile barriers) were not separately identified using line items associated with Group 8 structures during the Aging Management Review phase of the PBAPS SLR project. This change involves revising the Table 3.5.2-22 line items for the steel tank foundations (condensate, refueling water, and diesel fuel oil storage tanks) in scope for License Renewal, which are identified under Yard Structures (Manholes, Duct Banks, Valve Pits, etc.) in Table 3.5.2-22. These Table 3.5.2-22 line items are revised from Group 3 structure lines to Group 8 structure lines. In order to allow for the separate identification of all the elements associated with steel tank foundations, additional component types are created just for these components, e.g., Bolting (Structural – Storage Tanks). As part of these changes, editorial revisions are made to improve consistency of the component type names associated with tank foundations. The changes from Group 3 to Group 8 structure lines affected Table 3.5.1 line summaries that are revised accordingly to identify Group 8 structures and make similar changes to applicable further evaluations regarding Group 8 structures. The addition of the component types in Table 3.5.2-22 also affects Table 2.4-22 that is revised to reflect the additional component types.

Accordingly, SLRA Table 2.4-22, Section 3.5.2.2.2.1, Table 3.5.1, and Table 3.5.2-22 are revised.

SLRA Table 2.4-22, Yard Structures (Manholes, Duct Banks, Valve Pits, etc.), Components Subject to Aging Management Review, page 2.4-70 is revised as shown below. This SLRA markup to Table 2.4-22 also includes the changes, discussed in Change #15 below to address the aging management of accessible concrete for the aging effect of "Increase in Porosity and Permeability; Loss of Strength/Leaching of Calcium Hydroxide and Carbonation," and is duplicated here as an aid to the reviewer.

Table 2.4-22 **Yard Structures (Manholes, Duct Banks, Valve Pits, etc.)**
Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Bolting (Structural-Storage Tanks)	***Structural Support***
Concrete elements: All (Foundation Condensate ***and Refueling Water*** Storage Tanks)	Structural Support
Concrete elements: All (Foundation Diesel ***Fuel Oil*** Storage Tanks)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Anchors (Storage Tanks)	***Structural Support***
Concrete elements: Curbs	Direct Flow
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Concrete: Basemat, Foundation, Subfoundation (accessible areas)	Structural Support
Concrete: Basemat, Foundation, Subfoundation (inaccessible areas)	Structural Support
Concrete: Below-grade exterior (inaccessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior (accessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Concrete: Interior (inaccessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Equipment supports and foundations (Storage Tanks)	***Structural Support***
Manholes, Handholes & Duct Banks	Shelter and Protection, Structural Support
Steel components: structural steel	Structural Support
Steel components: structural steel (Storage Tanks)	***Structural Support***

SLRA Section 3.5.2.2.2.1, Aging Management of Inaccessible Areas, item #1, first paragraph, page 3.5-38; item #2, first and third paragraphs on pages 3.5-39 and 3.5-40; as well as item #4, first, fifth, and last paragraphs on pages 3.5-42 to 3.5-44, are revised as shown below:

3.5.2.2.2.1 Aging Management of Inaccessible Areas

1. *Loss of material (spalling, scaling) and cracking due to freeze-thaw could occur in below-grade inaccessible concrete areas of Groups 1–3, 5 and 7–9 structures. Further evaluation is recommended of this aging effect for inaccessible areas of these Groups of structures for plants located in moderate to severe weathering conditions.*

   [First Paragraph]

   Table 3.5.1 Item Number 3.5.1-042: This aging effect and mechanism, the loss of material (spalling, scaling) and cracking due to freeze-thaw, is applicable to PBAPS reinforced concrete structures. PBAPS is located in a region where weathering conditions are considered severe as shown in ASTM C33. The Structures Monitoring (B.2.1.34) program will be used to manage loss of material (spalling, scaling) and cracking in both accessible and inaccessible areas of reinforced concrete for the Groups 2, 3, ***8,*** and 9 structures. At PBAPS, the there are no stand-alone Group 1 or 5 structures, which at PBAPS, are part of the Group 2 Reactor Buildings. PBAPS does not have any Group 7 ~~or 8~~ structures. None of these structures are completely inaccessible, and there are significant portions of the structures that are accessible that provide indications of reinforced concrete conditions in inaccessible areas.

2. *Cracking due to expansion and reaction with aggregates could occur in inaccessible concrete areas for Groups 1–5 and 7–9 structures. Further evaluation is recommended of inaccessible areas of these Groups of structures to determine if a plant-specific AMP is required to manage this aging effect.*

   [First Paragraph]

   Table 3.5.1 Item Number 3.5.1-043: This aging effect and mechanism, cracking due to expansion and reaction with aggregates, is considered applicable to PBAPS reinforced concrete structures. The Structures Monitoring (B.2.1.34) program will be used to manage cracking due to expansion and reaction with aggregates in both accessible and inaccessible areas of reinforced concrete for the Groups 2, 3, 4, ***8,*** and 9 structures. At PBAPS, the there are no stand-alone Group 1 or 5 structures, which at PBAPS, are part of the Group 2 Reactor Buildings. PBAPS does not have any Group 7 ~~or 8~~ structures. None of these structures are completely inaccessible, and there are significant portions of the structures that are accessible. The accessible portions of the structures provide indications of reinforced concrete conditions in inaccessible areas.

[Third Paragraph]

Cracking associated with expansion due to reaction with aggregates has not been observed on PBAPS Group 2, 3, 4, ***8,*** and 9 concrete structures. Nevertheless, the Structures Monitoring (B.2.1.34) program continues to inspect and monitor reinforced concrete structures for cracking due to any mechanism. The condition of accessible and above grade concrete is used as an indicator for the condition of the inaccessible and below grade structural components and provides reasonable assurance that degradation of inaccessible structural components will be detected before a loss of an intended function. If cracking due to expansion and reaction with aggregates were significant, pattern cracking would be expected over most of the surfaces at grade level where the moisture level is higher. This has not occurred. The Group 6 structures, Circulating Water Pump Structure and the Emergency Cooling Tower and Reservoir, which have higher exposure to water compared to other reinforced concrete structures at PBAPS, may be used as leading structures to indicate the presence of expansion and reaction with aggregates for the other reinforced concrete structures that are in scope, as described in Subsection 3.5.2.2.2.3.2

4. *Increase in porosity and permeability, and loss of strength due to leaching of calcium hydroxide and carbonation could occur in below-grade inaccessible concrete areas of Groups 1–5 and 7–9 structures. Further evaluation is recommended if leaching is observed in accessible areas that impact intended functions.*

[First Paragraph]

Table 3.5.1 Item Number 3.5.1-047: This aging effect and mechanism, increase in porosity and permeability and loss of strength due to leaching of calcium hydroxide and carbonation, is considered applicable to PBAPS reinforced concrete structures. The Structures Monitoring (B.2.1.34) program will be used to manage the increase in porosity and permeability and loss of strength due to leaching of calcium hydroxide and carbonation in both accessible and inaccessible areas for the Groups 2, 3, ***8,*** and 9 structures. At PBAPS, the there are no stand-alone Group 1 or 5 structures, which at PBAPS, are part of the Group 2 Reactor Buildings. PBAPS does not have any Group 7 ~~or 8~~ structures. This Item Number does not apply to the Group 4 structures due to the Mark I containment design. None of these structures are completely inaccessible, and there are significant portions of the structures that are accessible that provide indications of reinforced concrete conditions in inaccessible areas.

[Fifth Paragraph]

Inaccessible below-grade reinforced concrete for Groups 2, 3, ***8,*** and 9 structures is subject to an aggressive environment. Tet results for groundwater and raw water samples taken between 2016 and 2018 showed pH limits are safely above the threshold limit for pH > 5.5, and sulfates are safely lower than the threshold limit for sulfates <1500 ppm and this would indicate a non- aggressive environment. Chlorides in a minority of groundwater testing wells exceed the threshold limit for chlorides < 500 ppm, which indicates an aggressive environment. All of the raw water tests, e.g., river water, were safely less than the threshold limit for chlorides < 500 ppm which indicates a non-

aggressive environment. Therefore, only the ground water is considered to be aggressive and only for high chloride levels. High chloride levels are a concern as a potential initiator of reinforcing steel corrosion that could be initially detected as cracking and spalling of concrete. The groundwater at PBAPS is not aggressive with respect to pH or sulfates. Therefore, increase in porosity and permeability and loss of strength due to leaching is not expected.

[Last Paragraph]

The Structures Monitoring (B.2.1.34) program will continue to manage the increase in porosity and permeability and loss of strength due to leaching of calcium hydroxide and carbonation in both accessible and inaccessible areas of Groups 2, 3, ***8,*** and 9 structures. In addition, PBAPS will continue will examine exposed portions of the below-grade concrete, when excavated for any reason. Therefore, no additional measures for managing the aging effect of increase in porosity and permeability, and loss of strength for concrete are required for inaccessible areas of Groups 1, 2, 3, 8, and 9 structures.

SLRA Table 3.5.1, Summary of Aging Management Evaluations for the Containments, Structures and Component Supports, pages 3.5-74, 3.5-77, and 3.5-88 to 3.5-92, are revised as shown below. This SLRA markup to Table 3.5.1, Item 3.5.1-063, also includes the changes, discussed in Change #15 below to address the aging management of accessible concrete for the aging effect of "Increase in Porosity and Permeability; Loss of Strength/Leaching of Calcium Hydroxide and Carbonation," and is duplicated here as an aid to the reviewer.

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-042	Groups 1-3, 5, 7-9: concrete (inaccessible areas): foundation	Loss of material (spalling, scaling) and cracking due to freeze-thaw	Plant-specific aging management program	Yes	The Structures Monitoring (B.2.1.34) program will be used to manage loss of material (spalling, scaling) and cracking of the reinforced concrete in inaccessible areas exposed to an air - outdoor environment in Group 2, 3, ***8,*** and 9 structures. PBAPS used Group 2 Item Numbers instead of Group 1 or 5 Item Numbers. PBAPS does not have Group 7~~ and 8~~ structures. See Subsection 3.5.2.2.2.1.1.

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-047	Groups 1-5, 7-9: concrete (inaccessible areas): exterior above- and below-grade; foundation	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	Plant-specific aging management program	Yes	The Structures Monitoring (B.2.1.34) program will be used to manage increase in porosity and permeability, loss of strength of the reinforced concrete basemat, foundation, subfoundation, below-grade exterior concrete (inaccessible areas), duct banks, manholes, and handholes exposed to water- flowing in Groups 2, 3, ***8,*** and 9 structures. PBAPS used Group 2 Item Numbers instead of Group 1 or 5 Item Numbers. PBAPS does not have Group 7 ~~and 8~~ structures. This Item Number does not apply to the Group 4 concrete structures because of the Mark I containment design. See Subsection 3.5.2.2.2.1.4.

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-063	Groups 1-3, 5, 7-9: concrete (accessible areas): exterior above- and below-grade; foundation	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S6, "Structures Monitoring"	No	Consistent with NUREG-2191. The Structures Monitoring (B.2.1.34) program will be used to manage increase in porosity and permeability, loss of strength of the grout and reinforced concrete ***exterior above- and below-grade,*** basemat, foundation, subfoundation (accessible areas), ~~interior,~~ equipment supports and foundations, and penetration Seals exposed to water - flowing in Groups 2, 3, ***8,*** and 9 structures, and the Hazard Barriers and Elastomers commodity group. At PBAPS, the there are no stand-alone Group 1 or 5 structures, which are part of the Group 2 Reactor Buildings. Group 7 ~~and 8~~ structures are not applicable to PBAPS.

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-064	Groups 1-3, 5, 7-9: concrete (accessible areas): exterior above- and below-grade; foundation	Loss of material (spalling, scaling) and cracking due to freeze-thaw	AMP XI.S6, "Structures Monitoring"	No	Consistent with NUREG-2191. The Structures Monitoring (B.2.1.34) program will be used to manage cracking and loss of material of the grout and reinforced concrete elements of the condensate storage tank foundation, curbs, above-grade exterior (accessible areas), basemat, foundation, subfoundation (accessible areas), interior (accessible areas), equipment supports and foundations, hatches/plugs, manholes, handholes & duct banks, penetration seals, and precast beams and panels exposed to air- outdoor in the Group 2, 3, ***8,*** and 9 structures, and the Hazard Barriers and Elastomers commodity group. At PBAPS, the there are no stand-alone Group 1 or 5 structures, which are part of the Group 2 Reactor Buildings. Group 7 ~~and 8~~ structures are not applicable to PBAPS.

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-065	Groups 1-3, 5, 7-9: concrete (inaccessible areas): below-grade exterior; foundation, Groups 1-3, 5, 7-9: concrete (accessible areas): below-grade exterior; foundation, Groups 6: concrete (inaccessible areas): all	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No	Consistent with NUREG-2191. The Structures Monitoring (B.2.1.34) program will be used to manage cracking, loss of bond, and loss of material at reinforced concrete elements for Groups 2, 3, ***8,*** and 9: at inaccessible areas of concrete below-grade exterior, basemat, foundation, and subfoundation; and Group 6 and other concrete for Hazard Barriers and Component Supports in accessible and inaccessible areas above-grade and below-grade exterior, interior, basemat, foundation, and subfoundation as well tank foundations, curbs, duct banks, equipment supports and foundations, manholes, handholes, and duct banks, penetration seals, and at locations of expansion and grouted anchors and grout pads; exposed to air - indoor uncontrolled, air - outdoor, and groundwater/soil environments. At PBAPS, the there are no stand-alone Group 1 or 5 structures, which are part of the Group 2 Reactor Buildings. Group 7 ~~and 8~~ structures are not applicable to PBAPS.

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-066	Groups 1-5, 7, 9: concrete (accessible areas): interior and above-grade exterior	Cracking; loss of bond; and loss of material (spalling, scaling) due to corrosion of embedded steel	AMP XI.S6, "Structures Monitoring"	No	Consistent with NUREG-2191. The Structures Monitoring (B.2.1.34) program will be used to manage cracking, loss of bond, and loss of material of Groups 2, 3, 4, and 9 concrete, grout, and reinforced concrete elements: for concrete above-grade exterior (accessible areas and inaccessible areas); concrete: basemat, foundation, and subfoundation (accessible areas and inaccessible areas); concrete: Interior, (accessible areas and inaccessible areas); and other concrete for curbs, equipment supports and foundations, hatches/plugs, manholes, handholes, and duct banks, and precast concrete- beams and panels; as well as grout for penetration seals for the Hazard Barriers and Elastomers commodity group. These areas are exposed to air - indoor uncontrolled and air - outdoor environments. At PBAPS, the there are no stand-alone Group 1 or 5 structures, which are part of the Group 2 Reactor Buildings. Group 7 ~~and 8~~ structures are not applicable to PBAPS.

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-067	Groups 1-5, 7, 9: Concrete: interior; above-grade exterior, Groups 1-3, 5, 7-9 - concrete (inaccessible areas): below-grade exterior; foundation, Group 6: concrete (inaccessible areas): all	Increase in porosity and permeability; cracking; loss of material (spalling, scaling) due to aggressive chemical attack	AMP XI.S6, "Structures Monitoring"	No	Consistent with NUREG-2191. The Structures Monitoring (B.2.1.34) program will be used to manage increase in porosity and permeability, cracking, and loss of material (spalling, scaling) of the reinforced concrete components for Groups 2, 3, ***8,*** and 9: concrete below-grade exterior (inaccessible areas), basemat, foundation, subfoundation (accessible and inaccessible areas); Group 6 inaccessible concrete elements; as well as other concrete such as tank foundations, curbs, equipment supports and foundations, manholes, and handholes, and duct banks exposed to groundwater/soil. At PBAPS, the there are no stand-alone Group 1 or 5 structures, which are part of the Group 2 Reactor Buildings. Group 7 ~~and 8~~ structures are not applicable to PBAPS. This mechanism is only associated with exposure to groundwater at PBAPS so it does not apply to Group 4 concrete components, which are not exposed to groundwater.

SLRA Table 3.5.2-22, Yard Structures (Manholes, Duct Banks, Valve Pits, etc.), Summary of Aging Management Evaluation, pages 3.5-279, 3.5-280, 3.5-283, 3.5-284, and 3.5-285, are revised as shown below. This SLRA markup to Table 3.5.2-22 also includes the changes, discussed in Change #15 below to address the aging management of accessible concrete for the aging effect of "Increase in Porosity and Permeability; Loss of Strength/Leaching of Calcium Hydroxide and Carbonation," and is duplicated here as an aid to the reviewer.

Table 3.5.2-22

Yard Structures (Manholes, Duct Banks, Valve Pits, etc.)

