Perry Nuclear Power Plant
Rod L. Penfield
Site Vice President
10 Center Road
Perry, Ohio 44081

L-24-200
September 5, 2024

10 CFR 54

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

SUBJECT:
Perry Nuclear Power Plant, Unit No. 1
Docket No. 50-440, License No. NPF-58
License Renewal Application for the Perry Nuclear Power Plant - Revision to Supplement 4 for Editorial Corrections

REFERENCES:

1. Letter L-23-146, from Rod L. Penfield to the Nuclear Regulatory Commission, dated July 3, 2023, submitting the Perry Nuclear Power Plant License Renewal Application Revision 0 (ADAMS Accession No. ML23184A081)
2. Nuclear Regulatory Commission issuance of Conforming License Amendment 203 to Facility Operating License NPF-58 (Enclosure 1) for the license transfer for the Perry Nuclear Power Plant (ADAMS Accession Nos. ML24057A075 and ML24057A077)
3. Letter L-24-110, from Rod L. Penfield to the Nuclear Regulatory Commission, dated July 3, 2024, submitting 10 CFR 54.21(b) Annual Amendment to the Perry Nuclear Power Plant License Renewal Application (ADAMS Accession No. ML24185A092)
4. Letter from Lauren K. Gibson to Rod L. Penfield, Perry Nuclear Power Plant, Unit No. 1 dated September 25, 2023 – Aging Management Audit Plan Regarding the License Renewal Application Review (ADAMS Accession No. ML23261B019)
5. Letter L-24-178, from Rod L. Penfield to the Nuclear Regulatory Commission, dated August 8, 2024, submitting the Perry Nuclear Power Plant License Renewal Application Revision 0, Supplement 4 (ADAMS Accession No. ML24221A093)

On July 3, 2023, Energy Harbor Nuclear Corp. submitted a license renewal application (LRA) for the Facility Operating License for the Perry Nuclear Power Plant, Unit No. 1 (PNPP) (Reference 1). Subsequent to the submittal of the PNPP LRA, the PNPP Facility Operating License has been transferred to Vistra Operations Company LLC (VistraOps) per conforming license Amendment 203 and the license transfer transaction was closed on March 1, 2024 (EPID L-2024-LLM-0000) (Reference 2). The license transfer changes impacting the PNPP LRA are documented in the annual amendment required by 10 CFR 54.21(b), submitted on July 3, 2024 (Reference 3).

During the Nuclear Regulatory Commission (NRC) staff's aging management audit of the PNPP LRA (Reference 4), the PNPP Staff agreed to supplement the LRA with clarifying information which has led to several LRA supplements. On August 8, 2024, VistraOps submitted the fourth supplement to the PNPP LRA that provided clarifying information related to the selective leaching aging management program and other updates of the PNPP LRA as addressed via the audit and breakout discussions with the NRC auditors (Reference 5).

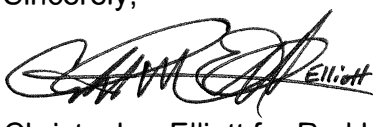
The attachment to this letter provides a revised Supplement 4 to the PNPP LRA to implement minor editorial corrections. The attached revision supersedes the previously submitted Supplement 4 (Reference 5) and specifically includes corrected attachments (Attachments 3, 6, 17 and 18). For clarity, to differentiate between the changes indicated in the initial Supplement 4, the editorial corrections for this revision to Supplement 4 are indicated by ~~**bolded blue strikethrough**~~ for text to be deleted and **bolded blue underlined text** for text be added.

There are no additional changes to the commitments provided in the PNPP LRA Appendix A (Table A.3) in this revised supplement.

If there are any questions or if additional information is required, please contact Mr. Mark Bensi, PNPP License Renewal Manager at (440) 280-6179 or via email at Mark.Bensi@vistracorp.com.

I declare under penalty of perjury that the foregoing is true and correct. Executed on September 5, 2024.

Sincerely,



Christopher Elliott for Rod L. Penfield

Attachments:
PNPP LRA Supplement 4 Revision 1 - Attachments for Editorial Corrections

cc: NRC Region III Administrator
NRC Resident Inspector
NRR Project Manager
Executive Director, Ohio Emergency Management Agency, State of Ohio (NRC Liaison)
Utility Radiological Safety Board

PNPP LRA Supplement 4 Revision 1

Attachments Index for Selective Leaching Program Update and Other Supplemented LRA Sections and Tables

Attachment No.	LRA Section, Table or Appendix Supplemented	Subject	Source
1	Table of Contents	Update for addition of new plant specific Selective Leaching Program	Applicant Initiated
2	Section 2.1.1.3.5	Clarification for 125 VDC circuits	Applicant Initiated
3	Section 2.3.3.45 Table 2.3.3-45	Plant Radiation Monitoring and Process Monitoring update	Applicant Initiated
4	Table 3.3.1	Update for addition of plant new plant specific Selective Leaching Program	Applicant Initiated
5	Section 3.3.2.1.22 Table 3.3.2-22	Update for addition of plant new plant specific Selective Leaching Program	Applicant Initiated
6	Section 3.3.2.1.24 Table 3.3.2-24	Editorial corrections and incorporation of new plant specific Selective Leaching Program	Applicant Initiated
7	Section 3.3.2.1.47 Table 3.3.2-47	Update for addition of plant new plant specific Selective Leaching Program	Applicant Initiated
8	Section 3.3.2.1.45 Table 3.3.2-45	Plant Radiation Monitoring and Process Monitoring update	Applicant Initiated
9	Not Used	Not Used	Not Used
10	Table A.1	Update for addition of plant new plant specific Selective Leaching Program	Applicant Initiated
11	Section A.1.42	Update for addition of plant new plant specific Selective Leaching Program	Applicant Initiated

Attachment No.	LRA Section, Table or Appendix Supplemented	Subject	Source
12	Section A.1.45	Update for addition of plant new plant specific Selective Leaching Program	Applicant Initiated
13	Table A.3	Update for addition of plant new plant specific Selective Leaching Program	Applicant Initiated
14	Table B.1-1	Update for addition of plant new plant specific Selective Leaching Program	Applicant Initiated
15	Table B.1-2	Update for addition of plant new plant specific Selective Leaching Program	Applicant Initiated
16	Section B.2.24	Update for Fuse Holder Program	Applicant Initiated
17	Section B.2.42	Update for addition of plant new plant specific Selective Leaching Program	Applicant Initiated
18	Section B.2.45	Update for addition of plant new plant specific Selective Leaching Program	Applicant Initiated

Key for Attachments:

Acronyms:

LRA = License Renewal Application

TRP = Technical Review Package from NRC aging management audit inquiry

S&S = NRC Scoping and Screening audit inquiry

Each of the attachments provides a description of the change and the resulting LRA changes.

As described in the cover letter, the attachments reflect the Perry Nuclear Power Plant LRA changes made via the following Vistra correspondence:

1. LRA Supplement 1 (Vistra Letter L024-109)
2. LRA Supplement 2 (Vistra Letter L-24-020) and
3. LRA Annual Update (Vistra Letter L-24-110)
4. LRA Supplement 3 (Vistra Letter L-24-108)

Therefore, the LRA changes made as a result of this revised supplement (Supplement 4, Revision 1) build on and are made on clean LRA pages that reflect the previously docketed Vistra correspondence listed above.

Revisions to LRA tables may be shown by providing excerpts from each affected table, i.e., only the affected parts of the table may be included in the attachment.

Consistent with LRA Supplements 1, 2, 3, and the Annual Update, changes for Supplement 4 Revision 0 are indicated by, **red, bolded and underlined text** for added text and ~~strikethrough~~ for text to be deleted.

For clarity, to differentiate between the changes previously indicated in Supplement 4 Revision 0, the editorial corrections for this letter, Supplement 4 Revision 1 are indicated by **~~bolded blue strikethrough~~** text for text to be deleted and **bolded blue underlined text** to indicate the text be added.

Note that text editing changes to some of the attachments such as spacing, font consistency changes etc., are not indicated via coloring as these are inconsequential.

Attachment 1

LRA Section: Preface, Table of Contents

LRA Page Number(s): xxiv and xxviii

References: Applicant Initiated

Description of Change: The PNPP LRA Table of Contents is revised to reflect inclusion of new Section A.1.45 and B.2.45. Both new sections address the new Plant-Specific Periodic Inspections for Selective Leaching Program.

PNPP LRA Preface, Table of Contents, Pages xxiv and xxviii are revised as follows:

NOTE: Only the portion of the Table of Contents (TOC) on LRA pages xxiv and xxviii have been included. The remainder of the TOC is unchanged.

Page xxiv

Page xxviii

Attachment 2

LRA Section: 2.1.1.3.5

LRA Page Number(s): 2.1-12

References: Applicant Initiated

Description of Change: Provide clarification that the 125 VDC circuits are described in Table 2.2-3.

PNPP LRA Section 2.1.1.3.5, Page 2.1-12 is revised as follows:

2.1.1.3.5 Station Blackout (10 CFR 50.63)

10 CFR 50.63 [Reference 1.3-7], requires that each light-water-cooled nuclear power plant be able to withstand, for a specified duration, and recover from a station blackout (SBO). An SBO is the loss of offsite and onsite AC electric power to the essential and nonessential switchgear buses in a nuclear power plant. It does not include the loss of AC power fed from inverters powered by station batteries or by alternate AC sources. The objective of this requirement is to assure that nuclear power plants can withstand an SBO while maintaining adequate reactor core cooling and containment integrity for the specified duration.

Appendix 15H of the UFSAR describes the licensing bases for SBO at the Perry Nuclear Power Plant (PNPP). PNPP has developed a four-hour coping analysis to address the requirements of 10 CFR 50.63. Based on the PNPP current licensing bases for SBO, structure and system intended functions performed in support of 10 CFR 50.63 requirements were determined. The results of this determination are provided for mechanical systems in Section 2.3, for structures in Section 2.4, and electrical commodities in Section 2.5.

For Station Blackout Recovery, the license renewal scoping boundary is extended to the first interconnection device that would restore offsite power to the main switchyard busses and the step-up station transformer (startup transformers). At PNPP, the boundary with the offsite transmission system has been defined at the 345kV switchyard circuit breakers: breakers S-612, S-620, S-621, S-650, S-652, S-660 and S-661. Scoping boundary drawing 206-0010 (Figure 2.1-1) shows the Station Blackout Recovery boundary in red. This boundary definition is consistent with NUREG-1800 [Reference 1.3-9], Section 2.1.3.1.

The 125 VDC control circuits for the switchyard boundary breakers, and their protective structures are included in scope and subject to aging management review. **These circuits are identified in Table 2.2-3 System S42 (reference UFSAR 8.2.2.1.f).**

Attachment 3

LRA Section: 2.3.3.45, Table 2.3.3-45

LRA Page Number(s): 2.3-150 through 2.3-156

References: Applicant Initiated

Description of Change: While reviewing a revision to the Plant Radiation Monitoring and Process Monitoring Maintenance Rule Basis Document, it was identified that some of the non-safety related radiation monitors have sampling lines and internal components that would also perform a passive pressure boundary function for the Control Room Envelope and/or the Secondary Containment boundary. As a result, the scoping for the system was revised to reflect the revised system boundary and additional 10 CFR 54.4(a)(2) system functions.

PNPP LRA Section 2.3.3.45, Pages 2.3-150 through 2.3-156, discussion text is revised:

> **Note: Additional shading was added in the Ventilation Systems section of the table included in the LRA section. This additional shading is denoted by a RED box.**

2.3.3.45 Plant Radiation Monitoring and Process Monitoring D17), andPost Accident Radiation Monitoring (D19)

System Description

This system consists of airborne radiation monitors, gaseous process and effluent radiation monitors, liquid process and effluent radiation monitors, and post-accident radiation monitors. The intermediate building ventilation system (M33) flow straighteners in the Unit 1 and 2 plant Vents are also evaluated within this system.

Airborne radiation monitoring:

An airborne radiation monitor typically consists of a particulate measuring channel, an iodine measuring channel and a gas measuring channel. A representative sample of air from a ventilation duct is drawn through a sample line to the airborne monitor unit by means of an air blower. Sampling of the ducts is achieved using an isokinetic sample probe placed in the air stream. The sample passes through a particulate, iodine and gaschannel in series. Each channel is independent. In the particulate channel, the sample air passes through a fixed or

moving filter which collects particulates and is monitoredby a beta scintillation detector, the output of which is pre-amplified and transmitted to a ratemeter located in the control room. In the iodine channel, the sample passes through an activated charcoal cartridge which traps the radioactive iodine. The gas is exhausted back to the ventilation duct. Differential pressure switches across the filter and charcoal cartridges are provided to give a low flow alarm at the unit and in the control room.

Gaseous process and effluent monitoring:

Gaseous process monitors are provided for detecting and monitoring radiation levels incertain plant process streams.

The Gaseous effluent units monitor a sample of the effluent discharge for particulate, iodine and gas radioactivity and provide samples of the collected particulate and halogen for laboratory analysis. For the unit vents a representative sample is continuously extracted from each plant vent through an isokinetic probe. The sample issupplied through a 1-inch sample line which is also used to supply a representative sample to the post-accident effluent radiation monitors. For the offgas and turbine building/heater bay vents a representative sample is continuously extracted from the vent pipe downstream of the exhaust fans.

Liquid process and effluent radiation monitoring:

These units monitor the gamma radiation levels of liquid process and effluent streams. With the exception of the radwaste system effluent, the streams monitored normally contain only background levels of radioactive materials. Increases in radiation level may be indicative of heat exchanger leakage or equipment malfunction.

For each liquid monitoring location, except for the underdrain system, a continuous sample is extracted from the liquid process pipe, passed through a liquid sample panel which contains a detection assembly for gross gamma radiation monitoring, and returned to the process pipe. The detection assembly consists of a scintillation detector mounted in a shielded sample chamber equipped with a check source. A ratemeter in the control room displays the measured gross radiation level and the analog signal is recorded.

Post-accident radiation monitoring:

Some monitors are designated and installed as post-accident radiation instruments. They provide radiation level readings and alarm functions. These monitors include areamonitors, vent radioactive gas release monitors and area airborne activity monitors.

System Boundary

System components subject to aging management review include the following, as shown on LR boundary drawings:

- Safety-related post-accident effluent radiation monitors.
- Safety-related air sample piping and the attached nonsafety air sample piping up to an equivalent anchor for the containment and drywell atmosphere monitors,
- Nonsafety-related (liquid) sample piping, valves, pumps and monitor equipment for the ADHR service water, radwaste effluent to ESW, NCC, and ESW loops A andB monitors.
- **Non-safety related sample piping, valves, and pumps associated with radiation monitors for the Annulus Exhaust Gas Treatment system and the Control Room HVAC and Emergency Recirculation system.**

Other radiation monitors either have no passive mechanical components, or do not perform a function corresponding to the criteria in 10 CFR 54.4.

System Functions (and scoping criteria, if intended function)

The system is within the scope of license renewal because it contains safety-related components that are relied upon to remain functional during or following a design basisevent, because it contains nonsafety-related components whose failure could prevent accomplishment of a safety-related function, and because it is relied on to perform functions that demonstrates compliance with the regulations for EQ.

Safety-related piping provides system pressure boundary integrity. [10 CFR 54.4(a)(1)].

Containment isolation limits radiological release. [10 CFR 54.4(a)(1)]

Indication from the intermediate building ventilation safety related flow elements (straighteners) is used together with the Unit 1 & 2 plant vent radiation monitors to establish a release rate. [10 CFR 54.4(a)(1)]

The integrity of nonsafety-related, fluid-retaining components in safety-related area(s) prevents interactions that could affect safety-related SSCs. [10 CFR 54.4(a)(2)]

Nonsafety-related piping provides pressure boundary integrity for the Control Room Envelope and Secondary Containment. [10 CFR 54.4(a)(2)]

Nonsafety-related piping up to and including the first equivalent anchor beyond safety/nonsafety interface(s) provides mechanical support for safety-related SSCs. [10 CFR 54.4(a)(2)]

The system contains components within the scope of 10 CFR 50.49. [10 CFR 54.4(a)(3) – EQ]

~~– EQ]~~

Plant radiation monitoring provides actuation logic to limit radiological release. [10CFR 54.4(a)(1) applicable only to active electrical components].

Process radiation monitoring systems are provided to monitor and control radioactivityin process and effluent streams and to activate appropriate alarms and controls.

Provide the capability to detect an offgas system failure by an alarmed increase inactivity at the plant vent.

Component Types Subject to Aging Management Review

Table 2.3.3-45 lists the component types that require aging management review and their intended functions and Table 2.3.3-45a summarizes the scoping determination for individual monitors.

Table 3.3.2-45, Auxiliary Systems – Plant Radiation Monitoring and Process Monitoring and Post Accident Radiation Monitoring System – Summary of Aging Management Evaluation, provides the results of the aging management review.

Table 2.3.3-45

Plant Radiation Monitoring and Process Monitoring and Post Accident Radiation Monitoring

Component Types Subject to Aging Management Review

Component Type	Intended function
Bolting	Leakage boundary, Pressure boundary, Structural integrity
Detector housing	Leakage boundary, Pressure boundary
Filter housing	Pressure boundary
Flexible hose	Leakage boundary
Flow element	Pressure boundary
Flow straightener	Pressure boundary
Piping	Leakage boundary, Pressure boundary, Structural integrity
Pump casing	Leakage boundary, Pressure boundary
Valve body	Leakage boundary, Pressure boundary, Structural integrity

Table 2.3.3-45a

Scoping Determination for Individual Plant Monitors

The following table summarizes the scoping determination for individual monitors. The safety-related [(a)(1)] determination was based on quality classification. The [(a)(2)] determination was based on location of fluid-filled components. The (a)(2) determination was also based on providing a boundary function for either the Control Room Envelope or Secondary Containment for ventilation systems radiation monitors. The [(a)(3)] EQ functionwas determined based on the SAP EQ classification. No CLB (a)(2) or (a)(3) function otherthan EQ has been identified by review of UFSAR and regulated event bases. Only the shaded monitors have passive components that are within scope.