Summary of Aging Management Evaluation

Table 3.5.2-22 Yard Structures (Manholes, Duct Banks, Valve Pits, etc.)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Bolting (Structural-Storage Tanks)	***Structural Support***	***Galvanized Steel Bolting***	***Air - Outdoor***	***Loss of Material***	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-274***	***3.5.1-082***	***A***
				Loss of Preload	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-261***	***3.5.1-088***	***A***
Concrete elements: All (Foundation Condensate ***and Refueling Water*** Storage Tanks)	Structural Support	Reinforced concrete	Air - Outdoor	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-26	3.5.1-066	A
				Cracking	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-25	3.5.1-054	A
				Loss of Material (Spalling, Scaling) and Cracking	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-23	3.5.1-064	A
			Groundwater/Soil	Cracking and Distortion	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-30	3.5.1-044	A
				Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	***III.A8.TP-27***	***3.5.1-065***	***A***
						III.~~A3~~***A8***.TP-212	3.5.1-065	A
				Cracking	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-204	3.5.1-043	A
				Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-29	3.5.1-067	A
				Loss of Material (Spalling, Scaling) and Cracking	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-108***	***3.5.1-042***	***A***
			Water - Flowing	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-24***	***3.5.1-063***	***A, 1***
						III.A8.TP-67	***3.5.1-047***	***A, 1***

Table 3.5.2-22 Yard Structures (Manholes, Duct Banks, Valve Pits, etc.) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete elements: All (Foundation Diesel ***Fuel Oil*** Storage Tanks)	Structural Support	Reinforced concrete	Groundwater/Soil	Cracking and Distortion	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-30	3.5.1-044	A
				Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	***III.A8.TP-27***	***3.5.1-065***	***A***
						III.~~A3~~***A8***.TP-212	3.5.1-065	A
				Cracking	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-204	3.5.1-043	A
				Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-29	3.5.1-067	A
				Loss of Material (Spalling, Scaling) and Cracking	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-108***	***3.5.1-042***	***A***
			Water - Flowing	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-24***	***3.5.1-063***	***A, 1***
						III.A8.TP-67	***3.5.1-047***	***A, 1***
Concrete elements: Anchors	Structural Support	Carbon and Low Alloy Steel Bolting	Air - Outdoor	Loss of Material	Structures Monitoring (B.2.1.34)	III.A3.TP-274	3.5.1-082	A
				Loss of Preload	Structures Monitoring (B.2.1.34)	III.A3.TP-261	3.5.1-088	A
Concrete elements: Anchors (Storage Tanks)	***Structural Support***	***Carbon and Low Alloy Steel Bolting***	***Air - Outdoor***	***Loss of Material***	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-274***	***3.5.1-082***	***A***
				Loss of Preload	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-261***	***3.5.1-088***	***A***

Table 3.5.2-22 Yard Structures (Manholes, Duct Banks, Valve Pits, etc.) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 1***
Concrete: Interior (accessible areas)	Missile Barrier Shelter and Protection Structural Support	Reinforced concrete	Air - Indoor Uncontrolled	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-26	3.5.1-066	A
				Cracking	Structures Monitoring (B.2.1.34)	III.A3.TP-25	3.5.1-054	A
Concrete: Interior (inaccessible areas)	Missile Barrier Shelter and Protection Structural Support	Reinforced concrete	Air - Indoor Uncontrolled	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-26	3.5.1-066	C
				Cracking	Structures Monitoring (B.2.1.34)	III.A3.TP-204	3.5.1-043	A
Equipment supports and foundations (Storage Tanks)	***Structural Support***	***Carbon Steel***	***Air - Outdoor***	***Loss of Material***	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-302***	***3.5.1-077***	***A***

Table 3.5.2-22 Yard Structures (Manholes, Duct Banks, Valve Pits, etc.) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Steel components: structural steel	Structural Support	Galvanized Steel	Air - Outdoor	Loss of Material	Structures Monitoring (B.2.1.34)	III.B2.TP-6	3.5.1-093	A
Steel components: structural steel (Storage Tanks)	***Structural Support***	***Galvanized Steel***	***Air - Outdoor***	***Loss of Material***	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-302***	***3.5.1-077***	***A***

Table 3.5.2-22 Yard Structures (Manholes, Duct Banks, Valve Pits, etc.) (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

~~None.~~

1. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34) program.

Change #13 – Addition of Exception for Flow Blockage Due to Fouling

Affected SLRA Sections: Appendix B, Section B.2.1.30

SLRA Page Numbers: B-173, B-174

Description of Change:

The scope of the Peach Bottom ASME Section XI, Subsection IWE aging management program includes the management of flow blockage due to fouling for the Core Spray System, High Pressure Coolant Injection System, Reactor Core Isolation Cooling System, and Residual Heat Removal System pump suction strainers located in the suppression pool. There are no GALL SLR line items that manage flow blockage due to fouling for these components and as a result, there is no GALL aging management program specified to perform the associated management activities. Therefore, this change creates a second exception to the ASME Section XI, Subsection IWE aging management program to perform the aging management of this function. This program was selected because the station Containment Inservice Inspection requirements described in the Augmented Inspection program plan and procedures will address the aging management actions as part of the containment activities described below. All (100%) of the strainer assemblies shall be visually inspected during each interval for general structural condition, and one strainer module (screen) in the RHR system and one strainer module (screen) in the Core Spray system shall be inspected for debris during every other refueling outage. The HPCI and RCIC strainers shall be inspected for debris during every other refueling outage.

Accordingly, SLRA Appendix B, Section B.2.1.30 is revised.

SLRA Appendix B, Section B.2.1.30, ASME Section XI, Subsection IWE, beginning on page B-173, is revised in paragraph 1 and to include exception 2 as shown below.

B.2.1.30 ASME Section XI, Subsection IWE

NUREG-2191 Consistency

The ASME Section XI, Subsection IWE aging management program will be consistent with the ten elements of aging management program XI.S1, "ASME Section XI, Subsection IWE" specified in NUREG-2191 with the following ~~exception~~ ***exceptions***.

Exceptions to NUREG-2191

1. NUREG-2191 states that steel, stainless steel, and dissimilar metal weld pressure-retaining components that are subject to cyclic loading but have no CLB fatigue analysis, are monitored for cracking and are supplemented with surface examination (or other applicable technique) in addition to visual examination to detect cracking. Peach Bottom does not monitor for cracking utilizing supplemental surface examinations except at high temperature mechanical penetrations. **Program Elements Affected: Parameters Monitored or Inspected (Element 3) and Detection of Aging Effects (Element 4)**

Justification for Exception

The PBAPS drywell contains stainless steel penetration sleeves, dissimilar metal welds, and steel components that are subject to cyclic loading but have no current licensing basis fatigue analysis. The Peach Bottom primary containment was designed in accordance with ASME Section III, 1965 edition and applicable addenda through the Summer 1966 edition. No fatigue analysis or exemption/waiver was required per this code year or original construction specifications as permitted by later code year editions. PBAPS has performed an assessment that has shown that had the drywell been designed to ASME Section III, 1974 edition, it would have met the criteria in subsection NE-3222.4(d) 'Vessel not requiring analysis for cyclic operation'. The criteria that were met to address this condition included: 1) atmospheric to operating pressure cycle, 2) normal operation pressure fluctuation, 3) temperature difference – startup and shutdown, 4) temperature difference – normal operation, 5) temperature difference – dissimilar metals, and 6) mechanical loads. This drywell fatigue waiver assessment concluded that the components that could be subject to cyclic loading, but have no current licensing basis fatigue analysis, are subjected to an acceptable and negligible amount of fatigue, and therefore no visual or surface examinations will be performed. The assessment did not include drywell penetration bellows which have fatigue analysis and penetration adapters of high temperature drywell mechanical penetrations.

The majority of the surface of these components are not accessible for visual inspection or surface examination for cracking due to the Mark I containment design. The program will be enhanced to perform surface examinations on accessible portions of drywell high temperature mechanical penetrations in addition to visual examinations to detect cracking for penetrations that could be subject to cyclic loading but have no CLB fatigue analysis. Original design and installation specifications for containment penetration components such as bellows, welds, and penetration adapters required initial surface examinations to ensure no flaws existed as part of initial installation. Appropriate integrated and local leak rate testing is conducted for pressure boundary components per the 10 CFR 50 Appendix J aging management program. Through-wall cracking would be detected by the type A integrated leak rate test. Additionally, VT-3

examinations are performed on accessible portions of the containment penetrations in accordance with the IWE program. Peach Bottom has not experienced a failure of the above listed containment components and integrated leak rate test results have shown significant margin. Industry operating experience has also shown strong performance of the subject primary containment components. License renewal applications for other similar Mark I containments designed to later code years have credited fatigue waivers. The design of penetrations where fatigue waivers are not credited limit loads from the piping onto the drywell by either using bellows or installation of small bore diameter pipe. Therefore, the existing 10 CFR Part 50 Appendix J leak testing and ASME Section XI, Subsection IWE, are adequate to detect cracking without requiring surface examination of these containment components subjected to low levels of fatigue.

2. The NUREG-2191 Chapter XI.S1, ASME Section XI, Subsection IWE aging management program does not manage the aging effect of flow blockage due to fouling. The scope of the ASME Section XI, Subsection IWE aging management program will manage flow blockage due to fouling for the Core Spray System, High Pressure Coolant Injection System, Reactor Core Isolation Cooling System, and Residual Heat Removal System pump suction strainers located in the suppression pool. Program Elements Affected: Scope of Program (Element 1), Parameters Monitored or Inspected (Element 3), Detection of Aging Effects (Element 4), and Acceptance Criteria (Element 6)

Justification for Exception

The scope of the ASME Section XI, Subsection IWE aging management program will include the management of flow blockage due to fouling for the for the Core Spray System, High Pressure Coolant Injection System, Reactor Core Isolation Cooling System, and Residual Heat Removal System pump suction strainers located in the suppression pool. No existing GALL line items exist for the management of flow blockage due to fouling for these components and as a result, there is no GALL aging management program specified to perform the associated management activities. The ASME Section XI, Subsection IWE aging management program was selected because the station Containment ISI program plan and procedures will perform the required aging management actions. The suction strainer inspections are performed as an augmented inspection program requirement, which is an inspection performed by above and beyond the requirements of ASME Section XI.

Change #14 – Revise SLRA Table 3.5.2-5 Line Items Associated with Refueling Bellows

Affected SLRA Sections: Table 3.5.1, Table 3.5.2-5

SLRA Page Numbers: 3.5-73, 3.5-110, 3.5-166, and 3.5-170

Description of Change:

Aging management of steel elements associated with the stainless steel refueling bellows is updated to be associated with the One-Time Inspection aging management program instead of referring to the Structures Monitoring aging management program. This change involves revising the Table 3.5.2-5 line items for the steel elements associated with the stainless steel refueling bellows in Table 3.5.2-5. These Table 3.5.2-5 line items are revised to conform to the lines used for other stainless steel, structural elements. This revision affects Table 3.5.1. In addition, a plant specific note was revised to specifically address the existing monitoring of the refueling bellows.

Accordingly, SLRA Table 3.5.1 and Table 3.5.2-5 have been revised.

SLRA Table 3.5.1, Summary of Aging Management Evaluations for the Containments, Structures and Component Supports, pages 3.5-73 and 3.5-110, are revised as shown below:

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports

Item Number	Component	Aging Effect/Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-039	Steel elements: vent line bellows	Cracking due to SCC	AMP XI.S1, "ASME Section XI, Subsection IWE," and AMP XI.S4, "10 CFR Part 50, Appendix J"	Yes	Consistent with NUREG-2191 with exceptions. The 10 CFR Part 50, Appendix J (B.2.1.32) program and ASME Section XI, Subsection IWE (B.2.1.30) program will be used to manage cracking of the stainless steel elements: vent line, header, and bellows exposed to air - indoor uncontrolled in the Containment Structure. Exceptions apply to the NUREG-2191 recommendations for ASME Section XI, Subsection IWE (B.2.1.30) program implementation. ~~The Structures Monitoring (B.2.1.34) program has been substituted and will be used to manage cracking of the stainless steel elements of the refueling bellows assemblies exposed to air – indoor uncontrolled in the Containment Structure.~~ See Subsection 3.5.2.2.1.6.

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.5.1-100	Aluminum, stainless steel support members; welds; bolted connections; support anchorage to building structure	Loss of material due to pitting and crevice corrosion, cracking due to SCC	AMP XI.M32, "One-Time Inspection," AMP XI.S6, "Structures Monitoring," or AMP XI.M36, "External Surfaces Monitoring of Mechanical Components"	Yes	Consistent with NUREG-2191. The One-Time Inspection (B.2.1.21) program will be used to manage cracking and loss of material of aluminum and stainless steel members and bolting, for embedments; conduit; equipment storage racks, expansion joints, fuel storage racks, hatches and plugs, hazard barriers, metal components- cable trays, wireway gutters, poles, and outdoor structures; insulation and insulation jacketing; panels, racks, frames, cabinets, and other enclosures; penetration seals; roofing; spent fuel pool gates; steel elements- liner, liner anchors, ~~and~~ integral attachments, ***and refueling bellows***; structural miscellaneous - shielding, siding, and vents; supports for cable trays, conduit, HVAC ducts, tube track, instrument tubing, and non-ASME piping and components exposed to air-indoor uncontrolled and air- outdoor environments in the Circulating Water Pump Structure, ***Containment,*** Outdoor Electric Switchgear, North Substation, Radwaste Building and Reactor Auxiliary Bay, Reactor Building, Recombiner Building, Stack, Station Blackout Structure and Foundations, and Turbine Building and Main Control Room Complex, as well as commodity groups Component Supports, Electrical and Instrumentation Enclosures and Raceways, Hazard Barriers and Elastomers, Insulation, and Miscellaneous Steel.

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports					
Item Number	**Component**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
					The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.13) program has been substituted and will be used to manage cranes, hoists, and their associated structural bolting for loss of material in aluminum and cracking and loss of material in stainless steel exposed to air – indoor uncontrolled for the Fuel Handling System. See Subsection 3.5.2.2.2.4.

SLRA Table 3.5.2-5, Containment Structure, Summary of Aging Management Evaluation, pages 3.5-166 and 3.5-170, are revised as shown below:

Table 3.5.2-5 Containment Structure (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Steel elements: Refueling Bellows assemblies	Water Retaining Boundary	Stainless Steel	Air - Indoor Uncontrolled	Cracking	~~Structures Monitoring (B.2.1.34)~~ ***One-Time Inspection (B.2.1.21)***	~~II.B1.1.CP-50~~ ***III.B2.T-37a***	~~3.5.1-039~~ ***3.5.1-100***	~~E~~***A***, 4, 5
				Loss of Material	***One-Time Inspection (B.2.1.21)***	***III.B2.T-37a***	***3.5.1-100***	***A, 4, 5***

Table 3.5.2-5 Containment Structure (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

1. The Structures Monitoring (B.2.1.34) program is used to manage the aging effect of reduction of strength due to irradiation for this component type, material, and environment combination.

2. The TLAA designation in the Aging Management Programs column indicates fatigue of this component is evaluated in Section 4.6.

3. The sliding supports and bearings for drywell steel beams do not use Lubrite or similar material but are instead steel to steel connections. The Structures Monitoring (B.2.1.34) program is substituted to manage the aging effects of this applicable to this component type, material, and environment combination.

4. The normal environment for this component is Air-Indoor, Uncontrolled. The treated water environment exists only on a short term basis during refueling outages, and therefore, it is not addressed separately for aging management.

5. ~~The Structures Monitoring (B.2.1.34) program is substituted to manage the applicable aging effects for this component type, material, and environment combination.~~ ***This component is not in low-flow or stagnant areas since the area is drained upon completion of the refueling outage and heat from the reactor pressure vessel causes rapid evaporation of any moisture remaining in the bellows. Plant-specific operating experience reviews have not identified any failures or leakage from the refueling bellows as described in SLRA section 3.5.2.2.1.3 Item 1, and any such failures would be detected by monitoring of water level in the spent fuel pool and as well as by reactor cavity and bellows leakage detection instrumentation that alarms in the main control room.***

Change #15 – Revise SLRA to Include the Aging Effect, "Increase in Porosity and Permeability, and Loss of Strength Due to Leaching of Calcium Hydroxide and Carbonation" for Accessible, Exterior Concrete

Affected SLRA Sections:

- Tables 2.4-1, 2.4-2, 2.4-7, 2.4-13, 2.4-14, 2.4-15, 2.4-16, 2.4-17, 2.4-18, 2.4-19, 2.4-20, 2.4-21, 2.4-22
- Section 3.5.2.1.21
- Table 3.5.1
- Tables 3.5.2-1, 3.5.2-2, 3.5.2-7, 3.5.2-13, 3.5.2-14, 3.5.2-15, 3.5.2-16, 3.5.2-17, 3.5.2-18, 3.5.2-19, 3.5.2-20, 3.5.2-21, 3.5.2-22

SLRA Page Numbers:

- 2.4-3, 2.4-6, 2.4-25, 2.4-42, 2.4-45, 2.4-48, 2.4-52, 2.4-56, 2.4-58, 2.4-61, 2.4-65, 2.4-67, 2.4-70
- 3.5-25, 3.5-88, 3.5-114, 3.5-115, 3.5-117, 3.5-120, 3.5-176, 3.5-177, 3.5-217, 3.5-219, 3.5-222, 3.5-225, 3.5-228, 3.5-233, 3.5-237, 3.5-248, 3.5-251, 3.5-255, 3.5-258, 3.5-261, 3.5-264, 3.5-269, 3.5-272, 3.5-276, 3.5-277, 3.5-278, 3.5-279, 3.5-280, 3.5-283, 3.5-284, and 3.5-285

Description of Change:

To demonstrate GALL SLR Table 1 Item Number 3.5.1-063 consistency, and to explicitly identify that the following aging effect, "increase in porosity and permeability, and loss of strength due to leaching of calcium hydroxide and carbonation," is addressed for accessible, exterior concrete, additional lines are added to the tables in SLRA section 3.5.2 for the applicable structures. A component type of "Concrete: Exterior above- and below-grade; foundation (accessible areas)" is added for this aging effect and mechanism for each structure affected by this change. A new plant specific note is added to clarify the environment used for this component type and aging mechanism combination. The addition of these new line items in the 3.5.2 tables affect the corresponding tables in section 2.4 for the affected structures. The Table 3.5.1, Item 3.5.1-063 is revised to reflect these changes.

For consistency, the line for the subject aging effect in Table 3.5.2-19 for the Station Blackout Structure and Foundation, which was applied to interior concrete, is deleted since it is unnecessary.