Monitor		Passive ?	(a)(1)	(a)(2)	(a)(3)	Drawing
EFFLUENT						
Offgas Vent Pipe	1D17K0830	Y	N	N	N	806-0008
Unit 1 Plant Vent	1D17K0780	Y	N	N	N	806-0007
Unit 2 Plant Vent	2D17K0780	Y	N	N	N	856-0007
Turbine Building/ Heater Bay	1D17K0850	Y	N	N	N	806-0023
VENTILATION SYSTEMS						
Containment Vessel and Drywell Purge Exhaust	1D17K0660	Y	N	N	N	806-0006
Annulus Exhaust Train "A"	1D17K0690A	Y	N	**Y**	N	806-0006
Annulus Exhaust Train "B"	1D17K0690B	Y	N	**Y**	N	806-0006
Control Room HVAC and Emerg Recirc	0D17K0770	Y	N	**Y**	N	806-0005
Radwaste Building Ventilation Exhaust	0D17K0720	Y	N	N	N	806-0003
Intermediate Building Ventilation Exhaust	0D17K0730	Y	N	N	N	806-0003
Offgas Building Ventilation Exhaust	1D17K0760	Y	N	N	N	806-0004
Auxiliary Building Ventilation Exhaust	1D17K0700	Y	N	N	N	806-0004

Monitor		Passive ?	(a)(1)	(a)(2)	(a)(3)	Drawing
Fuel Handling Building Ventilation Exhaust	0D17K0710	Y	N	N	N	806-0005
ATMOSPHERE (No Ventilation Train)						
Drywell Atmosphere	1D17K0670	Y	Y	N	Y	806-0004
Containment Atmosphere	1D17K0680	Y	Y	N	Y	806-0007
Miscellaneous						
Steam Packing Exhauster	1D17K0840	N	N	N	N	806-0008
Process Monitors						
ESW Loop A	1D17K0604	Y	N	Y	N	806-0010
ESW Loop B	1D17K0605	Y	N	Y	N	806-0010
Radwaste to ESW	0D17K0606	Y	N	Y	N	806-0009
NCC	0D17K0607	Y	N	Y	N	806-0009
ADHR Serv Wtr	1D17K0608	Y	N	Y	N	806-0009
Offgas Pre-treatment	1D17K0612	Y	N	N	N	806-0018
Offgas Post-treatment A	1D17K0601A	Y	N	N	N	806-0019
Offgas Post-treatment B	1D17K0601B	Y	N	N	N	806-0019
Containment Ventilation Exhaust A-D	1D17K0609A-D	N	Y	N	N	912-0604 806-0024
Main Steam Line A-D	1D17K0610A-D	N	Y	N	Y	806-0024
Carbon Bed Vault A	1D17K0611A	N	N	N	N	806-0025
Carbon Bed Vault B	1D17K0611B	N	N	N	N	806-0025
Underdrain Manhole 23	0D17K0820A	N	N	N	N	806-0017

Monitor		Passive ?	(a)(1)	(a)(2)	(a)(3)	Drawing
Underdrain Manhole 20	0D17K0820B	N	N	N	N	806-0017
Post-Accident Monitors						
Drywell & Rx Bldg A	1D19K0100	N	Y	N	Y	806-0033
Drywell & Rx Bldg B	1D19K0200	N	Y	N	Y	806-0033
TSC Area	1D19K0650	N	N	N	N	806-0034
Plant Vent Gas (Unit 1)	1D19K0300	Y	Y	N	N	806-0033
Off-Gas Vent Gas	1D19K0400	Y	Y	N	N	806-0033
Turb/Heater Bay Vent Gas	1D19K0500	Y	Y	N	N	806-0033
Plant Vent Gas (Unit 2)	2D19K0300	Y	Y	N	N	856-0033
TSC Airborne	0D19K0600	Y	N	N	N	806-0034

References

UFSAR: 1.2.2.10.1, 15.7.1.1.2.b, 11.5, 12.3.4

License Renewal Drawings: 806-0004, **806-0005, 806-0006**, 806-0007, 806-0009, 806-0010, 806-0033, 856-0033, 912-0613

Attachment 4

LRA Section: Table 3.3.1

LRA Page Number(s): 3.3-107

References: Applicant Initiated

Description of Change: The purpose of NUREG-1801, XI.M33 is to demonstrate the absence of selective leaching. The program for selective leaching of materials ensures the integrity of the components made of gray cast iron and copper alloys (except for inhibited brass) that contain greater than 15 percent zinc (> 15% Zn) or greater than 8 percent aluminum (>8% Al in the case of aluminum-bronze) exposed to a raw water, closed cooling water, treated water, or ground water environment that may lead to selective leaching of one of the metal components where there has not been previous experience of selective leaching. Program scope states “For materials and environments where selective leaching is currently occurring…, a plant-specific program is required.” Plant-specific OE CR-2024-02317 identifies specific instances of selective leaching occurring at PNPP.

PNPP LRA Table 3.3.1, Page 3.3-107 is revised:

Note: Only those table rows with revised text are included in the following table. Table rows unaffected by these changes are omitted from this attachment,

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
3.3.1-72 (LR-ISG-2012-02)	Gray cast iron, Copper alloy (>15% Zn or >8% Al) Piping, piping components, and piping elements, Heat exchanger components exposed to Treated water, Closed-cycle cooling water, Soil, Raw water	Loss of material due to selective leaching	Chapter XI.M33, "Selective Leaching"	No	Consistent with NUREG-1801 (as modified by LR-ISG-2012-02) ~~and~~ with ~~some~~one program exception~~s~~ and the following clarifications. The Selective Leaching program will manage loss of material due to selective leaching for gray cast iron, ductile iron and copper alloy (>15% Zn) components exposed to treated water, closed-cycle cooling water, ~~soil,~~ raw water, waste water, or condensation. Evidence of selective leaching was found in three material/environment populations including gray cast iron exposed to raw water and soil and ductile iron exposed to soil. See Section B.2.45 for the Plant-Specific Inspections for Selective Leaching Program for those populations. In addition~~,~~ to the Auxiliary systems, gray cast iron heat exchanger components exposed to Closed-cycle cooling water and gray cast iron heat exchanger, strainer body, valves, and ductile iron pump casing exposed to condensation in the Off Gas system are ~~also~~ aligned

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
					to this row. Also, copper alloy >15% zinc (brass), pressure regulators exposed to treated water in the Nuclear Boiler system are aligned with this row. See Appendix B Section B.2.42~~1~~ for Selective Leaching program exceptions to NUREG-1801.

Attachment 5

LRA Section: 3.3.2.1.22 and Table 3.3.2-22

LRA Page Number(s): 3.3-29, 3.3-287 through 3.3-289

References: Applicant Initiated

Description of Change: A new aging management program, Plant-Specific Periodic Inspections for Selective Leaching Program, will manage the selective leaching for Gray cast iron components exposed to Raw water since selective leaching has occurred in a different system for this material environment combination. There are no ductile iron components in this system subject to aging management. Prior changes to Table 3.3.2-22 made by PNPP Licensing letter L-24-020 are included but not shown as a change here.