Accordingly, the following SLRA tables and sections are revised:

- Tables 2.4-1, 2.4-2, 2.4-7, 2.4-13, 2.4-14, 2.4-15, 2.4-16, 2.4-17, 2.4-18, 2.4-19, 2.4-20, 2.4-21, 2.4-22
- Section 3.5.2.1.21
- Table 3.5.1
- Tables 3.5.2-1, 3.5.2-2, 3.5.2-7, 3.5.2-13, 3.5.2-14, 3.5.2-15, 3.5.2-16, 3.5.2-17, 3.5.2-18, 3.5.2-19, 3.5.2-20, 3.5.2-21, 3.5.2-22

SLRA Table 2.4-1, Administration Building and Shop, Components Subject to Aging Management Review, page 2.4-3, is revised as shown below:

Table 2.4-1 **Administration Building and Shop**
Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Structural Support
Concrete: Basemat, Foundation, Subfoundation (accessible areas)	Structural Support
Concrete: Basemat, Foundation, Subfoundation (inaccessible areas)	Structural Support
Concrete: Below-grade exterior (inaccessible areas)	Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior (accessible areas)	Structural Support
Concrete: Interior (inaccessible areas)	Structural Support
Masonry walls: Exterior	Structural Support
Masonry walls: Interior	Structural Support
Piles	Structural Support
Steel components: structural steel	Structural Support
Structural Miscellaneous - Decking	Structural Support

SLRA Table 2.4-2, Boiler House, Components Subject to Aging Management Review, page 2.4-6, is revised as shown below:

Table 2.4-2 **Boiler House**
Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Shelter and Protection, Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Shelter and Protection, Structural Support
Concrete: Basemat, Foundation, Subfoundation (inaccessible areas)	Shelter and Protection, Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior (accessible areas)	Structural Support
Concrete: Interior (inaccessible areas)	Structural Support
Equipment supports and foundations	Structural Support
Metal components	Shelter and Protection, Structural Support
Precast Concrete- Beams and Panels	Shelter and Protection
Steel components: structural steel	Structural Support
Structural Miscellaneous - Decking	Shelter and Protection
Structural Miscellaneous - Siding	Shelter and Protection

SLRA Table 2.4-7, Diesel Generator Building, Components Subject to Aging Management Review, page 2.4-25, is revised as shown below:

Table 2.4-7 **Diesel Generator Building**
Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Structural Support
Concrete: Basemat, Foundation, Subfoundation (inaccessible areas)	Flood Barrier, Shelter and Protection, Structural Support
Concrete: Below-grade exterior (inaccessible areas)	Flood Barrier, Shelter and Protection, Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior (accessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Structural Support
Equipment supports and foundations	Structural Support
Metal components	Shelter and Protection
	Structural Support
Piles	Structural Support
Steel components: structural steel	Missile Barrier
	Structural Support
Structural Miscellaneous- Decking	Structural Support

SLRA Table 2.4-13, Nitrogen Storage Building, Components Subject to Aging Management Review, page 2.4-42, is revised as shown below:

Table 2.4-13 **Nitrogen Storage Building**
Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Concrete: Basemat, Foundation, Subfoundation (accessible areas)	Shelter and Protection, Structural Support
Concrete: Basemat, Foundation, Subfoundation (inaccessible areas)	Shelter and Protection, Structural Support
Concrete: Below-grade exterior (inaccessible areas)	Shelter and Protection, Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior (accessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Concrete: Interior (inaccessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Equipment supports and foundations	Structural Support

SLRA Table 2.4-14, Outdoor Electric Switchgear, North Substation, Components Subject to Aging Management Review, page 2.4-45, is revised as shown below:

Table 2.4-14 Outdoor Electric Switchgear, North Substation
Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Shelter and Protection, Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Shelter and Protection, Structural Support
Concrete: Basemat, Foundation, Subfoundation	Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior	Structural Support
Manholes, Handholes & Duct Banks	Shelter and Protection, Structural Support
Metal components (includes poles and outdoor structures)	Structural Support
Roofing	Shelter and Protection
Steel components: structural steel	Structural Support
Structural Miscellaneous - Siding	Shelter and Protection

SLRA Table 2.4-15, Radwaste Building and Reactor Auxiliary Bay, Components Subject to Aging Management Review, page 2.4-48, is revised as shown below:

Table 2.4-15 Radwaste Building and Reactor Auxiliary Bay
Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Curbs	Direct Flow
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Shielding, Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Shielding, Structural Support
Concrete: Basemat, Foundation, Subfoundation (inaccessible areas)	Flood Barrier, Shelter and Protection, Structural Support
Concrete: Below-grade exterior (inaccessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior (accessible areas)	Flood Barrier, HELB/MELB Shielding, Missile Barrier, Shelter and Protection, Shielding, Structural Support
Concrete: Interior (inaccessible areas)	Flood Barrier, HELB/MELB Shielding, Missile Barrier, Shelter and Protection, Shielding, Structural Support
Doors (special shield doors)	Missile Barrier
	Shelter and Protection
	Shielding
Equipment supports and foundations	Structural Support
Hatches/Plugs	HELB/MELB Shielding
	Shelter and Protection, Structural Support
Masonry walls: Interior	Shielding
	Structural Support
Metal components	Shelter and Protection, Structural Support
Metal components (missile shield)	Missile Barrier
Precast Concrete- Beams and Panels	Flood Barrier
	Shelter and Protection, Structural Support
Sliding surfaces	Expansion/Separation
Steel components: structural steel	Flood Barrier
	Structural Support
Structural Miscellaneous - Decking (floor)	Structural Support
Structural Miscellaneous - Decking (roof)	Structural Support
Structural Miscellaneous - Shielding	Shielding, Structural Support
Structural Miscellaneous - Siding	Shelter and Protection

SLRA Table 2.4-16, Reactor Building, Components Subject to Aging Management Review, page 2.4-52, is revised as shown below:

Table 2.4-16 Reactor Building
Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Curbs	Direct Flow
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Shielding, Structural Pressure Barrier, Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Shielding, Structural Pressure Barrier, Structural Support
Concrete: Basemat, Foundation, Subfoundation (inaccessible areas)	Flood Barrier, Shelter and Protection, Structural Pressure Barrier, Structural Support
Concrete: Below-grade exterior (inaccessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Structural Pressure Barrier, Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior (accessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Shielding, Structural Pressure Barrier, Structural Support
	HELB/MELB Shielding
Concrete: Interior (inaccessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Shielding, Structural Pressure Barrier, Structural Support
	HELB/MELB Shielding
Equipment Storage Racks (inside spent fuel pool and reactor well)	Structural Support
Equipment supports and foundations	Structural Support
Fuel Storage Racks (New Fuel)	Structural Support
Fuel Storage Racks (Spent Fuel)	Structural Support
Fuel Storage Racks: neutron absorbing sheets	Absorb Neutrons
Hatches/Plugs	Flood Barrier, Missile Barrier, Shelter and Protection, Shielding, Structural Pressure Barrier, Structural Support
Hatches/Plugs (reactor well)	Shielding
	Water Retaining Boundary
Masonry walls: Interior	HELB/MELB Shielding
	Shelter and Protection, Structural Support
	Shielding

SLRA Table 2.4-17, Recombiner Building, Components Subject to Aging Management Review, page 2.4-56, is revised as shown below:

Table 2.4-17 Recombiner Building
Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Curbs	Direct Flow
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Shelter and Protection, Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Shelter and Protection, Structural Support
Concrete: Basemat, Foundation, Subfoundation (inaccessible areas)	Shelter and Protection, Structural Support
Concrete: Below-grade exterior (inaccessible areas)	Shelter and Protection, Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior (accessible areas)	Shelter and Protection, Structural Support
Concrete: Interior (inaccessible areas)	Shelter and Protection, Structural Support
Equipment supports and foundations	Structural Support
Hatches/Plugs	Shelter and Protection, Structural Support
Masonry walls: Exterior	Shelter and Protection, Structural Support
Masonry walls: Interior	Shelter and Protection, Structural Support
Metal components	Structural Support
Precast Concrete- Beams and Panels	Shelter and Protection, Structural Support
Steel components: structural steel	Structural Support
Structural Miscellaneous - Decking (roof)	Shelter and Protection, Structural Support
Structural Miscellaneous - Siding	Shelter and Protection, Structural Support
Structural Miscellaneous - Vents (blowout panel)	Pressure Relief, Shelter and Protection

SLRA Table 2.4-18, Stack, Components Subject to Aging Management Review, page 2.4-58, is revised as shown below:

Table 2.4-18 **Stack**
Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Gaseous Release Path
	Shelter and Protection, Shielding, Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Gaseous Release Path
	Shelter and Protection, Shielding, Structural Support
Concrete: Basemat, Foundation, Subfoundation (accessible areas)	Structural Support
Concrete: Basemat, Foundation, Subfoundation (inaccessible areas)	Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior (accessible areas)	Gaseous Release Path
	Shelter and Protection, Shielding, Structural Support
Concrete: Interior (inaccessible areas)	Gaseous Release Path
	Shelter and Protection, Shielding, Structural Support
Hatches/Plugs	Direct Flow, Shelter and Protection
Roofing	Shelter and Protection
Steel components: structural steel	Structural Support
Structural Miscellaneous - Siding	Shelter and Protection

SLRA Table 2.4-19, Station Blackout Structure and Foundations, Components Subject to Aging Management Review, page 2.4-61, is revised as shown below:

Table 2.4-19 Station Blackout Structure and Foundations
Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Structural Support
Concrete: Below-grade exterior (inaccessible areas)	Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior	Structural Support
Conowingo Hydroelectric Plant (Dam)	Shelter and Protection, Structural Support
Duct Banks	Shelter and Protection
Equipment supports and foundations	Structural Support
Manholes, Handholes & Duct Banks	Shelter and Protection, Structural Support
Metal components	Structural Support
Structural Miscellaneous - Decking (Roof)	Shelter and Protection, Structural Support
Structural Miscellaneous - Siding	Shelter and Protection, Structural Support

SLRA Table 2.4-20, Turbine Building and Main Control Room Complex, Components Subject to Aging Management Review, page 2.4-65, is revised as shown below:

Table 2.4-20 Turbine Building and Main Control Room Complex Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Curbs	Direct Flow
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Shielding, Structural Pressure Barrier, Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Flood Barrier, Missile Barrier, Shelter and Protection, Shielding, Structural Pressure Barrier, Structural Support
Concrete: Basemat, Foundation, Subfoundation (inaccessible areas)	Shelter and Protection, Structural Support
Concrete: Below-grade exterior (inaccessible areas)	Shelter and Protection, Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior (accessible areas)	HELB/MELB Shielding
	Missile Barrier, Shelter and Protection, Shielding, Structural Pressure Barrier, Structural Support
Concrete: Interior (inaccessible areas)	HELB/MELB Shielding
	Missile Barrier, Shelter and Protection, Shielding, Structural Pressure Barrier, Structural Support
Equipment supports and foundations	Structural Support
Hatches/Plugs	Shelter and Protection, Shielding, Structural Support
Masonry walls: Interior	Shelter and Protection, Shielding, Structural Support
Metal components	Structural Support
Precast Concrete- Beams and Panels	Shelter and Protection, Shielding, Structural Support
Sliding surfaces	Structural Support
Steel components: structural steel	Structural Support
Structural Miscellaneous - Decking	Shelter and Protection, Structural Support
Structural Miscellaneous - Missile Barrier	Missile Barrier
Structural Miscellaneous - Shielding	Shielding
Structural Miscellaneous - Siding	Shelter and Protection

SLRA Table 2.4-21, Watertight Dikes, Components Subject to Aging Management Review, page 2.4-67, is revised as shown below:

Table 2.4-21 Watertight Dikes
Components Subject to Aging Management Review

Component Type	Intended Function
Concrete: Above-grade exterior (accessible areas)	Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Structural Support
Concrete: Below-grade exterior (inaccessible areas)	Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***

SLRA Table 2.4-22, Yard Structures (Manholes, Duct Banks, Valve Pits, etc.), Components Subject to Aging Management Review, page 2.4-70 is revised as shown below. This SLRA markup to Table 2.4-22 also includes the changes discussed in Change #12 above to separately identify line items associated with Group 8 structures, and is duplicated here as an aid to the reviewer.

Table 2.4-22 **Yard Structures (Manholes, Duct Banks, Valve Pits, etc.)**
Components Subject to Aging Management Review

Component Type	Intended Function
Bolting (Structural)	Structural Support
Bolting (Structural-Storage Tanks)	***Structural Support***
Concrete elements: All (Foundation Condensate ***and Refueling Water*** Storage Tanks)	Structural Support
Concrete elements: All (Foundation Diesel ***Fuel Oil*** Storage Tanks)	Structural Support
Concrete elements: Anchors	Structural Support
Concrete elements: Anchors (Storage Tanks)	***Structural Support***
Concrete elements: Curbs	Direct Flow
Concrete elements: Embedments	Structural Support
Concrete: Above-grade exterior (accessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Concrete: Above-grade exterior (inaccessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Concrete: Basemat, Foundation, Subfoundation (accessible areas)	Structural Support
Concrete: Basemat, Foundation, Subfoundation (inaccessible areas)	Structural Support
Concrete: Below-grade exterior (inaccessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***
Concrete: Interior (accessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Concrete: Interior (inaccessible areas)	Missile Barrier, Shelter and Protection, Structural Support
Equipment supports and foundations (Storage Tanks)	***Structural Support***
Manholes, Handholes & Duct Banks	Shelter and Protection, Structural Support
Steel components: structural steel	Structural Support
Steel components: structural steel (Storage Tanks)	***Structural Support***

SLRA Section 3.5.2.1.21, Watertight Dikes, Environments section and Aging Effects Requiring Management section, page 3.5-25, is revised as shown below:

3.5.2.1.21 Watertight Dikes

Environments

The Watertight Dikes components are exposed to the following environments:

- Air - Outdoor
- Groundwater/Soil
- ***Water - Flowing***

Aging Effects Requiring Management

The following aging effects associated with the Watertight Dikes components require management:

- Cracking
- Cracking and Distortion
- Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)
- Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scaling)
- ***Increase in Porosity and Permeability, Loss of Strength***
- Loss of Material (Spalling, Scaling) and Cracking

SLRA Table 3.5.1, Summary of Aging Management Evaluations for the Containments, Structures and Component Supports, page 3.5-88, Item Number 3.5.1-063, is revised as shown below. This SLRA markup to Table 3.5.1 also includes the changes, discussed in Change #12 above to separately identify line items associated with Group 8 structures, and is duplicated here as an aid to the reviewer.

Table 3.5.1 Summary of Aging Management Evaluations for the Containments, Structures and Component Supports

Item Number	Component	Aging Effect/Mechanism	Aging Programs	Further Evaluation Recommended	Discussion
3.5.1-063	Groups 1-3, 5, 7-9: concrete (accessible areas): exterior above- and below-grade; foundation	Increase in porosity and permeability; loss of strength due to leaching of calcium hydroxide and carbonation	AMP XI.S6, "Structures Monitoring"	No	Consistent with NUREG-2191. The Structures Monitoring (B.2.1.34) program will be used to manage increase in porosity and permeability, loss of strength of the grout and reinforced concrete ***exterior above- and below-grade,*** basemat, foundation, subfoundation (accessible areas), ~~interior,~~ equipment supports and foundations, and penetration Seals exposed to water - flowing in Groups 2, 3, ***8,*** and 9 structures, and the Hazard Barriers and Elastomers commodity group. At PBAPS, the there are no stand-alone Group 1 or 5 structures, which are part of the Group 2 Reactor Buildings. Group 7 ~~and 8~~ structures are not applicable to PBAPS.

SLRA Table 3.5.2-1, Administration Building and Shop, Summary of Aging Management Evaluation, pages 3.5-114 and 3.5-115, are revised as shown below:

Table 3.5.2-1 Administration Building and Shop (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 1***
Concrete: Interior (accessible areas)	Structural Support	Reinforced concrete	Air - Indoor Uncontrolled	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-26	3.5.1-066	A
				Cracking	Structures Monitoring (B.2.1.34)	III.A3.TP-25	3.5.1-054	A

Table 3.5.2-1 Administration Building and Shop (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

~~None.~~

1. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34) program.

SLRA Table 3.5.2-2, Boiler House, Summary of Aging Management Evaluation, pages 3.5-117 and 3.5-120, are revised as shown below:

Table 3.5.2-2 Boiler House (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 1***
Concrete: Interior (accessible areas)	Structural Support	Reinforced concrete	Air - Indoor Uncontrolled	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-26	3.5.1-066	A
				Cracking	Structures Monitoring (B.2.1.34)	III.A3.TP-25	3.5.1-054	A

Table 3.5.2-2 Boiler House (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

~~None.~~

1. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34) program.

SLRA Table 3.5.2-7, Diesel Generator Building, Summary of Aging Management Evaluation, pages 3.5-176 and 3.5-177, are revised as shown below:

Table 3.5.2-7 Diesel Generator Building (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Below-grade exterior (inaccessible areas)	Flood Barrier Shelter and Protection Structural Support	Reinforced concrete	Water - Flowing	Increase in Porosity and Permeability, Loss of Strength	Structures Monitoring (B.2.1.34)	III.A3.TP-67	3.5.1-047	A
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 1***

Table 3.5.2-7 Diesel Generator Building (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

~~None.~~

1. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34) program.

SLRA Table 3.5.2-13, Nitrogen Storage Building, Summary of Aging Management Evaluation, pages 3.5-217 and 3.5-219, are revised as shown below:

Table 3.5.2-13 Nitrogen Storage Building (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 1***
Concrete: Interior (accessible areas)	Missile Barrier Shelter and Protection Structural Support	Reinforced concrete	Air - Indoor Uncontrolled	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-26	3.5.1-066	A
				Cracking	Structures Monitoring (B.2.1.34)	III.A3.TP-25	3.5.1-054	A

Table 3.5.2-13 Nitrogen Storage Building (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

~~None.~~

1. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34) program.

SLRA Table 3.5.2-14, Outdoor Electric Switchgear, North Substation, Summary of Aging Management Evaluation, pages 3.5-222 and 3.5-225, are revised as shown below:

Table 3.5.2-14 Outdoor Electric Switchgear, North Substation (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 1***
Concrete: Interior	Structural Support	Reinforced concrete	Air - Indoor Uncontrolled	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-26	3.5.1-066	A
				Cracking	Structures Monitoring (B.2.1.34)	III.A3.TP-25	3.5.1-054	A

Table 3.5.2-14 Outdoor Electric Switchgear, North Substation (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

~~None.~~

1. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34) program.

SLRA Table 3.5.2-15, Radwaste Building and Reactor Auxiliary Bay, Summary of Aging Management Evaluation, pages 3.5-228 and 3.5-233, are revised as shown below:

Table 3.5.2-15 Radwaste Building and Reactor Auxiliary Bay (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Below-grade exterior (inaccessible areas)	Flood Barrier Missile Barrier Shelter and Protection Structural Support	Reinforced concrete	Groundwater/Soil	Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-29	3.5.1-067	A
			Water - Flowing	Increase in Porosity and Permeability, Loss of Strength	Structures Monitoring (B.2.1.34)	III.A3.TP-67	3.5.1-047	A
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 2***

Table 3.5.2-15 Radwaste Building and Reactor Auxiliary Bay (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

1. Support design allows for movement, but does not use Lubrite or similar material, instead consists of steel to steel sliding connection. The Structures Monitoring (B.2.1.34) program is substituted to manage the aging effects of this applicable to this component type, material, and environment combination.

2. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34) program.

SLRA Table 3.5.2-16, Reactor Building, Summary of Aging Management Evaluation, pages 3.5-237 and 3.5-248, are revised as shown below:

Table 3.5.2-16 Reactor Building (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Below-grade exterior (inaccessible areas)	Flood Barrier Missile Barrier Shelter and Protection Structural Pressure Barrier Structural Support	Reinforced concrete	Groundwater/Soil	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A2.TP-212	3.5.1-065	A
				Cracking	Structures Monitoring (B.2.1.34)	III.A2.TP-204	3.5.1-043	A
				Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A2.TP-29	3.5.1-067	A
			Water - Flowing	Increase in Porosity and Permeability, Loss of Strength	Structures Monitoring (B.2.1.34)	III.A2.TP-67	3.5.1-047	A
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 3***

Table 3.5.2-16 Reactor Building (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

1. The Structures Monitoring (B.2.1.34) program is substituted to manage the applicable aging effect(s) for this component type, material, and environment combination.

2. Water level of spent fuel pool and leakage from the leak chase channels are monitored. Therefore, the One-Time Inspection (B.2.1.21) program is not required with the Water Chemistry (B.2.1.2) program for this component type.

3. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34) program.

SLRA Table 3.5.2-17, Recombiner Building, Summary of Aging Management Evaluation, pages 3.5-251 and 3.5-255, are revised as shown below:

Table 3.5.2-17 Recombiner Building (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Below-grade exterior (inaccessible areas)	Shelter and Protection Structural Support	Reinforced concrete	Water - Flowing	Increase in Porosity and Permeability, Loss of Strength	Structures Monitoring (B.2.1.34)	III.A3.TP-67	3.5.1-047	A
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 1***

Table 3.5.2-17 Recombiner Building (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

~~None.~~

1. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34).

SLRA Table 3.5.2-18, Stack, Summary of Aging Management Evaluation, pages 3.5-258 and 3.5-261, are revised as shown below:

Table 3.5.2-18 Stack (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Basemat, Foundation, Subfoundation (inaccessible areas)	Structural Support	Reinforced concrete	Groundwater/Soil	Cracking	Structures Monitoring (B.2.1.34)	III.A9.TP-204	3.5.1-043	A
				Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A9.TP-29	3.5.1-067	A
			Water - Flowing	Increase in Porosity and Permeability, Loss of Strength	Structures Monitoring (B.2.1.34)	III.A9.TP-67	3.5.1-047	A
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 1***

Table 3.5.2-18 Stack (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

~~None.~~

1. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34).

SLRA Table 3.5.2-19, Station Blackout Structure and Foundations, Summary of Aging Management Evaluation, pages 3.5-264 and 3.5-269, are revised as shown below:

Table 3.5.2-19 Station Blackout Structure and Foundations (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 3***
Concrete: Interior	Structural Support	Reinforced concrete	Air - Outdoor	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-26	3.5.1-066	A
				Cracking	Structures Monitoring (B.2.1.34)	III.A3.TP-25	3.5.1-054	A
				Loss of Material (Spalling, Scaling) and Cracking	Structures Monitoring (B.2.1.34)	III.A3.TP-23	3.5.1-064	A
			~~Water - Flowing~~	~~Increase in Porosity and Permeability, Loss of Strength~~	~~Structures Monitoring (B.2.1.34)~~	~~III.A3.TP-24~~	~~3.5.1-063~~	~~A~~

Table 3.5.2-19 Station Blackout Structure and Foundations (Continued)

Plant Specific Notes:

1. The FERC Inspections of the Conowingo Hydroelectric Plant (Dam) are the aging management program for the Conowingo Hydroelectric Plant (Dam). The Conowingo Hydroelectric Plant (Dam) is located on the Susquehanna River approximately ten miles above the mouth of the river on the Chesapeake Bay, five miles below the Pennsylvania border, and approximately ten miles south of PBAPS. Conowingo is owned and operated by Exelon Generation. Conowingo is part of the PBAPS SBO electrical system. Conowingo is licensed by the Federal Energy Regulatory Commission (FERC). Screening of Conowingo was performed at the plant (dam) level. Screening and aging management review of the plant (dam) were performed for the second period of extended operation based on current licensing basis established for Peach Bottom in NUREG-1769, Safety Evaluation Report Related to the License Renewal of Peach Bottom Atomic Power Station, Units 2 and 3, Section 3.6.3 "Station Blackout System". The staff concluded as stated in paragraph 3.6.3.2.1 "Aging Management Program", "By virtue of the FERC's authority and responsibility for ensuring that its regulated projects are constructed, operated, and maintained to protect life, health, and property, the staff finds that for earthen embankments, dams, appurtenances, and related structures subject to AMR, continued compliance with FERC requirements during the license renewal period will constitute an acceptable dam aging management program for the purposes of license renewal. Therefore, the staff finds the program acceptable." PBAPS will continue to comply with these FERC requirements during the second period of extended operation.

2. The FERC Inspections of the Conowingo Hydroelectric Plant (Dam) are substituted to manage aging effect(s) applicable to this component type, material, and environment combination.

3. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34) program.

SLRA Table 3.5.2-20, Turbine Building and Main Control Room Complex, Summary of Aging Management Evaluation, pages 3.5-272 and 3.5-276, are revised as shown below:

Table 3.5.2-20 Turbine Building and Main Control Room Complex (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 2***
Concrete: Interior (accessible areas)	HELB/MELB Shielding	Reinforced concrete	Air - Indoor Uncontrolled	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-26	3.5.1-066	A
				Cracking	Structures Monitoring (B.2.1.34)	III.A3.TP-25	3.5.1-054	A

Table 3.5.2-20 Turbine Building and Main Control Room Complex (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

1. The Structures Monitoring (B.2.1.34) program is substituted to manage the aging effects applicable to this component type, material, and environment combination, for the circulating water discharge tunnel.

2. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34) program.

SLRA Table 3.5.2-21, Watertight Dikes, Summary of Aging Management Evaluation, pages 3.5-277 and 3.5-278, are revised as shown below:

Table 3.5.2-21
Watertight Dikes
Summary of Aging Management Evaluation

Table 3.5.2-21 Watertight Dikes

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Below-grade exterior (inaccessible areas)	Structural Support	Reinforced concrete	Groundwater/Soil	Cracking and Distortion	Structures Monitoring (B.2.1.34)	III.A3.TP-30	3.5.1-044	A
				Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-212	3.5.1-065	A
				Cracking	Structures Monitoring (B.2.1.34)	III.A3.TP-204	3.5.1-043	A
				Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-29	3.5.1-067	A
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 1***

Table 3.5.2-21 Watertight Dikes (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

~~None.~~

1. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34) program.

SLRA Table 3.5.2-22, Yard Structures (Manholes, Duct Banks, Valve Pits, etc.), Summary of Aging Management Evaluation, pages 3.5-279, 3.5-280, 3.5-283, 3.5-284, and 3.5-285, are revised as shown below. This SLRA markup to Table 3.5.2-22 also includes the changes, discussed in Change #12 above to separately identify line items associated with Group 8 structures, and is duplicated here as an aid to the reviewer.

Table 3.5.2-22
Yard Structures (Manholes, Duct Banks, Valve Pits, etc.)
Summary of Aging Management Evaluation

Table 3.5.2-22 Yard Structures (Manholes, Duct Banks, Valve Pits, etc.)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Bolting (Structural-Storage Tanks)	***Structural Support***	***Galvanized Steel Bolting***	***Air - Outdoor***	***Loss of Material***	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-274***	***3.5.1-082***	***A***
				Loss of Preload	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-261***	***3.5.1-088***	***A***
Concrete elements: All (Foundation Condensate ***and Refueling Water*** Storage Tanks)	Structural Support	Reinforced concrete	Air - Outdoor	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-26	3.5.1-066	A
				Cracking	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-25	3.5.1-054	A
				Loss of Material (Spalling, Scaling) and Cracking	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-23	3.5.1-064	A
			Groundwater/Soil	Cracking and Distortion	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-30	3.5.1-044	A
				Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	***III.A8.TP-27***	***3.5.1-065***	***A***
						III.~~A3~~***A8***.TP-212	3.5.1-065	A
				Cracking	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-204	3.5.1-043	A
				Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-29	3.5.1-067	A
				Loss of Material (Spalling, Scaling) and Cracking	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-108***	***3.5.1-042***	***A***
			Water - Flowing	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-24***	***3.5.1-063***	***A, 1***
						III.A8.TP-67	***3.5.1-047***	***A, 1***

Table 3.5.2-22 Yard Structures (Manholes, Duct Banks, Valve Pits, etc.) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete elements: All (Foundation Diesel ***Fuel Oil*** Storage Tanks)	Structural Support	Reinforced concrete	Groundwater/Soil	Cracking and Distortion	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-30	3.5.1-044	A
				Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	***III.A8.TP-27***	***3.5.1-065***	***A***
						III.~~A3~~***A8***.TP-212	3.5.1-065	A
				Cracking	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-204	3.5.1-043	A
				Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.~~A3~~***A8***.TP-29	3.5.1-067	A
				Loss of Material (Spalling, Scaling) and Cracking	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-108***	***3.5.1-042***	***A***
			Water - Flowing	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-24***	***3.5.1-063***	***A, 1***
						III.A8.TP-67	***3.5.1-047***	***A, 1***
Concrete elements: Anchors	Structural Support	Carbon and Low Alloy Steel Bolting	Air - Outdoor	Loss of Material	Structures Monitoring (B.2.1.34)	III.A3.TP-274	3.5.1-082	A
				Loss of Preload	Structures Monitoring (B.2.1.34)	III.A3.TP-261	3.5.1-088	A
Concrete elements: Anchors (Storage Tanks)	***Structural Support***	***Carbon and Low Alloy Steel Bolting***	***Air - Outdoor***	***Loss of Material***	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-274***	***3.5.1-082***	***A***
				Loss of Preload	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-261***	***3.5.1-088***	***A***

Table 3.5.2-22 Yard Structures (Manholes, Duct Banks, Valve Pits, etc.) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Concrete: Exterior above- and below-grade; foundation (accessible areas)	***Structural Support***	***Reinforced concrete***	***Water - Flowing***	***Increase in Porosity and Permeability; Loss of Strength***	***Structures Monitoring (B.2.1.34)***	***III.A3.TP-24***	***3.5.1-063***	***A, 1***
Concrete: Interior (accessible areas)	Missile Barrier Shelter and Protection Structural Support	Reinforced concrete	Air - Indoor Uncontrolled	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-26	3.5.1-066	A
				Cracking	Structures Monitoring (B.2.1.34)	III.A3.TP-25	3.5.1-054	A
Concrete: Interior (inaccessible areas)	Missile Barrier Shelter and Protection Structural Support	Reinforced concrete	Air - Indoor Uncontrolled	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)	Structures Monitoring (B.2.1.34)	III.A3.TP-26	3.5.1-066	C
				Cracking	Structures Monitoring (B.2.1.34)	III.A3.TP-204	3.5.1-043	A
Equipment supports and foundations (Storage Tanks)	***Structural Support***	***Carbon Steel***	***Air - Outdoor***	***Loss of Material***	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-302***	***3.5.1-077***	***A***

Table 3.5.2-22 Yard Structures (Manholes, Duct Banks, Valve Pits, etc.) (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-2191 Item	NUREG-2192 Table 1 Item	Notes
Steel components: structural steel	Structural Support	Galvanized Steel	Air - Outdoor	Loss of Material	Structures Monitoring (B.2.1.34)	III.B2.TP-6	3.5.1-093	A
Steel components: structural steel (Storage Tanks)	***Structural Support***	***Galvanized Steel***	***Air - Outdoor***	***Loss of Material***	***Structures Monitoring (B.2.1.34)***	***III.A8.TP-302***	***3.5.1-077***	***A***

Table 3.5.2-22 Yard Structures (Manholes, Duct Banks, Valve Pits, etc.) (Continued)

Notes	Definition of Note
A	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
B	Consistent with NUREG-2191 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
C	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP is consistent with NUREG-2191 AMP.
D	Component is different, but consistent with NUREG-2191 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-2191 AMP.
E	Consistent with NUREG-2191 item for material, environment, and aging effect, but a different aging management program is credited or NUREG-2191 identifies a plant-specific aging management program.
F	Material not in NUREG-2191 for this component.
G	Environment not in NUREG-2191 for this component and material.
H	Aging effect not in NUREG-2191 for this component, material, and environment combination.
I	Aging effect in NUREG-2191 for this component, material, and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-2191.

Plant Specific Notes:

~~None.~~

1. The "water - flowing" environment has been added so that the aging effect and mechanism of "Increase in Porosity and Permeability, Loss of Strength/Leaching of Calcium Hydroxide and Carbonation" is addressed under the Structures Monitoring (B.2.1.34) program.

Change #16 – Revision to Fire Water System Enhancement #6

Affected SLRA Sections: Appendix A, Section A.2.1.17, Appendix A, Section A.5, Appendix B, Section B.2.1.17

SLRA Page Numbers: A-25, A-26, A-95, A-96 and B-103

Description of Change:

The Fire Water System aging management program (XI.M27), Enhancement #6 is being revised to eliminate extraneous information. The statement, "Follow-up volumetric wall thickness examinations will be performed if internal visual inspections detect age-related degradation in excess of what would be expected accounting for design, previous inspection experience, and inspection interval," is included in the SLRA Enhancement #6. The statement is being revised to align with GALL wording. The revised statement is, "Follow-up volumetric wall thickness examinations will be performed if internal visual inspections detect an unexpected level of degradation due to corrosion and corrosion product deposition."

Accordingly, SLRA Appendix A, Section A.2.1.17, Appendix A, Section A.5, and Appendix B, Section B.2.1.17 are revised.

SLRA Appendix A, Section A.2.1.17, Fire Water System, Enhancement #6, beginning on page A-25 is revised as shown below:

A.2.1.17 Fire Water System

6. Perform internal visual inspections of sprinkler and deluge system piping to identify internal corrosion, foreign material, and obstructions to flow. Follow-up volumetric wall thickness examinations will be performed if internal visual inspections detect ~~age-related degradation~~ ***an unexpected level of degradation due to corrosion and corrosion product deposition.*** ~~in excess of what would be expected accounting for design, previous inspection experience, and inspection interval.~~ If organic or foreign material, or internal flow blockage that could result in failure of system function is identified, then an obstruction investigation will be performed within the corrective action program that includes removal of the material, an extent of condition determination, review for increased inspections, extent of follow-up examinations, and a flush in accordance with NFPA 25 Annex D.5, Flushing Procedures. The internal visual inspections will consist of the following:

a. Wet pipe sprinkler systems - 50 percent of the wet pipe sprinkler systems in scope for license renewal will have visual internal inspections of piping by removing a hydraulically remote sprinkler, performed every five years, consistent with NFPA 25, 2011 Edition, Section 14.2. During the next five-year inspection period, the alternate systems previously not inspected shall be inspected.

b. Pre-action sprinkler systems - pre-action sprinkler systems in scope for license renewal will have visual internal inspections of piping by removing a hydraulically remote nozzle, performed every five years, consistent with NFPA 25, 2011 Edition, Section 14.2.

c. Deluge systems - Yard transformer deluge systems in scope for license renewal will have visual internal inspections of piping by removing a hydraulically remote nozzle, performed every five years, consistent with NFPA 25, 2011 Edition, Section 14.2.

SLRA Appendix B, Section B.2.1.17, Fire Water System, Enhancement #6, page B-103 is revised as shown below:

B.2.1.17 Fire Water System

6. Perform internal visual inspections of sprinkler and deluge system piping to identify internal corrosion, foreign material, and obstructions to flow. Follow-up volumetric wall thickness examinations will be performed if internal visual inspections detect ~~age-related degradation~~ ***an unexpected level of degradation due to corrosion and corrosion product deposition.*** ~~in excess of what would be expected accounting for design, previous inspection experience, and inspection interval.~~ If organic or foreign material, or internal flow blockage that could result in failure of system function is identified, then an obstruction investigation will be performed within the corrective action program that includes removal of the material, an extent of condition determination, review for increased inspections, extent of follow-up examinations, and a flush in accordance with NFPA 25 Annex D.5, Flushing Procedures. The internal visual inspections will consist of the following:

a. Wet pipe sprinkler systems - 50 percent of the wet pipe sprinkler systems in scope for license renewal will have visual internal inspections of piping by removing a hydraulically remote sprinkler, performed every five years, consistent with NFPA 25, 2011 Edition, Section 14.2. During the next five-year inspection period, the alternate systems previously not inspected shall be inspected.

b. Pre-action sprinkler systems - pre-action sprinkler systems in scope for license renewal will have visual internal inspections of piping by removing a hydraulically remote nozzle, performed every five years, consistent with NFPA 25, 2011 Edition, Section 14.2.

c. Deluge systems - Yard transformer deluge systems in scope for license renewal will have visual internal inspections of piping by removing a hydraulically remote nozzle, performed every five years, consistent with NFPA 25, 2011 Edition, Section 14.2.