PNPP LRA Section 3.3.2.1.22 is changed to read:

Materials

Emergency Service Water Screen Wash system components are constructed of the following materials:

- Gray cast iron
- Stainless steel
- Steel

Environments

Emergency Service Water Screen Wash system components are exposed to the following environments:

- Air – indoor, uncontrolled
- Lubricating oil
- Raw water

Aging Effects Requiring Management

The following aging effects associated with the Emergency Service Water Screen Wash system require management:

- Loss of material
- Loss of preload

Aging Management Programs

The following aging management programs manage the effects of aging on Emergency Service Water Screen Wash system components:

- Bolting Integrity (B.2.7)
- External Surfaces Monitoring of Mechanical Components (B.2.18)
- Lubricating Oil Analysis (B.2.28)
- One-Time Inspection (B.2.35)
- Open-Cycle Cooling Water System (B.2.37)
- **Plant-Specific Periodic Inspections for Selective Leaching (B.2.45)**
- Selective Leaching (B.2.42)

PNPP LRA Table 3.3.2-22, Page 3.3-288, is revised as follows:

Table 3.3.2-22

Auxiliary Systems – Emergency Service Water Screen WashSummary of Aging Management Evaluation

Table 3.3.2-22 - Emergency Service Water Screen Wash System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801Item**	**Table 1 Item**	**Notes**
1	Bolting	Pressure boundary	Steel	Air – indoor, uncontrolled(Ext)	Loss of material	Bolting Integrity	VII.I.AP-125	3.3.1-12	B
2	Bolting	Pressure boundary	Steel	Air – indoor, uncontrolled(Ext)	Loss of preload	Bolting Integrity	VII.I.AP-124	3.3.1-15	B
3	Bolting	Pressure boundary	Steel	Raw water (Ext)	Loss of material	Bolting Integrity	VII.C1.AP-183	3.3.1-38	E
4	Bolting	Pressure boundary	Steel	Raw water (Ext)	Loss of preload	Bolting Integrity	VII.I.AP-264	3.3.1-15	B
5	Nozzle	Flow control	Stainless steel	Air – indoor, uncontrolled(Ext)	None	None	VII.J.AP-17	3.3.1-120	A
6	Nozzle	Flow control	Stainless steel	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.A-54	3.3.1-40	A

Table 3.3.2-22 - Emergency Service Water Screen Wash System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801Item**	**Table 1 Item**	**Notes**
7	Piping	Leakage boundary	Stainless steel	Air – indoor, uncontrolled(Ext)	None	None	VII.J.AP-17	3.3.1-120	A
8	Piping	Leakage boundary	Stainless steel	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.A-54	3.3.1-40	A
9	Piping	Pressure boundary	Stainless steel	Air – indoor, uncontrolled(Ext)	None	None	VII.J.AP-17	3.3.1-120	A
10	Piping	Pressure boundary	Stainless steel	Lubricating oil (Int)	Loss of material	Lubricating Oil Analysis and One-Time Inspection	VII.C1.AP-138	3.3.1-100	A
11	Piping	Pressure boundary	Stainless steel	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.A-54	3.3.1-40	A
12	Piping	Pressure boundary	Steel	Air – indoor, uncontrolled(Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
13	Piping	Pressure boundary	Steel	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.AP-194 (LR-ISG-2013-01)	3.3.1-37	A
14	Pump casing (Bowl)	Pressure boundary	Stainless steel	Raw water (Ext)	Loss of material	Open-Cycle Cooling Water System	VII.C1.A-54	3.3.1-40	A

Table 3.3.2-22 - Emergency Service Water Screen Wash System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801Item**	**Table 1 Item**	**Notes**
15	Pump casing (Bowl)	Pressure boundary	Stainless steel	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.A-54	3.3.1-40	A
16	Pump casing (Column)	Pressure boundary	Steel	Air – indoor, uncontrolled(Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
17	Pump casing (Column)	Pressure boundary	Steel	Raw water (Ext)	Loss of material	Open-Cycle Cooling Water System	VII.C1.AP-194 (LR-ISG-2013-01)	3.3.1-37	A
18	Pump casing (Column)	Pressure boundary	Steel	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.AP-194 (LR-ISG-2013-01)	3.3.1-37	A
19	Strainer body	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled(Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
20	Strainer body	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.AP-194 (LR-ISG-2013-01)	3.3.1-37	A
21	Strainer body	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.C1.A-51(LR-ISG-2012-02)	3.3.1-72	~~B~~E
22	Traveling screen	Filtration	Stainless steel	Raw water (Ext)	Loss of material	Open-Cycle Cooling Water System	VII.C1.A-54	3.3.1-40	A

Table 3.3.2-22 - Emergency Service Water Screen Wash System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801Item**	**Table 1 Item**	**Notes**
23	Valve body	Pressure boundary	Stainless steel	Air – indoor, uncontrolled(Ext)	None	None	VII.J.AP-17	3.3.1-120	A
24	Valve body	Pressure boundary	Stainless steel	Lubricating oil (Int)	Loss of material	Lubricating Oil Analysis and One-Time Inspection	VII.C1.AP-138	3.3.1-100	A
25	Valve body	Pressure boundary	Steel	Air – indoor, uncontrolled(Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
26	Valve body	Pressure boundary	Steel	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.AP-194 (LR-ISG-2013-01)	3.3.1-37	A

Attachment 6

LRA Section: 3.3.2.1.24 and Table 3.3.2-24

LRA Page Number(s): 3.3-30 through 3.3-32, and 3.3-292 through 3.3-314

References: Applicant Initiated

Description of Change: Section 3.3.2.1.24 and Table 3.3.2-24 are revised to:

- Corrected editorial errors in Section 3.3.2.1.24 to reflect aging management programs and aging effects requiring management to align with Table 3.3.2-24.
- Provide additional detail on the materials susceptible to selective leaching.
- Incorporate a new aging management program, Plant-Specific Periodic Inspections for Selective Leaching Program, which is being developed to manage the material/environment combinations where selective leaching has occurred.
- In LRA Table is 3.3.2-24, added ductile iron to the component type names to distinguish between Gray Cast Iron and Ductile Iron. Previously, ductile iron was identified by searching the Material column for Gray Cast Iron and reading the custom note, for example 331.

Note: Prior changes to Section 3.3.2.1.24 and Table 3.3.2-24 made by PNPP Licensing letter L-24-020 are included but not shown as a change here.

PNPP LRA Chapter 3, Section 3.3.2.1.24, Page 3.3-31 and 3.3-32, is revised as follows:

3.3.2.1.24 Fire Protection

Materials

Fire Protection system components are constructed of the following materials:

- Aluminum
- Copper alloy <15% Zn
- Copper alloy >15% Zn
- Fiberglass
- Glass
- Gray cast iron
- Gray cast iron with internal coating/lining
- Polymers

- Stainless steel
- Steel

Environments

Fire Protection system components are exposed to the following environments:

- Air – indoor, uncontrolled
- Air – outdoor
- Closed-cycle cooling water
- Condensation
- Diesel exhaust
- Fuel oil
- Gas
- Lubricating oil
- Raw water
- Soil

Aging Effects Requiring Management

The following aging effects associated with the Fire Protection system require management:

- Change in mechanical properties **(cracking, loss of strength),** Blistering
- Cracking
- Cumulative fatigue damage
- Flow blockage
- Loss of coating or lining integrity
- Loss of material
- Loss of preload
- Reduction of heat transfer

Aging Management Programs

The following aging management programs manage the effects of aging on FireProtection system components:

- Bolting Integrity (B.2.7)
- Buried and Underground Piping and Tanks (B.2.8)

- External Surfaces Monitoring of Mechanical Components (B.2.18)
- Fire Protection (B.2.20)
- Fire Water System (B.2.21)
- Fuel Oil Chemistry (B.2.23)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.25)
- Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B.2.27)
- **Lubricating Oil Analysis (B.2.28)**
- **Plant-Specific Periodic Inspections for Selective Leaching (B.2.45)**
- One-Time Inspection (B.2.35)
- Selective Leaching (B.2.42)
- TLAA

PNPP LRA Table 3.3.2-24, Pages 3.3-292 through 3.3-314, is revised as follows:

Table 3.3.2-24
Auxiliary Systems – Fire Protection
Summary of Aging Management Evaluation

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
1	Bolting	Leakage boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	Bolting Integrity	VII.I.AP-125	3.3.1-12	B
2	Bolting	Leakage boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of preload	Bolting Integrity	VII.I.AP-124	3.3.1-15	B
3	Bolting	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	Bolting Integrity	VII.I.AP-125	3.3.1-12	B
4	Bolting	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of preload	Bolting Integrity	VII.I.AP-124	3.3.1-15	B
5	Bolting	Pressure boundary	Steel	Raw water (Ext)	Loss of material	Bolting Integrity	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	E
6	Bolting	Pressure boundary	Steel	Raw water (Ext)	Loss of preload	Bolting Integrity	VII.I.AP-264	3.3.1-15	B
7	Bolting	Pressure boundary	Steel	Soil (Ext)	Loss of material	Buried and Underground Piping and Tanks	VII.I.AP-241	3.3.1-109	B
8	Bolting	Pressure boundary	Steel	Soil (Ext)	Loss of preload	Bolting Integrity	VII.I.AP-242	3.3.1-14	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
9	Flame arrestor	Pressure boundary	Aluminum	Air – indoor, uncontrolled (Int)	None	None	VII.J.AP-135	3.3.1-113	A
10	Flame arrestor	Pressure boundary	Aluminum	Air – outdoor (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.AP-256	3.3.1-81	A
11	Flame arrestor	Pressure boundary	Copper alloy >15% Zn	Air – indoor, uncontrolled (Int)	None	None	VII.J.AP-144	3.3.1-114	A
12	Flame arrestor	Pressure boundary	Copper alloy >15% Zn	Air – outdoor (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.AP-159	3.3.1-81	A
13	Flexible hose	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
14	Flexible hose	Pressure boundary	Stainless steel	Diesel exhaust (Int)	Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.H2.AP-128	3.3.1-83	A
15	Flexible hose	Pressure boundary	Stainless steel	Diesel exhaust (Int)	Cumulative fatigue damage	TLAA	N/A	N/A	H, 337

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
16	Flexible hose	Pressure boundary	Stainless steel	Diesel exhaust (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.H2.AP-104	3.3.1-88	A
17	Foam chamber (Discharge outlet)	Pressure boundary	Steel	Air – outdoor (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-78	3.3.1-78	A
18	Foam chamber (Discharge outlet)	Pressure boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	D
19	Heat exchanger (Diesel fire pump HX channel)	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	Fire Water System	VII.I.A-77	3.3.1-78	E
20	Heat exchanger (Diesel fire pump HX channel)	Pressure boundary	Steel	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	D
21	Heat exchanger (Diesel fire pump HX channel)	Pressure boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	D
22	Heat exchanger (Diesel fire pump HX shell)	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	Fire Water System	VII.I.A-77	3.3.1-78	E

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
23	Heat exchanger (Diesel fire pump HX shell)	Pressure boundary	Steel	Closed-cycle cooling water (Int)	Loss of material	Fire Water System	VII.C2.AP-189	3.3.1-46	E
24	Heat exchanger (Diesel fire pump HX tube)	Heat transfer, Pressure boundary	Copper alloy <15% Zn	Closed-cycle cooling water (Ext)	Loss of material	Fire Water System	VII.F1.AP-203	3.3.1-46	E
25	Heat exchanger (Diesel fire pump HX tube)	Heat transfer, Pressure boundary	Copper alloy <15% Zn	Closed-cycle cooling water (Ext)	Reduction of heat transfer	Fire Water System	VII.C2.AP-205	3.3.1-50	E
26	Heat exchanger (Diesel fire pump HX tube)	Heat transfer, Pressure boundary	Copper alloy <15% Zn	Raw water (Int)	Flow blockage	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	D
27	Heat exchanger (Diesel fire pump HX tube)	Heat transfer, Pressure boundary	Copper alloy <15% Zn	Raw water (Int)	Loss of material	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	D
28	Heat exchanger (Diesel fire pump HX tube)	Heat transfer, Pressure boundary	Copper alloy <15% Zn	Raw water (Int)	Reduction of heat transfer	Fire Water System	VII.C1.A-72	3.3.1-42	E, 304
29	Muffler	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
30	Muffler	Pressure boundary	Stainless steel	Diesel exhaust (Int)	Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.H2.AP-128	3.3.1-83	A
31	Muffler	Pressure boundary	Stainless steel	Diesel exhaust (Int)	Cumulative fatigue damage	TLAA	N/A	N/A	H, 337
32	Muffler	Pressure boundary	Stainless steel	Diesel exhaust (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.H2.AP-104	3.3.1-88	A
33	Orifice	Flow restriction, Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
34	Orifice	Flow restriction, Pressure boundary	Stainless steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-55 (LR-ISG-2012-02)	3.3.1-66	B
35	Orifice	Flow restriction, Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
36	Orifice	Flow restriction, Pressure boundary	Steel	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
37	Orifice	Flow restriction, Pressure boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
38	Orifice	Leakage boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
39	Orifice	Leakage boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
40	Piping	Leakage boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
41	Piping	Leakage boundary	Stainless steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-55 (LR-ISG-2012-02)	3.3.1-66	B
42	Piping	Leakage boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
43	Piping	Leakage boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
44	Piping	Leakage boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-400 (LR-ISG-2012-02)	3.3.1-127	E
45	Piping	Pressure boundary	Copper alloy <15% Zn	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-144	3.3.1-114	A

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
46	Piping	Pressure boundary	Copper alloy <15% Zn	Fuel oil (Int)	Loss of material	Fuel Oil Chemistry and One-Time Inspection	VII.G.AP-132	3.3.1-69	A
47	Piping	Pressure boundary	Copper alloy <15% Zn	Gas (Int)	None	None	VII.J.AP-9	3.3.1-114	A
48	Piping	Pressure boundary	Fiberglass	Raw water (Int)	Change in mechanical properties (cracking, loss of strength), Blistering	Fire Water System	VII.C1.AP-238	3.3.1-30x	H
49	Piping	Pressure boundary	Fiberglass	Raw water (Int)	Flow Blockage	Fire Water System	VII.C1.AP-238	3.3.1-30x	H, 341
50	Piping	Pressure boundary	Fiberglass	Soil (Ext)	Change in mechanical properties (cracking, loss of strength), Blistering	Buried and Underground Piping and Tanks	VII.C1.AP-176	3.3.1-104	H
51	Piping	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
52	Piping	Pressure boundary	Stainless steel	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-55 (LR-ISG-2012-02)	3.3.1-66	B
53	Piping	Pressure boundary	Stainless steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-55 (LR-ISG-2012-02)	3.3.1-66	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
54	Piping	Pressure boundary	Stainless steel	Soil (Ext)	Cracking	Buried and Underground Piping and Tanks	VII.C3.A-401 (LR-ISG-2012-02)	3.3.1-128	E
55	Piping	Pressure boundary	Stainless steel	Soil (Ext)	Loss of material	Buried and Underground Piping and Tanks	VII.C1.AP-137 (LR-ISG-2011-03)	3.3.1-107	B
56	Piping	Pressure boundary	Steel	Air – indoor, uncontrolled (Int)	Flow blockage	Fire Water System	VII.G.A-404 (LR-ISG-2012-02)	3.3.1-131	B
57	Piping	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
58	Piping	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	Fire Protection	VII.G.AP-150	3.3.1-58	A
59	Piping	Pressure boundary	Steel	Air – indoor, uncontrolled (Int)	Loss of material	Fire Water System	VII.G.A-404 (LR-ISG-2012-02)	3.3.1-131	B
60	Piping	Pressure boundary	Steel	Air – indoor, uncontrolled (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	V.D2.E-29	3.2.1-44	A
61	Piping	Pressure boundary	Steel	Air – outdoor (Int)	Flow blockage	Fire Water System	VII.G.A-404 (LR-ISG-2012-02)	3.3.1-131	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
62	Piping	Pressure boundary	Steel	Air – outdoor (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-78	3.3.1-78	A
63	Piping	Pressure boundary	Steel	Air – outdoor (Ext)	Loss of material	Fire Protection	VII.I.A-78	3.3.1-78	E
64	Piping	Pressure boundary	Steel	Air – outdoor (Int)	Loss of material	Fire Water System	VII.G.A-404 (LR-ISG-2012-02)	3.3.1-131	B
65	Piping	Pressure boundary	Steel	Closed-cycle cooling water (Int)	Loss of material	Fire Water System	VII.C2.AP-202	3.3.1-45	E
66	Piping	Pressure boundary	Steel	Diesel exhaust (Int)	Cumulative fatigue damage	TLAA	N/A	N/A	H, 337
67	Piping	Pressure boundary	Steel	Diesel exhaust (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.H2.AP-104	3.3.1-88	A
68	Piping	Pressure boundary	Steel	Fuel oil (Int)	Loss of material	Fuel Oil Chemistry and One-Time Inspection	VII.H1.AP-105	3.3.1-70	A
69	Piping	Pressure boundary	Steel	Gas (Int)	None	None	VII.J.AP-6	3.3.1-121	A

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
70	Piping	Pressure boundary	Steel	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
71	Piping	Pressure boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
72	Piping	Pressure boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-400 (LR-ISG-2012-02)	3.3.1-127	E
73	Piping	Pressure boundary	Steel	Soil (Ext)	Loss of material	Buried and Underground Piping and Tanks	VII.G.AP-198 (LR-ISG-2011-03)	3.3.1-106	B
74	Piping	Pressure boundary, Flow restriction	Copper alloy <15% Zn	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-144	3.3.1-114	A
75	Piping	Pressure boundary, Flow restriction	Copper alloy <15% Zn	Raw water (Int)	Loss of material	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B
76	Piping - Ductile Iron	Leakage boundary	Gray cast iron	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A, 331
77	Piping - Ductile Iron	Leakage boundary	Gray cast iron	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B, 331
78	Piping - Ductile Iron	Leakage boundary	Gray cast iron	Raw water (Int)	Loss of material	Selective Leaching	VII.G.A-51	3.3.1-72	B, 331

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
79	Piping - Ductile Iron	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled (Int)	Flow blockage	Fire Water System	VII.G.A-404 (LR-ISG-2012-02)	3.3.1-131	B, 331
80	Piping - Ductile Iron	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A, 331
81	Piping - Ductile Iron	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled (Int)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A, 331
82	Piping - Ductile Iron	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled (Int)	Loss of material	Fire Water System	VII.G.A-404 (LR-ISG-2012-02)	3.3.1-131	B, 331
83	Piping - Ductile Iron	Pressure boundary	Gray cast iron	Air – outdoor (Int)	Flow blockage	Fire Water System	VII.G.A-404 (LR-ISG-2012-02)	3.3.1-131	B, 331, 340
84	Piping - Ductile Iron	Pressure boundary	Gray cast iron	Air – outdoor (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-78	3.3.1-78	A, 331
85	Piping - Ductile Iron	Pressure boundary	Gray cast iron	Air – outdoor (Int)	Loss of material	Fire Water System	VII.G.A-404 (LR-ISG-2012-02)	3.3.1-131	B, 331
86	Piping - Ductile Iron	Pressure boundary	Gray cast iron	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B, 331, 340