SLRA Appendix A, Section A.5, Commitment 17, Fire Water System, Item #6, beginning on page A-95 is revised as shown below:

A.5 SECOND LICENSE RENEWAL COMMITMENT LIST

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE*	SOURCE
17	Fire Water System	6. Perform internal visual inspections of sprinkler and deluge system piping to identify internal corrosion, foreign material, and obstructions to flow. Follow-up volumetric wall thickness examinations will be performed if internal visual inspections detect ~~age-related degradation~~ ***an unexpected level of degradation due to corrosion and corrosion product deposition.*** ~~in excess of what would be expected accounting for design, previous inspection experience, and inspection interval.~~ If organic or foreign material, or internal flow blockage that could result in failure of system function is identified, then an obstruction investigation will be performed within the corrective action program that includes removal of the material, an extent of condition determination, review for increased inspections, extent of follow-up examinations, and a flush in accordance with NFPA 25 Appendix D.5, Flushing Procedures. The internal visual inspections will consist of the following: a. Wet pipe sprinkler systems - 50 percent of the wet pipe sprinkler systems in scope for license renewal will have visual internal inspections of piping by removing a hydraulically remote sprinkler, performed every five years, consistent with NFPA 25, 2011 Edition, Section 14.2. During the next five-year inspection period, the alternate systems previously not inspected shall be inspected. b. Pre-action sprinkler systems - pre-action sprinkler systems in scope for license renewal will have visual internal inspections of piping by removing a hydraulically remote nozzle, performed every five years, consistent with NFPA 25, 2011 Edition, Section 14.2. c. Deluge systems - Yard transformer deluge systems in scope for license renewal will have visual internal inspections of piping by removing a hydraulically remote nozzle, performed every five years, consistent with NFPA 25, 2011 Edition, Section 14.2.	Program will be enhanced no later than six months prior to the second period of extended operation. Inspections that are to be completed prior to the second period of extended operation will be completed no later than six months prior to the second period of extended operation, or no later than the last refueling outage prior to the second period of extended operation.	Section A.2.1.17 ***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

Change #17 – Removal of the Component-Specific Flaw Tolerance Evaluation Option from the Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS) Aging Management Program

Affected SLRA Sections: Appendix A, Section A.2.1.8 and Appendix B, Section B.2.1.8

SLRA Page Numbers: A-16, B-53

Description of Change:

The Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS) aging management program (XI.M12) is being revised to eliminate the component-specific flaw tolerance evaluation option as an aging management method.

The SLRA Appendix A, Section A.2.1.8 and Appendix B, Section B.2.1.8 contain the following statement, "Components with the potential for significant thermal aging embrittlement will be managed through either, qualified visual inspections, such as enhanced visual examination, qualified ultrasonic testing methodology, or component-specific flaw tolerance evaluation." The aging management option of "component-specific flaw tolerance evaluation" was deemed unnecessary and will be eliminated.

Accordingly, SLRA Appendix A, Section A.2.1.8 and Appendix B, Section B.2.1.8 are revised.

SLRA Appendix A, Section A.2.1.8, Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS), page A-16, second paragraph, is revised as shown below:

A.2.1.8 Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS)

The program will include a screening methodology to determine components for which thermal aging embrittlement is potentially significant based on casting method, molybdenum content, and percent ferrite. Components with the potential for significant thermal aging embrittlement will be managed through either, qualified visual inspections, such as enhanced visual examination, ***or*** qualified ultrasonic testing methodology~~., or component-specific flaw tolerance evaluation.~~ For pump casings, as an alternative to screening for significance of thermal aging embrittlement, no further actions are needed if a flaw tolerance evaluation performed as part of Code Case N-481 implementation is bounding for 80 years.

SLRA Appendix B, Section B.2.1.8, Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS), page B-53, second and fifth paragraphs, are revised as shown below:

B.2.1.8 Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS)

The program will include a screening methodology to determine components for which thermal aging embrittlement is potentially significant based on casting method, molybdenum content, and percent ferrite. Ferrite content is calculated by using the Hull's equivalent factors (described in NUREG/CR-4513, Revision 1). Components with the potential for significant thermal aging embrittlement will be managed through either, qualified visual inspections, such as enhanced visual examination, ***or*** qualified ultrasonic testing methodology~~, or component-specific flaw tolerance evaluation~~ in accordance with ASME Code, Section XI. For pump casings, as an alternative to screening for significance of thermal aging embrittlement, no further actions are needed if a flaw tolerance evaluation performed as part of Code Case N-481 implementation is bounding for 80 years.

Inspections or evaluations are not required for components for which thermal aging embrittlement is not significant. In addition, screening for ASME Code Class 1 CASS valve bodies for significance of thermal aging embrittlement is not required, because the existing ASME Section XI inspection requirements are adequate for managing the aging effects of Class 1 valve bodies.

Reactor vessel internal components fabricated from CASS are not within the scope of this aging management program and are managed by the BWR Vessel Internals (B.2.1.7) program.

The program will provide for either enhanced visual inspections, ***or*** qualified ultrasonic testing methodology~~, or flaw tolerance evaluations of susceptible components~~; it will not provide guidance on methods to mitigate thermal aging embrittlement. ~~The flaw tolerance evaluation will be based on specific geometry and stress information to verify that the thermally-embrittled material has adequate toughness throughout the second period of extended operation.~~

Thermal Aging Embrittlement of Cast Austenitic Stainless Steel program inspections, if required, will be based on ASME Code, Section XI, Table IWB-2412-1 and performed during each 10-year ISI interval. There are no ASME Class 2 components within this program, therefore, Table IWC-2412-1 does not apply. The PBAPS ASME Section XI program plans direct the inspection schedules and the extent of the inspections in the program planning documents as required to provide timely detection of flaws. Abnormal or unacceptable results identified are entered into the corrective action program for evaluation and resolution.

Flaws detected in reactor coolant pressure boundary ASME Code Class 1 CASS components are entered into the corrective action program and evaluated in accordance with the applicable procedures of ASME Code, Section XI. The ferrite content of the PBAPS Unit 2 and Unit 3 recirculation pump casings and covers are less than 20 percent therefore ASME Code, Section XI can be used for flaw evaluations. Repairs and replacements are performed in accordance with the ASME Section XI Code, which specify the requirements in IWA-4000, per the PBAPS ISI program.

Change #18 – Addition of Bolting Integrity Program Enhancements 8 and 9

Affected SLRA Sections: Appendix A, Section A.2.1.10, Appendix A, Section A.5 and Appendix B, Section B.2.1.10

SLRA Page Numbers: A-18, A-19, A-93, B-63, and B-66

Description of Change:

SLRA Appendix A.2.1.10, Bolting Integrity and Appendix B.2.1.10, Bolting Integrity state that PBAPS does not have high strength bolting material with actual yield strength of 150 ksi or greater (High Strength Bolting) on pressure-retaining components with bolt diameters greater than 2 inches. Therefore, sampling based volumetric examinations of high strength closure bolting greater than 2 inches in diameter is not applicable. In addition, existing procedures require engineering approval to use high strength bolting material on system components within the scope of license renewal.

However, Appendix A and B do not specify the necessary actions should PBAPS elect to install greater than 2 inches in diameter high strength closure bolting within the scope of license renewal. Enhancement 8 is added to clarify that engineering procedures will be enhanced to require volumetric examination in accordance with ASME Code Section XI, Table IWB-2500-1, Examination Category B-G-1, regardless of the code classification, should high strength bolting greater than 2 inches in diameter be installed.

In addition, the Preventative Action element for Bolting Integrity aging management program provides preventative actions to provide reasonable assurance that bolting integrity is maintained for high-strength bolting. No corresponding enhancements to this aging management program is provided in the SLRA to incorporate guidance of standards and emphasis of the recommended preventative actions. Enhancement 9 is added to reflect the use of guidance in the Preventative Action element relative to bolting integrity of high-strength bolts.

Accordingly, Enhancements 8 and 9 are added to SLRA Appendix A, Section A.2.1.10, Appendix A, Section A.5, and Appendix B, Section B.2.1.10.

SLRA Appendix A, Section A.2.1.10, Bolting Integrity, beginning on page A-17, is revised as shown below.

A.2.1.10 Bolting Integrity

The Bolting Integrity aging management program is an existing condition monitoring program. The program manages aging for loss of preload, cracking, and loss of material of safety-related and nonsafety-related closure bolting on pressure-retaining components. The program utilizes recommendations and guidelines delineated in NUREG-1339, EPRI NP-5769, TR-1015336, and TR-1015337 for material selection, use of approved lubricants, proper torqueing, and leakage evaluations which are implemented during plant surveillance and maintenance activities.

In addition, the program manages aging of submerged mechanical bolting on the 2AS008, 2BS008, 3AS008, and 3BS008 Circulating Water Pump Structure intake traveling screens.

The program includes periodic visual inspections of closure bolting on pressure-retaining components for indication of loss of preload, cracking, and loss of material as evidenced by pressure-retaining joint leakage. Closure bolting on pressure-retaining components and mechanical bolting that are submerged or closure bolting on pressure-retaining components located in piping systems that contain air or gas is inspected by alternative means, such as by sample based periodic inspections. The program also includes preventive measures provided in the EPRI guidance documents to preclude or minimize loss of preload and cracking. ***Engineering procedures will be enhanced to clarify that recommended guidance for selection, storage and installation of bolting per applicable EPRI and Research Council on Structural Connections (RCSC) publications are a requirement.***

There is no high strength bolting material with actual yield strength of 150 ksi or greater on pressure-retaining components with bolt diameters greater than 2 inches, or bolts with unknown yield strength within the scope of this program. Therefore, sampling based volumetric examinations of closure bolting to detect indications of cracking is not applicable. ***Engineering procedures will be enhanced to require volumetric examination in accordance with ASME Code Section XI, Table IWB-2500-1, Examination Category B-G-1, regardless of the code classification of the bolting, should high strength bolting greater than 2 inches in diameter be installed.***

The program performs periodic sample based inspections on submerged closure bolting on the ESW, HPSW, and fire protection pumps; submerged closure bolting on the Core Spray, HPCI, RHR, and RCIC suction strainers; and submerged mechanical bolts on the 2AS008, 2BS008, 3AS008, and 3BS008 Circulating Water Pump Structure intake traveling screens. The program also performs periodic inspections on submerged closure bolting on the emergency cooling water pump.

The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (A.2.1.1) program includes inspection of safety-related closure bolting on pressure-retaining components, and supplements this program. Inspection activities for bolting in a buried environment or underground with restricted access are performed in conjunction with buried piping and component inspections performed as part of the Buried and

Underground Piping and Tanks (A.2.1.28) program.

The Reactor Head Closure Stud Bolting (A.2.1.3) program manages the aging effects of the bolting components for the reactor vessel closure head. The ASME Section XI, Subsection IWE (A.2.1.30) program, ASME Section XI, Subsection IWF (A.2.1.31) program; Structures Monitoring (A.2.1.34) program; RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (A.2.1.35) program; Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (A.2.1.13) program; manage the aging effects of safety-related and nonsafety-related structural bolting. The External Surfaces Monitoring of Mechanical Components (A.2.1.24) program manages the aging effects of safety-related and nonsafety-related bolting associated with ductwork for heating, ventilation, and air conditioning systems.

The Bolting Integrity aging management program will be enhanced to:

1. Ensure that submerged carbon steel closure bolts on the ESW, HPSW, and fire protection pumps are inspected for loss of material and to confirm that the closure bolting is hand tight. A minimum of 19 bolt inspections shall be performed each 10-year period during the second period of extended operation for each unit. Inspection of closure boltlng on these pumps during pump overhaul and replacement activities may be credited during each 10-year period in the second period of extended operation.

2. Ensure that submerged stainless steel mechanical bolts on the 2AS008, 2BS008, 3AS008, and 3BS008 Circulating Water Pump Structure intake traveling screens are inspected for loss of material and to confirm that the mechanical bolting is hand tight. A minimum of 19 bolt inspections shall be performed each 10-year period during the second period of extended operation for each unit. Inspection of mechanical bolting on these screens during overhaul and replacement activities may be credited during each 10-year period in the second period of extended operation.

3. Ensure that closure bolts on pressure-retaining components that contain air or gas are inspected for cracking and loss of material for the carbon steel/ air-indoor uncontrolled and the stainless steel/ air-indoor uncontrolled material and environment combinations. In addition, the inspections will confirm that this closure bolting is leak tight applying inspection techniques, such as soap bubble testing, thermography, acoustic testing, or verifying closure bolting is hand tight. A minimum of 19 bolt inspections shall be performed each 10-year period during the second period of extended operation for each unit. Opportunistic inspections during maintenance activities may be credited during the same 10-year period.

4. Ensure that closure bolts on pressure-retaining components that contain air or gas are inspected for loss of material for the carbon steel/ air-outdoor material and environment combination. In addition, the inspections will confirm that this closure bolting is leak tight applying inspection techniques, such as soap bubble testing, thermography, acoustic testing, or verifying closure bolting is hand tight. A minimum of 25 bolt inspections shall be performed each 10-year period during the second period of extended operation for both Units 2 and 3. Opportunistic inspections during maintenance activities may be credited during the same 10-year period.

5. Revise site walkdown procedures to specify proper lighting and appropriate

distances to adequately identify visible component leakage, evidence of past leakage, or other age-related degradation on pressure–retaining bolted joints that contain fluids such as water, oil, or steam. Cameras and video equipment may be used to supplement these inspections.

6. Revise existing repetitive tasks to provide guidance for proper lighting and appropriate inspection distances to adequately identify loss of material in submerged environments. Cameras and video equipment may be used to supplement these inspections.

7. Ensure no fewer than five additional bolts are inspected for each sample based inspection that does not meet acceptance criteria, or 20 percent of the total bolt population of each applicable material, environment, and aging effect combination; whichever is less. If these subsequent inspections do not meet acceptance criteria, an extent of condition and extent of cause analysis are performed to determine the further extent of inspections. These additional inspections will be completed within the inspection interval for which the original sample based inspections are conducted.

8. Revise engineering procedures to require volumetric examination in accordance with ASME Code Section XI, Table IWB-2500-1, Examination Category B-G-1, regardless of the code classification of the bolting, should high strength bolting greater than 2 inches in diameter be installed.

9. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection to include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High Strength Bolts," are a requirement at Peach Bottom.

These enhancements will be implemented no later than six months prior to the second period of extended operation.

SLRA Appendix A, Section A.5, Second License Renewal Commitment List, Commitment 10, Bolting Integrity, beginning on page A-91, is revised as shown below.

10	Bolting Integrity	Bolting Integrity is an existing program that will be enhanced to: 1. Ensure that submerged carbon steel closure bolts on the ESW, HPSW, and fire protection pumps are inspected for loss of material and to confirm that the closure bolting is hand tight. A minimum of 19 bolt inspections shall be performed each 10-year period during the second period of extended operation for each unit. Inspection of closure bolting on these pumps during pump overhaul and replacement activities may be credited during each 10-year period in the second period of extended operation. 2. Ensure that submerged stainless steel mechanical bolts on the 2AS008, 2BS008, 3AS008, and 3BS008 Circulating Water Pump Structure intake traveling screens are inspected for loss of material and to confirm that the mechanical bolting is hand tight. A minimum of 19 bolt inspections shall be performed each 10-year period during the second period of extended operation for each unit. Inspection of mechanical bolting on these screens during overhaul and replacement activities may be credited during each 10-year period in the second period of extended operation. 3. Ensure that closure bolts on pressure-retaining components that contain air or gas are inspected for cracking and loss of material for the carbon steel/ air-indoor uncontrolled and the stainless steel/ air-indoor uncontrolled material and environment combinations. In addition, the inspections will confirm that this closure bolting is leak tight applying inspection techniques, such as soap bubble testing, thermography, acoustic testing, or verifying closure bolting is hand tight. A minimum of 19 bolt inspections shall be performed each 10-year period during the second period of extended operation for each unit. Opportunistic inspections during maintenance activities may be credited during the same 10-year period. 4. Ensure that closure bolts on pressure-retaining components that contain air or gas are inspected for loss of material for the carbon steel/ air-outdoor material and environment combination. In addition, the inspections will confirm that this closure bolting is leak tight applying inspection techniques, such as soap bubble testing, thermography, acoustic testing, or verifying closure bolting is hand tight. A minimum of 25 bolt inspections shall be performed each 10-year period during the second period of extended operation for both Units 2 and 3. Opportunistic	Program will be enhanced no later than six months prior to the second period of extended operation	Section A.2.1.10

		inspections during maintenance activities may be credited during the same 10-year period. 5. Revise site walkdown procedures to specify proper lighting and appropriate distances to adequately identify visible component leakage, evidence of past leakage, or other age-related degradation on pressure-retaining bolted joints that contain fluids such as water, oil, or steam. Cameras and video equipment may be used to supplement these inspections. 6. Revise existing repetitive tasks to provide guidance for proper lighting and appropriate inspection distances to adequately identify loss of material in submerged environments. Cameras and video equipment may be used to supplement these inspections. 7. Ensure no fewer than five additional bolts are inspected for each sample based inspection that does not meet acceptance criteria, or 20 percent of the total bolt population of each applicable material, environment, and aging effect combination; whichever is less. If these subsequent inspections do not meet acceptance criteria, an extent of condition and extent of cause analysis are performed to determine the further extent of inspections. These additional inspections will be completed within the inspection interval for which the original sample based inspections are conducted. ***8. Revise engineering procedures to require volumetric examination in accordance with ASME Code Section XI, Table IWB-2500-1, Examination Category B-G-1, regardless of the code classification of the bolting, should high strength bolting greater than 2 inches in diameter be installed.*** ***9. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection to include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High Strength Bolts," are a requirement at Peach Bottom.***		***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

SLRA Appendix B, Section B.2.1.10, Bolting Integrity, beginning on page B-62, is revised as shown below.

B.2.1.10 Bolting Integrity

Program Description

The Bolting Integrity aging management program is an existing condition monitoring program which manages aging for loss of preload, cracking, and loss of material of safety-related and nonsafety-related closure bolting on pressure-retaining components. The program utilizes recommendations and guidelines delineated in NUREG-1339, EPRI NP-5769, TR-1015336, and TR-1015337 for material selection, use of approved lubricants, proper torqueing, and leakage evaluations which are implemented during plant surveillance and maintenance activities.

In addition, the program manages aging of submerged mechanical bolting on the 2AS008, 2BS008, 3AS008, and 3BS008 Circulating Water Pump Structure intake traveling screens.

The program activities provide for aging management of closure bolting on pressure-retaining components within the scope of second license renewal. The program includes periodic inspection, at least once per refueling cycle, of closure bolting on pressure-retaining components for indication of loss of preload, cracking, and loss of material due to corrosion. The program also credits visual inspection of pressure-retaining bolted joints in ASME Class 1, 2, and 3 systems for leakage and age-related degradation during system pressure tests performed in accordance with ASME Section XI. In addition, the Bolting Integrity aging management program credits volumetric, surface, and visual inspections of ASME Section XI Class 1, 2, and 3 bolts, nuts, washers, and other associated bolting components performed in accordance with ASME Section XI, Tables IWB-2500-1, IWC-2500-1, and IWD-2500-1. The integrity of ASME and non-ASME pressure-retaining bolted joints which contain fluids such as water, oil, or steam is assessed by detection of visible leakage, evidence of past leakage, or other age-related degradation during walkdowns and maintenance activities. Conditions such as: degraded bolts, nuts and threads; active leakage; high noise levels; loose or missing bolts and nuts; evidence of past leakage; damaged insulation; discoloration; or other age-related degradation are entered into the corrective action program where the condition is evaluated. Resulting actions could include: operability evaluation, root cause determination, extent of condition evaluation, additional or more frequent inspections, and replacement. This could include, when practical, projections of identified corrosion or degradation rates until the next scheduled inspection or replacement. Inspections are performed by personnel qualified in accordance with station procedures and programs to perform the specified task. Inspections within the scope of the ASME Code follow procedures consistent with the ASME Code. Non-ASME Code inspections follow station procedures that include inspection parameters for items such as lighting, distance, and offset, which provide an adequate examination.

The program performs periodic sample inspections on closure bolting on pressure-retaining components within the scope of second license renewal that contain air or gas.

The program also includes preventive measures, such as, use of EPRI guidance for the installation, makeup, and material selections of bolted joints; prohibiting the use of lubricants containing molybdenum disulfide; and minimizing the use of high strength bolting to preclude or minimize loss of preload and cracking. ***Engineering procedures will be enhanced to clarify that recommended guidance for selection, storage and installation of bolting per applicable EPRI and Research Council on Structural Connections (RCSC) publications are a requirement.***

Aging management reviews have determined that high strength bolting material with actual yield strength of 150 ksi or greater is used for closure bolting on pressure-retaining components within the scope of second license renewal. There are no high strength bolts that are greater than 2 inches in diameter, or bolts with unknown yield strength within the scope of the Bolting Integrity program, therefore sample based volumetric inspection of closure bolting to detect indications of cracking is not applicable. ***Engineering procedures will be enhanced to require volumetric examination in accordance with ASME Code Section XI, Table IWB-2500-1, Examination Category B-G-1, regardless of the code classification of the bolting, should high strength bolting greater than 2 inches in diameter be installed.***

The program includes periodic sample inspections on submerged closure bolting on the ESW, HPSW, and fire protection pumps; submerged closure bolting on the Core Spray, HPCI, RHR, and RCIC system suction strainers; and submerged mechanical bolts on the 2AS008, 2BS008, 3AS008, and 3BS008 intake traveling screens. The program also performs periodic inspections on submerged closure bolting on the emergency cooling water pump.

The reduction of the number of minimum inspections to 19 from 25 bolts per unit for the ESW, HPSW and fire protection pumps, and mechanical bolting located on the 2AS008, 2BS008, 3AS008, and 3BS008 intake traveling screens is justified since the raw water environment in each intake bay is the same for Unit 2 and Unit 3. Also, the reduction of the number of minimum inspections to 19 from 25 bolts per unit on pressure-retaining components that contain air or gas in the carbon steel/ air-indoor uncontrolled and the stainless steel/ air-indoor uncontrolled material and environment combinations is justified since the air-indoor uncontrolled environment for Unit 2 and 3 is the same.

For sample based inspections in which acceptance criteria is not met the condition will be entered into the corrective action program. Conditions such as: loss of material; cracking; loss pf preload; degraded threads; active leakage; loose or missing bolts or nuts; and evidence of past leakage will be entered into the corrective action program where the condition will be evaluated. The degraded conditions will be evaluated relative to extent of condition against the total population of bolts under similar service conditions, to confirm the timing and extent of subsequent inspections to maintain the components' intended functions throughout the second period of extended operation. Site procedures will be enhanced so that as a minimum, additional inspection will be conducted where there will be no fewer than five additional inspections for each inspection that did not meet acceptance criteria, or 20 percent of each applicable material, environment, and aging effect combination, whichever is less. The additional inspections will be completed within the inspection interval for which the original sample based inspections are conducted. Inspection frequencies may be adjusted based on projected degradation rates.

The following bolting is not managed by in the Bolting Integrity aging management program.

- The bolting components for the reactor vessel closure head are managed by the Reactor Head Closure Stud Bolting (B.2.1.3) program.
- The Primary Containment (MC) pressure-retaining bolting is managed as part of the ASME Section XI, Subsection IWE (B.2.1.30) program.
- ASME Class 1, 2, 3, and MC piping and components support bolting, including NSSS component supports, is managed as part of the ASME Section XI, Subsection IWF (B.2.1.31) program.
- Structural bolting, other than ASME Class 1, 2, 3, and MC piping and component supports bolting is managed as part of the Structures Monitoring (B.2.1.34) program, and the Inspection of Water-Control Structures Associated With Nuclear Power Plants (B.2.1.35) program.
- Crane and hoist bolting is managed by the Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.13) program.
- Heating and ventilation system bolted joints are managed by the External Surfaces Monitoring of Mechanical Components (B.2.1.24) program.
- Pressure-retaining bolting in a buried environment or underground with restricted access are inspected in conjunction with buried piping and component inspections performed as part of the Buried and Underground Piping and Tanks (B.2.1.28) program.

NUREG-2191 Consistency

The Bolting Integrity aging management program will be consistent with the ten elements of aging management program XI.M18, "Bolting Integrity" specified in NUREG-2191 with the following exception.

Exceptions to NUREG-2191

1. NUREG-2191 recommends that the scope of the Bolting Integrity program manages aging of closure bolting on pressure-retaining components. The scope of the Bolting Integrity aging management program will also include the aging management of mechanical bolting on the 2AS008, 2BS008, 3AS008, and 3BS008 Circulating Water Pump Structure intake traveling screens. **Program Element Affected: Scope of Program (Element 1)**

Justification for Exception

Although the submerged mechanical bolts on the 2AS008, 2BS008, 3AS008, and 3BS008 Circulating Water Pump Structure intake traveling screens are not closure bolting on pressure-retaining components, the Bolting Integrity aging management program has been determined to address the aging effects of loss of preload and loss of material as recommended in NUREG-2191.

The component, material, environment, and aging effects for these submerged mechanical bolts are the same as for submerged pressure-retaining closure bolts that are included within the scope of the NUREG-2191, XI.M18, Bolting Integrity program. The alternate means of inspection or testing provided within the NUREG-2191, XI.M18 program for submerged bolting, utilizing sample based visual inspections, has been determined to adequately manage the aging effects of loss of preload and loss of material for these submerged mechanical bolts.

Enhancements

Prior to the second period of extended operation, the following enhancements will be implemented in the following program elements:

1. Ensure that submerged carbon steel closure bolts on the ESW, HPSW, and fire protection pumps are inspected for loss of material and to confirm that the closure bolting is hand tight. A minimum of 19 bolt inspections shall be performed each 10-year period during the second period of extended operation for each unit. Inspection of closure bolting on these pumps during pump overhaul and replacement activities may be credited during each 10-year period in the second period of extended operation. **Program Elements Affected: Detection of Aging Effects (Element 4) and Acceptance Criteria (Element 6).**

2. Ensure that submerged stainless steel mechanical bolts on the 2AS008, 2BS008, 3AS008, and 3BS008 Circulating Water Pump Structure intake traveling screens are inspected for loss of material and to confirm that the mechanical bolting is hand tight. A minimum of 19 bolt inspections shall be performed each 10-year period during the second period of extended operation for each unit. Inspection of mechanical bolting on these screens during overhaul and replacement activities may be credited during each 10-year period in the second period of extended operation. **Program Elements Affected: Detection of Aging Effects (Element 4) and Acceptance Criteria (Element 6).**

3. Ensure that closure bolts on pressure-retaining components that contain air or gas are inspected for cracking and loss of material for the carbon steel/ air-indoor uncontrolled and the stainless steel/ air-indoor uncontrolled material and environment combinations. In addition, the inspections will confirm that this closure bolting is leak tight applying inspection techniques, such as soap bubble testing, thermography, acoustic testing, or verifying closure bolting is hand tight. A minimum of 19 bolt inspections shall be performed each 10-year period during the second period of extended operation for each unit. Opportunistic inspections during maintenance activities may be credited during the same 10-year period. **Program Elements Affected: Detection of Aging Effects (Element 4) and Acceptance Criteria (Element 6).**

4. Ensure that closure bolts on pressure-retaining components that contain air or gas are inspected for loss of material for the carbon steel/ air-outdoor material and environment combination. In addition, the inspections will confirm that this closure bolting is leak tight applying inspection techniques, such as soap bubble testing, thermography, acoustic testing, or verifying closure bolting is hand tight. A minimum of 25 bolt inspections shall be performed each 10-year period during the second period of extended operation for both Units 2 and 3. Opportunistic inspections during maintenance activities may be credited during the same 10-year period. **Program Elements Affected: Detection of Aging Effects (Element 4) and Acceptance Criteria (Element 6).**

5. Revise site walkdown procedures to specify proper lighting and appropriate distances to adequately identify visible component leakage, evidence of past leakage, or other age-related degradation on pressure–retaining bolted joints that contain fluids such as water, oil, or steam. Cameras and video equipment may be used to supplement these inspections. **Program Element Affected: Detection of Aging Effects (Element 4).**

6. Revise existing repetitive tasks to provide guidance for the proper lighting and appropriate inspection distances to adequately identify loss of material for bolting in submerged environments. Cameras and video equipment may be used to supplement these inspections. **Program Element Affected: Detection of Aging Effects (Element 4).**

7. Ensure no fewer than five additional bolts are inspected for each sample based inspection that does not meet acceptance criteria, or 20 percent of the total bolt population of each applicable material, environment, and aging effect combination; whichever is less. If these subsequent inspections do not meet acceptance criteria, an extent of condition and extent of cause analysis are performed to determine the further extent of inspections. These additional inspections will be completed within the inspection interval for which the original sample based inspections are conducted. **Program Element Affected: Corrective Actions (Element 7)**

8. Revise engineering procedures to require volumetric examination in accordance with ASME Code Section XI, Table IWB-2500-1, Examination Category B-G-1, regardless of the code classification of the bolting, should high strength bolting greater than 2 inches in diameter be installed. Program Element Affected: Detection of Aging Effects (Element 4).

9. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection to include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High Strength Bolts," are a requirement at Peach Bottom. Program Element Affected: Preventive Actions (Element 2).

Change #19 – Addition of Enhancement for Detection of Aging Effects for One-Time Supplemental Volumetric Examination, if Triggered by Plant-Specific OE, of the Containment Metal Shell

Affected SLRA Sections: Appendix A, Section A.2.1.30, Appendix A, Section A.5, and Appendix B, Section B.2.1.30

SLRA Page Numbers: A-40, A-106, and B-174

Description of Change:

The Detection of Aging Effects element for ASME Section XI, Subsection IWE aging management program states that if triggered by plant-specific operating experience, a one-time supplemental volumetric examination is required of the containment shell inaccessible surfaces. No corresponding enhancements to the ASME Section XI, Subsection IWE aging management program is provided in the SLRA to incorporate the required examination. A new enhancement is being created to reflect the requirement in the Detection of Aging Effects element including the guidance on the trigger for examination, sample size, location, and any required scope expansion.

Accordingly, SLRA Appendix A, Section A.2.1.30, Appendix A, Section A.5, and Appendix B, Section B.2.1.30 are revised.

SLRA Appendix A, Section A.2.1.30, ASME Section XI, Subsection IWE, page A-40, is revised as shown below to provide an enhancement for implementation of a one-time supplemental volumetric examination, if triggered by plant-specific OE, of the containment metal shell. This SLRA markup also includes the changes discussed in Change #6 above to address preventative actions for bolting integrity and is duplicated here as an aid to the reviewer.

A.2.1.30 ASME Section XI, Subsection IWE

The ASME Section XI, Subsection IWE aging management program is an existing condition monitoring program based on ASME Code and complies with the provisions of 10 CFR 50.55a. The program consists of periodic visual, surface, and volumetric examinations, where applicable, of metallic pressure-retaining components of steel containments for signs of degradation, damage, irregularities, and for coated areas distress of the underlying metal shell, and corrective actions. Acceptability of inaccessible areas of steel containment shell is evaluated when conditions found in accessible areas indicate the presence of, or could result in, flaws or degradation in inaccessible areas.

This program also includes aging management for the potential loss of material due to corrosion in the inaccessible areas of the BWR Mark I steel containment. In addition, the program includes supplemental surface examination to detect cracking for high temperature mechanical penetrations subject to cyclic loading but have no CLB fatigue analysis; and if triggered by plant-specific operating experience, a one-time supplemental volumetric examination by sampling randomly selected as well as focused locations susceptible to loss of thickness due to corrosion of containment shell that is inaccessible from one side. Inspection results are compared with prior recorded results in acceptance of components for continued service.

The ASME Section XI, Subsection IWE aging management program will be enhanced to:

1. Perform surface examinations on accessible portions of high temperature drywell mechanical penetrations, in addition to visual examinations, to detect cracking, once per 10-year interval during the second period of extended operation.

2. ***Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.***

3. ***Implement a one-time supplemental volumetric examination of the containment metal shell surfaces that are inaccessible from one side, if triggered by plant-specific OE. The trigger for this supplemental examination is plant-specific occurrence or recurrence of measurable metal shell corrosion (base metal material loss exceeding 10 percent of nominal plate thickness) initiated on the inaccessible side or areas, identified since the date of issuance of the first renewed license. This supplemental volumetric examination consists of a sample of one-foot square locations that include both randomly-selected and focused areas most likely to experience degradation***

based on plant-specific OE and/or other relevant considerations such as environment. The sample size, locations, and any needed scope expansion (based on findings) for this one-time set of volumetric examinations should be determined on a plant-specific basis to demonstrate statistically with 95 percent confidence that 95 percent of the accessible portion of the containment liner is not experiencing corrosion degradation with greater than 10 percent loss of nominal thickness.

~~This enhancement~~ ***These enhancements*** will be implemented no later than six months prior to the second period of extended operation.

SLRA Appendix A, Section A.5, Commitment 30, on page A-106, is revised as shown below to provide an enhancement for implementation of a one-time supplemental volumetric examination, if triggered by plant-specific OE, of the containment metal shell. This SLRA markup also includes the changes discussed in Change #6 above to address preventative actions for bolting integrity and is duplicated here as an aid to the reviewer.

A.5 Second License Renewal Commitment List

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE*	SOURCE
30	ASME Section XI, Subsection IWE	ASME Section XI, Subsection IWE is an existing program that will be enhanced to: 1. Perform surface examinations on accessible portions of high temperature drywell mechanical penetrations, in addition to visual examinations, to detect cracking, once per 10-year interval during the second period of extended operation. ***2. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.*** ***3. Implement a one-time supplemental volumetric examination of the containment metal shell surfaces that are inaccessible from one side, if triggered by plant-specific OE. The trigger for this supplemental examination is plant-specific occurrence or recurrence of measurable metal shell corrosion (base metal material loss exceeding 10 percent of nominal plate thickness) initiated on the inaccessible side or areas, identified since the date of issuance of the first renewed license. This supplemental volumetric examination consists of a sample of one-foot square locations that include both randomly-selected and focused areas most likely to experience degradation based on plant-specific OE and/or other relevant considerations such as environment. The sample size, locations, and any needed scope expansion (based on findings) for this one-time set of volumetric examinations should be determined on a plant-specific basis to demonstrate statistically with 95 percent confidence that 95 percent of the accessible portion of the containment liner is not experiencing corrosion degradation with greater than 10 percent loss of nominal thickness.***	Program will be enhanced no later than six months prior to the second period of extended operation.	Section A.2.1.30 ***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

SLRA Appendix B, Section B.2.1.30, ASME Section XI, Subsection IWE, page B-174, is revised as shown below to provide an enhancement for implementation of a one-time supplemental volumetric examination, if triggered by plant-specific OE, of the containment metal shell. This SLRA markup also includes the changes discussed in Change #6 above to address preventative actions for bolting integrity and is duplicated here as an aid to the reviewer.

B.2.1.30 ASME Section XI, Subsection IWE

Enhancements

Prior to the second period of extended operation, the following ~~enhancement~~ ***enhancements*** will be implemented in the following program elements:

1. Perform surface examinations on accessible portions of high temperature drywell mechanical penetrations, in addition to visual examinations, to detect cracking, once per 10-year interval during the second period of extended operation. **Program Elements Affected: Parameters Monitored or Inspected (Element 3) and Detection of Aging Effects (Element 4)**

2. ***Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom. Program Elements Affected: Preventative Action (Element 2)***

3. ***Implement a one-time supplemental volumetric examination of the containment metal shell surfaces that are inaccessible from one side, if triggered by plant-specific OE. The trigger for this supplemental examination is plant-specific occurrence or recurrence of measurable metal shell corrosion (base metal material loss exceeding 10 percent of nominal plate thickness) initiated on the inaccessible side or areas, identified since the date of issuance of the first renewed license. This supplemental volumetric examination consists of a sample of one-foot square locations that include both randomly-selected and focused areas most likely to experience degradation based on plant-specific OE and/or other relevant considerations such as environment. The sample size, locations, and any needed scope expansion (based on findings) for this one-time set of volumetric examinations should be determined on a plant-specific basis to demonstrate statistically with 95 percent confidence that 95 percent of the accessible portion of the containment liner is not experiencing corrosion degradation with greater than 10 percent loss of nominal thickness. Program Elements Affected: Detection of Aging Effects (Element 4)***

Change #20 – Addition of Summary of Fatigue Waiver Assessment

Affected SLRA Sections: 3.5.2.2.1.5 and 3.5.2.2.1.6

SLRA Page Numbers: 3.5-33, 3.5-34, and 3.5-35

Description of Change:

SLRA Appendix B, Section B.2.1.30 ASME XI, Subsection IWE includes the following exception: "NUREG-2191 states that steel, stainless steel, dissimilar metal weld pressure-retaining components that are subject to cyclic loading but have no CLB fatigue analysis, are monitored for cracking and are supplemented with surface examination (or other applicable techniques) in addition to visual examination to detect cracking. Peach Bottom does not monitor for cracking utilizing supplemental surface examinations except at high temperature mechanical penetrations."