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
87	Piping - Ductile Iron	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B, 331
88	Piping - Ductile Iron	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Selective Leaching	VII.G.A-51	3.3.1-72	B, 331
89	Piping - Ductile Iron	Pressure boundary	Gray cast iron	Soil (Ext)	Loss of material	Buried and Underground Piping and Tanks	VII.G.AP-198 (LR-ISG-2011-03)	3.3.1-106	B, 331
90	Piping - Ductile Iron	Pressure boundary	Gray cast iron	Soil (Ext)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-02	3.3.1-72	~~B, 331~~ E, 331
91	Piping - Ductile Iron	Pressure boundary	Gray cast iron with internal coating/lining	Raw water (Int)	Loss of coating or lining integrity	Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks	VII.G.A-416 (LR-ISG-2013-01)	3.3.1-138	B, 331
92	Piping - Ductile Iron	Pressure boundary	Gray cast iron with internal coating/lining	Raw water (Int)	Loss of material	Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks	VII.G.A-415 (LR-ISG-2013-01)	3.3.1-140	B, 331

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
~~68~~	~~Piping~~	~~Pressure boundary~~	~~Gray cast iron with internal coating /lining~~	~~Raw water (Int)~~	~~Loss of material~~	~~Selective Leaching~~	~~VII.G.A-51~~	~~3.3.1-72~~	~~A, 331~~
93	Pump casing	Leakage boundary	Gray cast iron	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
94	Pump casing	Leakage boundary	Gray cast iron	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
95	Pump casing	Leakage boundary	Gray cast iron	Raw water (Int)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-51	3.3.1-72	~~B~~ E
96	Pump casing	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
97	Pump casing	Pressure boundary	Gray cast iron	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
98	Pump casing	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
99	Pump casing	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-51	3.3.1-72	~~B~~ E
100	Pump casing (Column)	Pressure boundary	Steel	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
101	Pump casing (Column)	Pressure boundary	Steel	Raw water (Ext)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
102	Pump casing (Column)	Pressure boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
103	Pump casing (Diesel fire pump fuel oil)	Pressure boundary	Copper alloy >15% Zn	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-144	3.3.1-114	A
104	Pump casing (Diesel fire pump fuel oil)	Pressure boundary	Copper alloy >15% Zn	Fuel oil (Int)	Cracking	Fuel Oil Chemistry and One-Time Inspection	N/A	N/A	H, 336
105	Pump casing (Diesel fire pump fuel oil)	Pressure boundary	Copper alloy >15% Zn	Fuel oil (Int)	Loss of material	Fuel Oil Chemistry and One-Time Inspection	VII.G.AP-132	3.3.1-69	A
106	Pump casing (Diesel fire pump fuel oil)	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
107	Pump casing (Diesel fire pump fuel oil)	Pressure boundary	Steel	Fuel oil (Int)	Loss of material	Fuel Oil Chemistry and One-Time Inspection	VII.H1.AP-105	3.3.1-70	A
108	Pump casing (Diesel fire pump jacket water)	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
109	Pump casing (Diesel fire pump jacket water)	Pressure boundary	Steel	Closed-cycle cooling water (Int)	Loss of material	Fire Water System	VII.C2.AP-202	3.3.1-45	E
110	Pump casing (Suction bell)	Pressure boundary	Gray cast iron with internal coating/lining	Raw water (Int)	Loss of coating or lining integrity	Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks	VII.G.A-416 (LR-ISG-2013-01)	3.3.1-138	B
111	Pump casing (Suction bell)	Pressure boundary	Gray cast iron with internal coating/lining	Raw water (Ext)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
112	Pump casing (Suction bell)	Pressure boundary	Gray cast iron with internal coating/lining	Raw water (Int)	Loss of material	Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks	VII.G.A-414 (LR-ISG-2013-01)	3.3.1-139	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
113	Pump casing (Suction bell)	Pressure boundary	Gray cast iron with internal coating/lining	Raw water (Int)	Loss of material	Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks	VII.G.A-415 (LR-ISG-2013-01)	3.3.1-140	B
114	Pump casing (Suction bell)	Pressure boundary	Gray cast iron with internal coating/lining	Raw water (Ext)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-51	3.3.1-72	~~B~~ E
115	Pump casing (Suction strainer element)	Filtration	Copper alloy <15% Zn	Raw water (Ext)	Loss of material	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B, 342
116	Pump casing (Suction strainer element)	Filtration	Stainless steel	Raw water (Ext)	Loss of material	Fire Water System	VII.G.A-55 (LR-ISG-2012-02)	3.3.1-66	B, 330
117	Sight glass	Leakage boundary	Polymers	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-268	3.3.1-119	A, 310
118	Sight glass	Leakage boundary	Polymers	Raw water (Int)	None	None	N/A	N/A	G, 310
119	Sight glass	Pressure boundary	Glass	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-14	3.3.1-117	A

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
120	Sight glass	Pressure boundary	Glass	Raw water (Int)	None	None	VII.J.AP-50	3.3.1-117	A
121	Sight glass	Pressure boundary	Polymers	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-268	3.3.1-119	A, 310
122	Sight glass	Pressure boundary	Polymers	Raw water (Int)	None	None	N/A	N/A	G, 310
123	Sight glass (Body)	Leakage boundary	Gray cast iron	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
124	Sight glass (Body)	Leakage boundary	Gray cast iron	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
125	Sight glass (Body)	Leakage boundary	Gray cast iron	Raw water (Int)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-51	3.3.1-72	~~B~~ E
126	Sight glass (Body)	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
127	Sight glass (Body)	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
128	Sight glass (Body)	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-51	3.3.1-72	~~B~~ E
129	Sight glass (Body)	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
130	Sight glass (Body)	Pressure boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
131	Spray nozzle	Direct flow	Copper alloy >15% Zn	Air – outdoor (Int)	Flow blockage	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B
132	Spray nozzle	Direct flow	Copper alloy >15% Zn	Air – outdoor (Int)	Loss of material	Fire Water System	VII.G.A-404 (LR-ISG-2012-02)	3.3.1-131	B
133	Spray nozzle	Direct flow	Copper alloy >15% Zn	Air – outdoor (Ext)	Loss of material	Fire Water System	VII.I.AP-159	3.3.1-81	E
134	Sprinkler head	Direct flow	Copper alloy <15% Zn	Air – indoor, uncontrolled (Int)	Flow blockage	Fire Water System	VII.G.A-403 (LR-ISG-2012-02)	3.3.1-130	B
135	Sprinkler head	Direct flow	Copper alloy <15% Zn	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-144	3.3.1-114	A

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
136	Sprinkler head	Direct flow	Copper alloy <15% Zn	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-403 (LR-ISG-2012-02)	3.3.1-130	B
137	Sprinkler head	Direct flow	Copper alloy <15% Zn	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-403 (LR-ISG-2012-02)	3.3.1-130	B
138	Sprinkler head	Direct flow	Copper alloy >15% Zn	Air – indoor, uncontrolled (Int)	Flow blockage	Fire Water System	VII.G.A-403 (LR-ISG-2012-02)	3.3.1-130	B
139	Sprinkler head	Direct flow	Copper alloy >15% Zn	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-144	3.3.1-114	A
140	Sprinkler head	Direct flow	Copper alloy >15% Zn	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-403 (LR-ISG-2012-02)	3.3.1-130	B
141	Sprinkler head	Direct flow	Copper alloy >15% Zn	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-403 (LR-ISG-2012-02)	3.3.1-130	B
142	Sprinkler head	Direct flow	Copper alloy >15% Zn	Raw water (Int)	Loss of material	Selective Leaching	VII.G.A-47	3.3.1-72	B
143	Strainer body	Pressure boundary	Copper alloy <15% Zn	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-144	3.3.1-114	A

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
144	Strainer body	Pressure boundary	Copper alloy <15% Zn	Raw water (Int)	Flow blockage	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B
145	Strainer body	Pressure boundary	Copper alloy <15% Zn	Raw water (Int)	Loss of material	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B
146	Strainer body	Pressure boundary	Copper alloy >15% Zn	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-144	3.3.1-114	A
147	Strainer body	Pressure boundary	Copper alloy >15% Zn	Raw water (Int)	Flow blockage	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B
148	Strainer body	Pressure boundary	Copper alloy >15% Zn	Raw water (Int)	Loss of material	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B
149	Strainer body	Pressure boundary	Copper alloy >15% Zn	Raw water (Int)	Loss of material	Selective Leaching	VII.G.A-47	3.3.1-72	B
150	Strainer body	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
151	Strainer body	Pressure boundary	Gray cast iron	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
152	Strainer body	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
153	Strainer body	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-51	3.3.1-72	~~B~~ E
154	Strainer body	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
155	Strainer body	Pressure boundary	Steel	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
156	Strainer body	Pressure boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
157	Tank	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
158	Tank	Pressure boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	D
159	Tank (CO2)	Pressure boundary	Steel	Condensation (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.G.A-405 (LR-ISG-2012-02)	3.3.1-132	A