As part of the justification for the exception, the SLRA states that the PBAPS primary containment was designed per ASME Section III, 1965 edition and applicable addenda through the Summer 1966 edition, and that no fatigue analysis or waiver was required per the original construction specifications. The SLRA Section 3.5.2.2.1.6 further states that PBAPS has performed an assessment that has shown that had the drywell been designed to ASME Section III, 1974 edition, it would have met the six criteria in Subsection NE-3222.4(d) "Components not requiring analysis for cyclic operation." This drywell fatigue waiver assessment concluded that the components that could be subject to cyclic loading, but have no CLB fatigue analysis, are subject to an acceptable and negligible amount of fatigue, and therefore no visual or surface examinations will be performed on these components. SLRA Section 3.5.2.2.1.5 is being revised to provide a summary of the fatigue waiver to provide additional detail on the actual assessment.

Accordingly, SLRA Sections 3.5.2.2.1.5 and 3.5.2.2.1.6 are being revised to include the additional detail.

SLRA Section 3.5.2.2.1.5, page 3.5-33 is revised as shown below.

3.5.2.2.1.5 Cumulative Fatigue Damage

Evaluations involving time-dependent fatigue, cyclical loading, or cyclical displacement of metal liner, metal plates, suppression pool steel shells (including welded joints) and penetrations (including personnel airlock, equipment hatch, control rod drive (CRD) hatch, penetration sleeves, dissimilar metal welds, and penetration bellows) for all types of PWR and BWR containments and BWR vent header, vent line bellows, and downcomers may be TLAAs as defined in 10 CFR 54.3. TLAAs are required to be evaluated in accordance with 10 CFR 54.21(c)(1). The evaluation of this TLAA is addressed in Section 4.6, "Containment Liner Plates, Metal Containments, and Penetrations Fatigue Analysis," and for cases of plant-specific components, in Section 4.7 "Other Plant-Specific Time-Limited Aging Analyses," of this SRP-SLR. For plant-specific cumulative usage factor calculations, the method used is appropriately defined and discussed in the applicable TLAAs.

Table 3.5.1 Item Number 3.5.1-009: This item evaluates cumulative fatigue damage due to cyclic loading (only for an existing analysis that is part of the CLB) in metal plates, suppression pool steel shells (including welded joints) and penetrations (including personnel airlock, equipment hatch, CRD hatch, penetration sleeves, dissimilar metal welds, and penetration bellows), vent header, vent line bellows, and downcomers of the PBAPS Mark I containment exposed to air-indoor and treated water environments. Components of the primary containment that were analyzed for fatigue and evaluated as a TLAA include the PBAPS torus, torus penetrations, vent header and downcomers, drywell to torus vents, safety relief valve discharge piping externally attached to the torus, other piping attached to the torus, drywell to torus vent bellows, and RHR and Core Spray suction strainers. These components are addressed in Section 4.6.1. In addition, the evaluation of fatigue as a TLAA, for the containment process line penetration bellows, is addressed in Section 4.6.2 and the evaluation of fatigue as a TLAA, for the Unit 3 RHR supply and return line penetrations, is addressed in Section 4.3.2.

The PBAPS Unit 2 and Unit 3 drywell structures, penetrations, and associated components were determined not to have an existing fatigue analysis and therefore have no fatigue TLAAs. These drywell components include the drywell shell, drywell head, drywell personnel airlock, drywell equipment hatches, drywell CRD removal hatch, drywell electrical penetrations, and drywell mechanical penetrations except for bellows and the Unit 3 RHR supply and return line penetrations. The containment analysis was completed in accordance with the original design specifications. Fatigue analysis, or a fatigue waiver, for the drywell shell, drywell head, or drywell penetrations was not required since no cyclical loads were identified for these components in the applicable design specifications per the CLB. ***As part of license renewal activities, a fatigue waiver analysis was performed that has shown that had the drywell been designed to ASME Section III, 1974 edition, it would have met the six criteria in Subsection NE-3222.4(d) "Components not requiring analysis for cyclic operation." This drywell fatigue waiver assessment concluded that the components that could be subject to cyclic loading, but have no CLB fatigue analysis, are subject to an acceptable and negligible amount of fatigue. The fatigue waiver assessment is summarized at the end of this section.***

Subsequent to the original design, design changes were made to some portions of the containment, which added new requirements for fatigue analyses, which are considered TLAAs, as described below.

During the 1980's, elements of the PBAPS Units 2 and 3 primary containments were reanalyzed in response to discoveries, by General Electric and others, of unevaluated loads due to design basis events and safety relief valve (SRV) discharge. The load definitions include assumed pressure and temperature transient cycles resulting from SRV discharge and design basis loss of coolant accident (LOCA) events. Components of the primary containment that were analyzed

included the torus shell, torus penetrations, the drywell-to-torus vent piping, SRV discharge piping, other piping attached to the torus, and the drywell to torus vent bellows. As such, these components were analyzed for fatigue and are considered TLAAs, which are addressed in Section 4.6.1.

In the 1980s the PBAPS replaced reactor recirculation and the residual heat removal (RHR) system piping on both units. The Unit 3, the drywell flued-head penetrations for the RHR system were also replaced and analyzed for fatigue in accordance with ASME Section III, Class 1 requirements. These components were analyzed for fatigue and these analyses are considered TLAAs, which are addressed in Section 4.3.2.

In 1997 and 1998 PBAPS Units 2 and 3 replaced the RHR and Core Spray System suction strainers. These new strainers and their supports were designed to ASME Section III, Subsections NC, NE, and NF, 1980 edition up to and including Winter 1981 Addenda. As such, the new strainers and supports were analyzed for fatigue, and these analyses are considered TLAAs, which are addressed in Section 4.6.1.

Drywell Fatigue Waiver Assessment

1. Introduction

1.1 For drywell components that do not have a fatigue analysis performed per the original plant design specifications and construction codes, PBAPS has performed an assessment to show that the drywell would have met the criteria for a fatigue waiver.

2. Summary

2.1 The PBAPS Unit 2 and Unit 3 drywell structures, penetrations, and associated components were determined not to have an existing fatigue analysis and therefore have no fatigue TLAAs. These drywell components include the drywell shell, drywell head, drywell personnel airlock, drywell equipment hatches, drywell CRD removal hatch, drywell electrical penetrations, and drywell mechanical penetrations. The containment analysis was completed in accordance with the original design specifications. Fatigue analysis, or a fatigue waiver, for the drywell shell, drywell head, and drywell penetrations as listed above were not required since no cyclical loads were identified for these components in the applicable design specifications per the CLB.

The PBAPS primary containment was designed per ASME Section III, 1965 edition through Summer 1966 addenda. There was no fatigue analysis or waiver required per original construction specifications. Nevertheless, as part of the development of the SLRA, PBAPS has performed an assessment that has shown that had the drywell been designed to ASME Section III, 1974 edition, it would have met the six criteria in Subsection NE-3222.4(d) "Vessels Not Requiring Analysis for Cyclic Operation." The design values used in the assessment were based on 1974 Code edition. These values were compared to those values in the 1965 edition/1966 addenda code of record and no changes were noted which impacted the conclusions of the fatigue waiver. Therefore, the fatigue waiver assessment (using 1974 code) applies to drywell design based on 1965-66 code of record.

The assessment justified that the drywell structures, penetrations, and associated components meet the fatigue waiver criteria specified in ASME Section III, Subparagraph NE-3222.4(d) and that no fatigue analysis was required to be performed

for the drywell structures, penetrations, and associated components. The six criteria address the following design inputs:

1. *Atmospheric-to-Operating Pressure Cycles*
2. *Normal Operation Pressure Fluctuations*
3. *Temperature Difference – Startup and Shutdown*
4. *Temperature Difference – Normal Operation*
5. *Temperature Difference – Dissimilar Materials*
6. *Mechanical Loads*

2.2 *This assessment excluded any portions of penetrations that are affected by process fluid to the extent that either (a) temperature exceeds the maximum drywell temperature of 281°F, and/or (b) has a range in temperature difference between adjacent points greater than 231°F.*

Due to the scope restrictions on maximum temperature and maximum temperature difference, portions of the following penetrations are excluded by the fatigue waiver assessment and as a result, accessible portions of these penetrations will have surface examinations performed to detect cracking:

- *N-7 A-D: main steam*
- *N-8: condensate drain, main steam*
- *N-9 A/B: RPV feedwater*
- *N-10: RCIC steam supply*
- *N-11: HPCI steam supply*
- *N-12: RHR supply, Unit 2 only*
- *N-13 A/B: RHR return, Unit 2 only*
- *N-14: reactor water cleanup pump supply*
- *N-41: recirc sample*
- *N-57: main steam sample*

2.3 *Portions of these penetrations, remote from the process piping, such as bellows and outer sleeve, are expected to be below 281 degrees F and within the range in temperature difference between adjacent points of 231°F and are therefore included by the assessment. For Unit 3, the penetrations N-12 and N-13 A/B were analyzed for fatigue and are therefore not included within the scope of this assessment.*

2.4 *The materials used in the drywell and its penetrations are ASME SA-516 Grade 70 (plate) and ASME SA-333 Grade 1 (pipe), both of which are carbon steel. In addition, some penetrations contain stainless steel portions. The material properties for ASME SA-240 Type 304L stainless steel material are used since these include the bounding (low) Sm values. The assessment is simplified to perform an evaluation of the six criteria on a material basis instead of an individual penetration basis.*

2.5 Conservative, bounding number of cycles for 80 years were used with specific values as follows, with further explanations provided in subsequent sections:

- *Number of full pressure cycles: 266 (per SLRA Table 4.3.3-2)*
- *Number of significant pressure fluctuations: 17 (bounds number of integrated leak rate tests based on original 10-year integrated leak rate test requirement)*
- *Number of startup/shutdown cycles:197 (per SLRA Table 4.3.3-2)*
- *Number of significant temperature fluctuations: 700 (bounds SLRA Table 4.3.3-2)*
- *Number of significant load fluctuations: 7437 (based on torus penetration cycles which bounds values provided in SLRA Section 4.3.4)*

3. Evaluation

3.1 From ASME Section III, NE-3222.4(d) (1) - Atmospheric to Operating Pressure Cycle

The specified number of times (including startup and shutdown) that the pressure will be cycled from atmospheric pressure to operating pressure and back to atmospheric pressure during normal operation does not exceed the number of cycles on the applicable fatigue curve found in Figures I-9-1 and I-9-2 corresponding to an S_a value of 3 times the S_m value for the material at operating temperature.

Evaluation - NE-3222.4(d) (1)

The number of pressure cycles over the full range from zero to normal operating pressure is 266, the value for the reactor pressure vessel exempted components (refer to SLRA Table 4.3.3-2), which is appropriate given that it is reasonable to expect the drywell to be pressurized in most cases when the RPV is pressurized. S_m is the allowable stress intensity value at a given temperature from Tables I-1.1 and I-1.2. S_a corresponds to the allowable amplitude of the alternating stress component and are plotted against the number of cycles on the fatigue curves found in Figures I-9-1 and I-9-2.

At 266 cycles and S_m values taken at 281 degrees F, the resulting fatigue curve cycles at 3 times the Sm from Figures I-9-1 and I-9-2 are as follows:

- *SA-516 Gr. 70 (S_m = 21.4 ksi) = 1983 cycles*
- *SA-333 Gr. 1 (S_m = 17.8 ksi) = 3560 cycles*
- *SA-240 Gr. 304L (S_m = 16.6 ksi) = 18331 cycles*

Therefore, resulting cycles based on the fatigue curve for each material is greater than the expected 266 operating pressure cycles for 80 years and the criterion is met.

3.2 From ASME Section III, NE-3222.4(d) (2) - Normal Operation Pressure Fluctuation

The specified full range of pressure fluctuations during normal operation does not exceed the quantity (1/3) x design pressure x (S_a /S_m) where S_a is the value obtained from the applicable design fatigue curve for the total specified number of significant pressure fluctuations and S_m is the allowable stress intensity for the material at operating temperature. If the total specified number of significant pressure fluctuations exceeds 10^6, the S_a value at N= 10^6may be used. Significant pressure fluctuations are those for which the total excursion exceeds the quantity:

- ***Design Pressure * 1/3 * S/S_m***
- ***where S = the value of S_a obtained from the applicable design fatigue curve for 10^6 cycles.***

Evaluation - NE-3222.4(d) (2)

- ***Normal pressure range = 2 psi; Design Pressure = 56 psi***

Per NE-3222.4(d) (2) significant pressure fluctuations are those for which the excursion exceeds the quantity:

- ***Design Pressure * 1/3 * S/S_m,***
- ***where S = the value of S_a obtained from the applicable design fatigue curve for 10^6cycles.***

At 10^6 cycles, S_a = 12,500 psi for carbon steel.

For SA-516 Gr. 70, S_m = 21,400 psi.

Therefore, for SA-516 Gr. 70, significant pressure fluctuations are those for which the excursion exceeds the quantity:

- ***56*12500/(3*21400) = 11 psi***

For SA-333 Gr. 1, S_m = 17,800 psi.

Therefore, for SA-333 Gr. 1, significant pressure fluctuations are those for which the excursion exceeds the quantity:

- ***56*12500/(3*17800) = 13 psi***

At 10^6cycles, S_a = 26,000 psi for stainless steel.

For SA-240 Gr. 304L, S_m = 16,600 psi.

Therefore, for SA-240 Gr. 304L, significant pressure fluctuations are those for which the excursion exceeds the quantity:

- ***56*26000/(3*16600) = 29 psi***

These pressure values define what is a significant pressure fluctuation.

The expected number of significant pressure fluctuations is less than 17. This is reasonably conservative because the design basis accident is a very rare event, the integrated leak rate test of the entire containment is required no more frequently than 10 years, and there is only one occurrence of the initial structural integrity test.

At 17 pressure fluctuations; from Figure I-9-1, the corresponding S_a for carbon steel is 445,000 psi (which includes SA-516 and SA-333).

At 17 pressure fluctuations; from Figure I-9-2, the corresponding S_a for stainless steel is 507,000 psi (which includes SA-240).

The resulting limit on the normal operation pressure range:

- *For SA-516 Gr. 70: 56*445000/(3*21400) = 388 psi*
- *For SA-333 Gr. 1: 56*445000/(3*17800) = 466 psi*
- *For SA-240 Gr. 304L: 56*507000/(3*16600) = 570 psi*

These values are significantly greater than the normal operation pressure fluctuation range and as a result the normal operation pressure fluctuation meets the requirements of criterion (2).

3.3 From ASME Section III, NE-3222.4(d) (3) - Temperature Difference -Startup and Shutdown

The temperature difference in degrees Fahrenheit between any two adjacent points of the vessel during normal operation does not exceed S_a /(2E α), where S_a is the value obtained from the applicable design fatigue curves for the specified number of startup-shutdown cycles, α is the value of the instantaneous coefficient of thermal expansion at the mean value of the temperatures at the two points as given by Table I-5.0 and E is taken from Table I-6.0 at the two points.

Evaluation - NE-3222.4(d) (3)

The expected number of startup-shutdown cycles is 197 in which the drywell and penetrations experience the maximum temperature difference between any two adjacent points occurring during Startup and Shutdowns. This is the bounding value used in SLRA Table 4.3.3-2.

- *Maximum Operating Temperature for the vessel steel is 281 °F (from the original specification for the drywell)*
- *Minimum Operating Temperature is 50 °F*
- *Maximum operating temperature difference is 281°F – 50 °F = 231 °F*
- *Mean operating temperature = (281°F + 70 °F)/2 = 175.5 °F (70 °F is used in averaging instead of 50 °F to yield conservatively high E*α)*
- *α (carbon steel) = 6.56E-6 in/in/°F*
- *α (stainless steel) = 9.45E-6 in/in/°F*
- *E (carbon steel) = 27.7E6 psi*
- *E (stainless steel) = 27.8E6 psi*

At 197 cycles; from Figure I-9-1 S_a = 156,000 psi (carbon steel). Therefore, for the carbon steel components, the limit on the temperature difference is

- *156000/(2*27.7E6*6.56E-6) = 429 °F.*

At 197 cycles; from Figure I-9-2 S_a = 186,000 psi (stainless steel). Therefore, for the stainless steel components, the limit on the temperature difference is

- *186000/(2*27.8E6*9.45E-6) = 354 °F*

These temperature limits are both significantly greater than the maximum expected temperature difference of 231°F considered for startup and shutdowns.

These results indicate that the containment could experience shutdown and startup temperature differences (between any two adjacent points) of 429 °F (carbon steel) and 354 °F (stainless steel), 197 times over 80 years without exceeding the NE-3222.4(d)(3) threshold. In reality, experiencing the NE-3222.4(d)(3) startup and shutdown temperature difference thresholds stated above for 197 cycles is not credible given that the maximum operating temperature difference of 231 °F.

3.4 From ASME Section III, NE-3222.4(d) (4) - Temperature Difference-Normal Operation

The temperature difference in degrees Fahrenheit between any two adjacent points does not change during normal operation by more than the quantity S_a /(2E α), where S_a is the value obtained from the applicable design fatigue curve found in Figures I-9-1 and I-9-2 for the total specified number of significant temperature-difference fluctuations. A temperature-difference fluctuation is considered to be significant if its total algebraic range exceeds the quantity S/2E α, where S is the value of S_a obtained from the applicable design fatigue curve for 10^6 cycles.

Evaluation - NE-3222.4(d) (4)

The expected number of significant temperature-difference fluctuations in which the drywell and penetrations experience the maximum temperature-difference fluctuations between any two adjacent points is 700, which is reasonably conservative considering that the higher temperature penetrations are excluded from this assessment. This value bounds the values used in SLRA Table 4.3.1-2.