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
160	Tank (CO2)	Pressure boundary	Steel	Gas (Int)	None	None	VII.J.AP-6	3.3.1-121	C
161	Tank (Fuel oil)	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
162	Tank (Fuel oil)	Pressure boundary	Steel	Fuel oil (Int)	Loss of material	Fuel Oil Chemistry and One-Time Inspection	VII.H1.AP-105	3.3.1-70	A
163	Tank (Pressure maintenance)	Leakage boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
164	Tank (Pressure maintenance)	Leakage boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	D
165	Tank (Retarding chamber)	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
166	Tank (Retarding chamber)	Pressure boundary	Gray cast iron	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
167	Tank (Retarding chamber)	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
168	Tank (Retarding chamber)	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-51	3.3.1-72	~~B~~ E
169	Valve body	Leakage boundary	Copper alloy <15% Zn	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-144	3.3.1-114	A
170	Valve body	Leakage boundary	Copper alloy <15% Zn	Raw water (Int)	Loss of material	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B
171	Valve body	Leakage boundary	Copper alloy >15% Zn	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-144	3.3.1-114	A
172	Valve body	Leakage boundary	Copper alloy >15% Zn	Raw water (Int)	Loss of material	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B
173	Valve body	Leakage boundary	Copper alloy >15% Zn	Raw water (Int)	Loss of material	Selective Leaching	VII.G.A-47	3.3.1-72	B
174	Valve body	Leakage boundary	Gray cast iron	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
175	Valve body	Leakage boundary	Gray cast iron	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
176	Valve body	Leakage boundary	Gray cast iron	Raw water (Int)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-51	3.3.1-72	~~B~~ E
177	Valve body	Leakage boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
178	Valve body	Leakage boundary	Stainless steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-55 (LR-ISG-2012-02)	3.3.1-66	B
179	Valve body	Pressure boundary	Copper alloy <15% Zn	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-144	3.3.1-114	A
180	Valve body	Pressure boundary	Copper alloy <15% Zn	Air – outdoor (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.AP-159	3.3.1-81	A
181	Valve body	Pressure boundary	Copper alloy <15% Zn	Gas (Int)	None	None	VII.J.AP-9	3.3.1-114	A
182	Valve body	Pressure boundary	Copper alloy <15% Zn	Raw water (Int)	Flow blockage	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B
183	Valve body	Pressure boundary	Copper alloy <15% Zn	Raw water (Int)	Loss of material	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
184	Valve body	Pressure boundary	Copper alloy >15% Zn	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-144	3.3.1-114	A
185	Valve body	Pressure boundary	Copper alloy >15% Zn	Fuel oil (Int)	Cracking	Fuel Oil Chemistry and One-Time Inspection	N/A	N/A	H, 336
186	Valve body	Pressure boundary	Copper alloy >15% Zn	Fuel oil (Int)	Loss of material	Fuel Oil Chemistry and One-Time Inspection	VII.G.AP-132	3.3.1-69	A
187	Valve body	Pressure boundary	Copper alloy >15% Zn	Raw water (Int)	Flow blockage	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B
188	Valve body	Pressure boundary	Copper alloy >15% Zn	Raw water (Int)	Loss of material	Fire Water System	VII.G.AP-197 (LR-ISG-2012-02)	3.3.1-64	B
189	Valve body	Pressure boundary	Copper alloy >15% Zn	Raw water (Int)	Loss of material	Selective Leaching	VII.G.A-47	3.3.1-72	B
190	Valve body	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
191	Valve body	Pressure boundary	Gray cast iron	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
192	Valve body	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
193	Valve body	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-51	3.3.1-72	~~B~~ E
194	Valve body	Pressure boundary	Gray cast iron	Soil (Ext)	Loss of material	Buried and Underground Piping and Tanks	VII.G.AP-198 (LR-ISG-2011-03)	3.3.1-106	B
195	Valve body	Pressure boundary	Gray cast iron	Soil (Ext)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-02	3.3.1-72	~~B~~ E
196	Valve body	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
197	Valve body	Pressure boundary	Stainless steel	Gas (Int)	None	None	VII.J.AP-22	3.3.1-120	A
198	Valve body	Pressure boundary	Stainless steel	Lubricating oil (Int)	Loss of material	Lubricating Oil Analysis and One-Time Inspection	VII.G.AP-138	3.3.1-100	A
199	Valve body	Pressure boundary	Stainless steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-55 (LR-ISG-2012-02)	3.3.1-66	B

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
200	Valve body	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
201	Valve body	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	Fire Protection	VII.G.AP-150	3.3.1-58	A
202	Valve body	Pressure boundary	Steel	Air – outdoor (Ext)	Loss of material	Fire Protection	VII.I.A-78	3.3.1-78	E
203	Valve body	Pressure boundary	Steel	Gas (Int)	None	None	VII.J.AP-6	3.3.1-121	A
204	Valve body	Pressure boundary	Steel	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
205	Valve body	Pressure boundary	Steel	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
206	Valve body - Ductile Iron	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A, 331
207	Valve body - Ductile Iron	Pressure boundary	Gray cast iron	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B, 331, 340
208	Valve body - Ductile Iron	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B, 331

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
209	Valve body - Ductile Iron	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Selective Leaching	VII.G.A-51	3.3.1-72	B, 331
210	Valve body (Hydrant)	Pressure boundary	Gray cast iron	Air – outdoor (Ext)	Loss of material	Fire Water System	VII.G.AP-149	3.3.1-63	B
211	Valve body (Hydrant)	Pressure boundary	Gray cast iron	Raw water (Int)	Flow blockage	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
212	Valve body (Hydrant)	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Fire Water System	VII.G.A-33 (LR-ISG-2012-02)	3.3.1-64	B
213	Valve body (Hydrant)	Pressure boundary	Gray cast iron	Raw water (Int)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-51	3.3.1-72	~~B~~ E
214	Valve body (Hydrant)	Pressure boundary	Gray cast iron	Soil (Ext)	Loss of material	Buried and Underground Piping and Tanks	VII.G.AP-198 (LR-ISG-2011-03)	3.3.1-106	B
215	Valve body (Hydrant)	Pressure boundary	Gray cast iron	Soil (Ext)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.G.A-02	3.3.1-72	~~B~~ E
~~210~~	~~Valve body (Hydrant)~~	~~Pressure boundary~~	~~Gray cast iron~~	~~Air – outdoor (Ext)~~	~~Loss of material~~	~~Fire Water System~~	~~VII.G.AP-149~~	~~3.3.1-63~~	~~B~~

Table 3.3.2-24 – Fire Protection System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
~~211~~	~~Valve body (Hydrant)~~	~~Pressure boundary~~	~~Gray cast iron~~	~~Raw water (Int)~~	~~Flow blockage~~	~~Fire Water System~~	~~VII.G.A-33 (LR-ISG-2012-02)~~	~~3.3.1-64~~	~~B~~
~~212~~	~~Valve body (Hydrant)~~	~~Pressure boundary~~	~~Gray cast iron~~	~~Raw water (Int)~~	~~Loss of material~~	~~Fire Water System~~	~~VII.G.A-33 (LR-ISG-2012-02)~~	~~3.3.1-64~~	~~B~~
~~213~~	~~Valve body (Hydrant)~~	~~Pressure boundary~~	~~Gray cast iron~~	~~Raw water (Int)~~	~~Loss of material~~	~~Periodic Inspections for Selective Leaching~~ ~~Selective Leaching~~	~~VII.G.A-51~~	~~3.3.1-72~~	~~B~~ ~~E~~
~~214~~	~~Valve body (Hydrant)~~	~~Pressure boundary~~	~~Gray cast iron~~	~~Soil (Ext)~~	~~Loss of material~~	~~Buried and Underground Piping and Tanks~~	~~VII.G.AP-198 (LR-ISG-2011-03)~~	~~3.3.1-106~~	~~B~~
~~215~~	~~Valve body (Hydrant)~~	~~Pressure boundary~~	~~Gray cast iron~~	~~Soil (Ext)~~	~~Loss of material~~	~~Periodic Inspections for Selective Leaching~~ ~~Selective Leaching~~	~~VII.G.A-02~~	~~3.3.1-72~~	~~B~~ ~~E~~

Attachment 7

LRA Section: 3.3.2.1.47 and Table 3.3.2-47

LRA Page Number(s): 3.3-51, 3.3-401 through 3.3-404

References: Applicant Initiated

Description of Change: A new aging management program, Plant-Specific Periodic Inspections for Selective Leaching Program, will manage the selective leaching for Gray cast iron components exposed to Raw water since selective leaching has occurred in a different system for this material environment combination. There are no ductile iron components in this system subject to aging management. Prior changes to Table 3.3.2-47 made by PNPP LRA Supplement 2 (Letter L-24-020) are included but not shown as a change here.