The expected maximum temperature-difference fluctuation equals the difference between maximum operating temperature (281 °F) and the minimum operating temperature 50 °F, which equals 231 °F, and is conservative.

- *α (carbon steel) = 6.56 E-6 in/in/°F*
- *α (stainless steel) = 9.45 E-6 in/in/°F*
- *E (carbon steel) = 27.7E6 psi*
- *E (stainless steel) = 27.8E6 psi*

At 700 cycles, from Figure I-9-1, S_a = 93,700 psi (carbon steel); Therefore, the limit on the temperature-difference for carbon steel is:

- *93700/(2*27.7E6*6.56E-6) = 258 °F.*

At 700 cycles, from Figure I-9-2, S_a = 122,100 psi (stainless steel). Therefore, the limit on the temperature-difference for stainless steel is:

- *122100/(2*27.8E6*9.45E-6) = 233 °F.*

These temperature-difference limits between adjacent points are greater than the expected temperature-difference fluctuation of 231°F between adjacent points. These results indicate that the drywell and penetrations could experience normal operation temperature differences (between any two adjacent points) of 258°F (carbon steel) and 233°F (stainless steel), 700 times over 80 years without exceeding the NE-3222.4(d)(3) threshold.

3.5 From ASME Section III, NE-3222.4(d) (5) - Temperature Difference-Dissimilar Materials

For components fabricated from materials of differing moduli of elasticity or coefficients of thermal expansion, the total algebraic range of temperature fluctuation in deg. F experienced by the component during normal operation does not exceed the magnitude $S_a/2(E_1*\alpha_1 - E_2*\alpha_2)$, where S_a is the value obtained from the applicable design fatigue curve for the total specified number of significant temperature fluctuations, E_1 and E_2 are the moduli of elasticity, and α_1 and α_2 are the values of the instantaneous coefficients of thermal expansion at the mean temperature involved for the two materials of construction (Tables I-5.0 and I-6.0). A temperature fluctuation is considered to be significant if its total excursion exceeds the quantity $S/2(E_1*\alpha_1 - E_2*\alpha_2)$ where S is the value of S_a obtained from the applicable design fatigue curve found in Figures I-9-1 and I-9-2 for 10^6 cycles. If the two materials used have different applicable design fatigue curves, the lower value of S_a is used in applying the rules of this paragraph.

Evaluation - NE-3222.4(d) (5)

The expected number of transients in which the drywell and penetrations experience the maximum temperature fluctuations between any two adjacent points is 700, consistent with the basis provided in the previous section.

The expected maximum temperature fluctuation equals the difference between maximum operating temperature (281°F) and the minimum operating temperature 50°F, which equals 231 °F, and is conservative.

- *α (carbon steel) = 6.56 E-6 in/in/°F*
- *α (stainless steel) = 9.45 E-6 in/in/°F*
- *E (carbon steel) = 27.7 E6 psi*
- *E (stainless steel) = 27.8 E6 psi*
- *At 700 cycles, from Figure I-9-1 S_a = 93,700 psi (carbon steel)*
- *At 700 cycles, from Figure I-9-2 S_a = 122,100 psi (stainless steel)*

Therefore, the limit on the maximum temperature difference for dissimilar materials for carbon steel is:

- ***S_a /2(E_1*α_1 -E_2*α_2) = 579.4°F (carbon steel)***

Therefore, the limit on the maximum temperature difference for dissimilar materials for stainless steel is:

- ***S_a /2(E_1*α_1 -E_2*α_2) = 755.5°F (stainless steel)***

These temperature-difference limits for dissimilar materials between adjacent points are greater than the expected temperature fluctuation of 231°F. These results indicate that portions of the drywell and penetrations with dissimilar metals could experience maximum temperature fluctuations stated above, 700 times over 80 years without exceeding the NE-3222.4(d)(5) threshold. Realistically, this NE-3222.4(d)(5) threshold is not credible given that the maximum operating temperature differences between adjacent dissimilar materials is only 231 °F.

3.6 From ASME Section III, NE-3222.4(d) (6) - Mechanical Loads

The specified full range of mechanical loads, excluding pressure, but including pipe reactions, does not result in load stresses whose range exceeds the S_a value obtained from the applicable design fatigue curve found in Figures I-9-1 and I-9-2 for the total specified number of significant load fluctuations. If the total specified number of significant load fluctuations exceeds 10^6, the S_a value at N= 10^6 may be used. A load fluctuation shall be considered to be significant if the total excursion of load stress exceeds the value of S_a obtained from the applicable design fatigue curve for 10^6 cycles.

Evaluation - NE-3222.4(d) (6)

This criterion addresses mechanical reactions on the containment and not thermal or pressure transients. The expected number of significant load fluctuations is 7437, which bounds the number of cycles used for the torus penetrations and the Unit 3 RHR penetrations.

At 10^6 cycles, S_a = 12,500 psi for carbon steel and S_a = 26,000 psi for stainless steel. The mechanical load stress range limits are as follows:

- ***At 7437 cycles, from Figure I-9-1, S_a = 42,000 psi (carbon steel)***
- ***At 7437 cycles, from Figure I-9-2, S_a = 63,500 psi (stainless steel)***

The corresponding mechanical load stress is

- ***SA-516 Gr. 70 carbon steel: 1.5*23,300 psi = 34,950 psi***
- ***SA-333 Gr. 1 carbon steel: 1.5*18,300 psi = 27,450 psi***
- ***SA-240 Gr. 304L stainless steel: 1.5*16,600 psi = 24,900 psi***

The maximum expected range of mechanical load stress is $1.5S_m$ at 100 °F for the material being analyzed. This value is the maximum permitted primary membrane plus bending stress intensity and one half the maximum permitted primary plus secondary stress intensity range.

Since the mechanical load stress is less than the corresponding S_a for the mechanical load stress range limits, the mechanical load criterion is satisfied.

4. Conclusion

4.1 The assessment above concludes that the drywell structures, penetrations, and associated components meet the fatigue waiver criteria in ASME Section III, Subparagraph NE-3222.4(d) criteria (1)-(6) and that no fatigue analysis was required to be performed for the drywell structures, penetrations, and associated components.

SLRA Section 3.5.2.2.1.6, page 3.5-35, second paragraph, is revised as shown below.

3.5.2.2.1.6 Cracking Due to Stress Corrosion Cracking

Cyclical loading of stainless steel penetration sleeves, penetration bellows, vent line bellows, and dissimilar metal welds is not expected to result in SCC at PBAPS because of the containment design which limits cyclical loadings to acceptable levels. The design of penetrations, which exhibit significant differences in temperature during plant operations, limit loads from the piping onto the drywell by either using bellows or installation of small bore diameter pipe. The containment analysis was completed in accordance with the original design specifications. Fatigue analysis, or a fatigue waiver, for the drywell penetrations was not required since no cyclical loads were identified for these components in the applicable design specifications per the CLB. However, PBAPS Units 2 and 3 process lines that penetrate the drywell and experience significant differences in temperature during plant operation were designed with penetration bellows to ensure that fatigue due to thermal loads during plant operation is acceptable, preventing one potential cause of SCC at the penetrations. The following process lines were designed with penetration bellows: the main steam lines, the feedwater lines, the HPCI steam line, the RHR supply and return lines, the RWCU pump suction line, the core spray discharge lines, and the vessel head spray line. In addition, during the preparation of this application, PBAPS has performed an assessment to show that the drywell would have met the criteria for a fatigue waiver. License renewal applications for other similar Mark I containments designed to later code years have credited fatigue waivers. The criteria that were met for the fatigue waiver included: 1) atmospheric to operating pressure cycles, 2) normal operation pressure fluctuations, 3) temperature differences between startup and shutdown, 4) temperature differences during normal operation, 5) temperature differences at dissimilar metals, and 6) mechanical loads. The drywell fatigue waiver assessment concluded that the components that could be subject to cyclic loading but have no current licensing basis fatigue analysis are subjected to an acceptable and negligible amount of fatigue. The fatigue waiver assessment did not include drywell high temperature mechanical penetrations, listed above, which have bellows or are limited to small pipe diameters. ***A summary of the fatigue waiver assessment is provided in section 3.5.2.2.1.5.*** The containment components with a fatigue analysis that are addressed in Section 3.5.2.2.1.5 and Sections 4.3.2 and 4.6 are representative of the stainless steel penetration sleeves, penetration bellows, vent line bellows, and dissimilar metal welds and can be used as a leading indicator for these components.

Enclosure B

PBAPS Subsequent License Renewal Commitment List Update

Introduction

This Enclosure identifies commitments made in this document and is an update to the PBAPS SLRA Appendix A, Section A.5 License Renewal Commitment List. Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.

Changes to the PBAPS SLRA Appendix A, Section A.5 License Renewal Commitment List are as a result of this SLRA Supplement.

These Enclosure B pages are the same as the corresponding PBAPS SLRA Appendix A, Section A.5 pages included in Enclosure A.

To facilitate understanding, relevant portions of the previously submitted License Renewal Commitment List have been repeated in this Enclosure, with revisions indicated. Previously submitted information is shown in normal font. Additions due to this submittal are highlighted with ***bolded italics*** for inserted text, and ~~strikethroughs~~ for deleted text.

SLRA Appendix A, Section A.5, Second License Renewal Commitment List, Commitment 10, Bolting Integrity, beginning on page A-91, is revised as shown below.

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE*	SOURCE
10	Bolting Integrity	Bolting Integrity is an existing program that will be enhanced to: ***8. Revise engineering procedures to require volumetric examination in accordance with ASME Code Section XI, Table IWB-2500-1, Examination Category B-G-1, regardless of the code classification of the bolting, should high strength bolting greater than 2 inches in diameter be installed.*** ***9. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection to include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High Strength Bolts," are a requirement at Peach Bottom.***	Program will be enhanced no later than six months prior to the second period of extended operation .	Section A.2.1.10 ***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

SLRA Appendix A, Section A.5, Second License Renewal Commitment List, Commitment 17, Fire Water System, Item #6, beginning on page A-95 is revised as shown below:

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE*	SOURCE
17	Fire Water System	6. Perform internal visual inspections of sprinkler and deluge system piping to identify internal corrosion, foreign material, and obstructions to flow. Follow-up volumetric wall thickness examinations will be performed if internal visual inspections detect ~~age-related degradation~~ ***an unexpected level of degradation due to corrosion and corrosion product deposition.*** ~~in excess of what would be expected accounting for design, previous inspection experience, and inspection interval.~~ If organic or foreign material, or internal flow blockage that could result in failure of system function is identified, then an obstruction investigation will be performed within the corrective action program that includes removal of the material, an extent of condition determination, review for increased inspections, extent of follow-up examinations, and a flush in accordance with NFPA 25 Appendix D.5, Flushing Procedures. The internal visual inspections will consist of the following: a. Wet pipe sprinkler systems - 50 percent of the wet pipe sprinkler systems in scope for license renewal will have visual internal inspections of piping by removing a hydraulically remote sprinkler, performed every five years, consistent with NFPA 25, 2011 Edition, Section 14.2. During the next five-year inspection period, the alternate systems previously not inspected shall be inspected. b. Pre-action sprinkler systems - pre-action sprinkler systems in scope for license renewal will have visual internal inspections of piping by removing a hydraulically remote nozzle, performed every five years, consistent with NFPA 25, 2011 Edition, Section 14.2. c. Deluge systems - Yard transformer deluge systems in scope for license renewal will have visual internal inspections of piping by removing a hydraulically remote nozzle, performed every five years, consistent with NFPA 25, 2011 Edition, Section 14.2.	Program will be enhanced no later than six months prior to the second period of extended operation. Inspections that are to be completed prior to the second period of extended operation will be completed no later than six months prior to the second period of extended operation, or no later than the last refueling outage prior to the second period of extended operation.	Section A.2.1.17 ***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

SLRA Appendix A, Section A.5, Second License Renewal Commitment List, Commitment 30 on page A-106 is revised to include added commitments as shown below.

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE*	SOURCE
30	ASME Section XI, Subsection IWE	ASME Section XI, Subsection IWE is an existing program that will be enhanced to: 1. Perform surface examinations on accessible portions of high temperature drywell mechanical penetrations, in addition to visual examinations, to detect cracking, once per 10-year interval during the second period of extended operation. ***2. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.*** ***3. Implement a one-time supplemental volumetric examination of the containment metal shell surfaces that are inaccessible from one side, if triggered by plant-specific OE. The trigger for this supplemental examination is plant-specific occurrence or recurrence of measurable metal shell corrosion (base metal material loss exceeding 10 percent of nominal plate thickness) initiated on the inaccessible side or areas, identified since the date of issuance of the first renewed license. This supplemental volumetric examination consists of a sample of one-foot square locations that include both randomly-selected and focused areas most likely to experience degradation based on plant-specific OE and/or other relevant considerations such as environment. The sample size, locations, and any needed scope expansion (based on findings) for this one-time set of volumetric examinations should be determined on a plant-specific basis to demonstrate statistically with 95 percent confidence that 95 percent of the accessible portion of the containment liner is not experiencing corrosion degradation with greater than 10 percent loss of nominal thickness.***	Program will be enhanced no later than six months prior to the second period of extended operation.	Section A.2.1.30 ***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

SLRA Appendix A, Section A.5, Second License Renewal Commitment List, Commitment 31 on page A-107 is revised to include added commitments as shown below.

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE*	SOURCE
31	ASME Section XI, Subsection IWF	ASME Section XI, Subsection IWF is an existing program that will be enhanced to: 1. Perform periodic evaluations of the acceptability of inaccessible areas of supports (e.g., portions of supports encased in concrete, buried underground, or encapsulated by guard pipe), when conditions exist in accessible areas that could indicate the presence of, or result in, degradation to inaccessible areas of supports. Perform these evaluations once every 10 years during the second period of extended operation. 2. Perform a one-time inspection of an additional five percent of the currently inspected sample size specified in Table IWF-2500-1 for Class 1, 2, and 3 piping supports. Conduct the one-time inspection within the five years prior to entering the second period of extended operation. Select the additional supports from the remaining population of IWF piping supports. Ensure that the sample expansion includes components that are most susceptible to age-related degradation (i.e., based on factors such as time in service, material, and aggressiveness of the environment). 3. Perform VT-3 examinations of all ASTM A-490 bolting materials, used for the reactor vessel support skirts and for the core spray pump supports once per 10-year interval during the second period of extended operation. Perform volumetric examination comparable to that of ASME Code Section XI, Table IWB-2500-1, Examination Category B-G-1, of 12 ASTM A490 bolts at each of the reactor vessel support skirts, once per 10-year interval during the second period of extended operation. ***4. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.***	Program will be enhanced in accordance with the schedule described within the enhancements. Inspections that are required to be performed in the five-year period prior to the second period of extended operation will be completed no later than six months prior to the second period of extended operation, or no later than the last refueling outage prior to the second period of extended operation.	Section A.2.1.31 ***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

SLRA Appendix A, Section A.5, Second License Renewal Commitment List, Commitment 34 on page A-110 is revised to include added commitments as shown below.

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE*	SOURCE
34	Structures Monitoring	10. Expand the program to monitor elastomeric vibration isolators and bearing pads for cracking, loss of material, and hardening. Supplement visual inspection of elastomeric elements with tactile inspection to detect hardening, if the intended function is suspect. Establish acceptance criteria for elastomeric pads and vibration isolation elements as no loss of material, cracking, or hardening that can lead to loss of isolation or support function. 11. Clarify that loose bolts and nuts and cracked bolts are not acceptable unless accepted by engineering evaluations. 12. Expand the program to inspect the fiberglass outer covering of permanent shielding blankets for signs of tears. If a tear is found, enter the condition into the corrective action program for evaluation. Repair or replace the permanent shielding, unless an evaluation determines that the condition is acceptable. ***13. Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.***	Program will be enhanced no later than six months prior to the second period of extended operation. Baseline inspections will be completed no later than six months prior to the second period of extended operation, or no later than the last refueling outage prior to the second period of extended operation.	Section A.2.1.34 ***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

SLRA Appendix A, Section A.5, Second License Renewal Commitment List, Commitment 35 on page A-111 is revised to include added commitments as shown below.

NO.	PROGRAM OR TOPIC	COMMITMENT		IMPLEMENTATION SCHEDULE*	SOURCE
35	Inspection of Water-Control Structures Associated with Nuclear Power Plants	8.	Evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence of, or result in, degradation to such inaccessible areas.	Program will be enhanced no later than six months prior to the second period of extended operation. Baseline inspections will be completed no later than six months prior to the second period of extended operation, or no later than the last refueling outage prior to the second period of extended operation.	Section A.2.1.35
		9.	Document the concrete conditions of submerged concrete structures.		
		10.	Specify a six-year frequency for the inspection of the submerged portions of the traveling screen bays to match the inspection frequency of the submerged portions of the Circulating Water Pump Structure bays.		
		11.	Perform inspections under the enhanced program in order to establish quantitative baseline inspection data prior to the second period of extended operation.		
		12.	Provide evaluation criteria for structural concrete using quantitative second tier criteria of Chapter 5 in ACI 349.3R.		
		13.	Clarify that loose bolts and nuts and cracked bolts are not acceptable unless accepted by engineering evaluations.		
		14.	***Clarify that the recommended guidance for proper selection of bolting material and lubricants, and appropriate installation torque or tension to prevent or minimize loss of bolting preload and cracking of high-strength bolting is a requirement at Peach Bottom in accordance with the guidelines provided in EPRI NP-5067 and TR-104213. Clarify that the recommended requirements for storage, lubricant selection, and bolting and coating material selection include the recommendations in Section 2 of Research Council on Structural Connections (RCSC) publication "Specification for Structural Joints Using High-Strength Bolts," are a requirement at Peach Bottom.***		***Exelon Letter PBAPS SLRA Supplement No. 2, dated January 23, 2019***

* The dates for the start of the respective second periods of extended operation for Peach Bottom Atomic Power Station, Units 2 and 3 are:

Peach Bottom Atomic Power Station Unit 2: August 8, 2033 Peach Bottom Atomic Power Station Unit 3: July 2, 2034