PNPP LRA Section 3.3.2.1.47 Potable Water Supply System, Page 3.3-51 is revised as follows:

Materials

Potable Water Supply system components are constructed of the following materials:

- Copper alloy <15% Zn
- Gray cast iron
- Stainless steel
- Steel
- Steel with internal coating/lining

Environments

Potable Water Supply system components are exposed to the following environments:

- Air – indoor, uncontrolled
- Raw water

Aging Effects Requiring Management

The following aging effects associated with the Potable Water Supply system require management:

- Loss of coating or lining integrity

- Loss of material
- Loss of preload

Aging Management Programs

The following aging management programs manage the effects of aging on Potable Water Supply system components:

- Bolting Integrity (B.2.7)
- External Surfaces Monitoring of Mechanical Components (B.2.18)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.25)
- Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B.2.27)
- **Plant-Specific Periodic Inspections for Selective Leaching (B.2.45)**
- Selective Leaching (B.2.42)

PNPP LRA Table 3.3.2-47, Page 3.3-404, is revised as follows:

Table 3.3.2-47
Auxiliary Systems – Potable Water Supply
Summary of Aging Management Evaluation

Table 3.3.2-47 - Potable Water Supply System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801Item**	**Table 1Item**	**Notes**
1	Bolting	Leakage boundary	Steel	Air – indoor, uncontrolled(Ext)	Loss of material	Bolting Integrity	VII.I.AP-125	3.3.1-12	B
2	Bolting	Leakage boundary	Steel	Air – indoor, uncontrolled(Ext)	Loss of preload	Bolting Integrity	VII.I.AP-124	3.3.1-15	B
3	Eyewash station	Leakage boundary	Steel	Air – indoor, uncontrolled(Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
4	Eyewash station	Leakage boundary	Steel	Raw water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-270	3.3.1-88	A
5	Flexible hose	Leakage boundary	Stainless steel	Air – indoor, uncontrolled(Ext)	None	None	VII.J.AP-17	3.3.1-120	A
6	Flexible hose	Leakage boundary	Stainless steel	Raw water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-270	3.3.1-88	A

Table 3.3.2-47 - Potable Water Supply System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Managemen tProgram**	**NUREG-1801Item**	**Table 1Item**	**Notes**
7	Piping	Leakage boundary	Copper alloy <15% Zn	Air – indoor, uncontrolled(Ext)	None	None	VII.J.AP-144	3.3.1-114	A
8	Piping	Leakage boundary	Copper alloy <15% Zn	Raw water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-271	3.3.1-93	A
9	Piping	Leakage boundary	Steel	Air – indoor, uncontrolle d(Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
10	Piping	Leakage boundary	Steel	Raw water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-270	3.3.1-88	A
11	Piping	Leakage boundary	Steel with internal coating/ lining	Air – indoor, uncontrol led(Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.D.A-80	3.3.1-78	A, 313
12	Piping	Leakage boundary	Steel with internal coating/ lining	Raw water (Int)	Loss of coating or lining integrity	Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks	VII.E5.A-416 (LR-ISG-2013-01)	3.3.1-138	B, 313

Table 3.3.2-47 - Potable Water Supply System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Managemen tProgram**	**NUREG-1801Item**	**Table 1Item**	**Notes**
13	Piping	Leakage boundary	Steel with internal coating/ lining	Raw water (Int)	Loss of material	Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks	VII.E5.A-414 (LR-ISG-2013-01)	3.3.1-139	B, 312
14	Pump casing	Leakage boundary	Copper alloy <15% Zn	Air – indoor, uncontrol led(Ext)	None	None	VII.J.AP-144	3.3.1-114	A
15	Pump casing	Leakage boundary	Copper alloy <15% Zn	Raw water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-271	3.3.1-93	A
16	Tank (Water heater lining)	Leakage boundary	Copper alloy <15% Zn	Raw water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-271	3.3.1-93	A
17	Tank (Water heater)	Leakage boundary	Steel	Air – indoor, uncontrol led(Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
18	Valve body	Leakage boundary	Copper alloy <15% Zn	Air – indoor, uncontrol led(Ext)	None	None	VII.J.AP-144	3.3.1-114	A

Table 3.3.2-47 - Potable Water Supply System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Managemen tProgram**	**NUREG-1801Item**	**Table 1Item**	**Notes**
19	Valve body	Leakage boundary	Copper alloy <15% Zn	Raw water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-271	3.3.1-93	A
20	Valve body	Leakage boundary	Gray cast iron	Air – indoor, uncontrol led(Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
21	Valve body	Leakage boundary	Gray cast iron	Raw water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-270	3.3.1-88	A
22	Valve body	Leakage boundary	Gray cast iron	Raw water (Int)	Loss of material	Plant-Specific Periodic Inspections for Selective Leaching ~~Selective Leaching~~	VII.C1.A-51 (LR-ISG-2012-02)	3.3.1-72	~~B~~ E

Attachment 8

LRA Section: 3.3.2.1.45 and Table 3.3.2-45

LRA Page Number(s): 3.3-49, 3.3-50, 3.3-392 through 3.3-396

References: Applicant Initiated

Description of Change: Attachment 3 of this supplement (Letter L-24-178) identifies new component type and system intended functions. A new component type Flow elements and material environment combinations have been identified for this system during the AMR review process. Additionally, the aging effects are being managed by an existing aging management program that wasn't previously relied upon for this system. These changes are shown in LRA Section 3.3.2.1.45 and LRA Table 3.3.2-45. The discussion text for the affected line items in LRA Table 3.3.1 were reviewed with no recommended changes. Prior changes to LRA Table 3.3.2-45 made by PNPP Supplement 2 (Letter L-24-020) are included but not shown as a change here.

PNPP LRA Section 3.3.2.1.45 Plant Radiation Monitoring and Process Monitoring and Post-Accident Radiation Monitoring, Page 3.3-49, is revised as follows:

Materials

Plant Radiation Monitoring and Process Monitoring and Post Accident Radiation Monitoring systems components are constructed of the following materials:

- Copper alloy <15% Zn
- Gray cast iron
- Stainless steel
- Steel

Environments

Plant Radiation Monitoring and Process Monitoring and Post Accident Radiation Monitoring systems components are exposed to the following environments:

- Air – indoor, uncontrolled
- Closed-cycle cooling water
- Raw water
- Waste water

Aging Effects Requiring Management

The following aging effects associated with the Plant Radiation Monitoring and Process Monitoring and Post Accident Radiation Monitoring systems require management:

- Loss of material
- Loss of preload

Aging Management Programs

The following aging management programs manage the effects of aging on Plant Radiation Monitoring and Process Monitoring and Post Accident Radiation Monitoring systems components:

- Bolting Integrity (B.2.7)
- Closed Treated Water Systems (B.2.15)
- External Surfaces Monitoring of Mechanical Components (B.2.18)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.25)
- Open-Cycle Cooling Water System (B.2.37)

PNPP LRA Table 3.3.2-45, Page 3.3-392 through 3.3-396, is revised as follows:

Table 3.3.2-45
Auxiliary Systems – Plant Radiation Monitoring and Process Monitoring, and Post Accident Radiation Monitoring
Summary of Aging Management Evaluation

Table 3.3.2-45 - Plant Radiation Monitoring and Process Monitoring, and Post Accident Radiation Monitoring System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
1	Bolting	Leakage boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	Bolting Integrity	VII.I.AP-125	3.3.1-12	B
2	Bolting	Leakage boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of preload	Bolting Integrity	VII.I.AP-124	3.3.1-15	B
3	Bolting	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	Bolting Integrity	VII.I.AP-125	3.3.1-12	B
4	Bolting	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of preload	Bolting Integrity	VII.I.AP-124	3.3.1-15	B
5	Bolting	Structural integrity	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	Bolting Integrity	VII.I.AP-125	3.3.1-12	B
6	Bolting	Structural integrity	Steel	Air – indoor, uncontrolled (Ext)	Loss of preload	Bolting Integrity	VII.I.AP-124	3.3.1-15	B
7	Detector housing	Leakage boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
8	Detector housing	Leakage boundary	Stainless steel	Closed-cycle cooling water (Int)	Loss of material	Closed Treated Water Systems	VII.C2.A-52	3.3.1-49	A

Table 3.3.2-45 - Plant Radiation Monitoring and Process Monitoring, and Post Accident Radiation Monitoring System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
9	Detector housing	Leakage boundary	Stainless steel	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.A-54	3.3.1-40	A
10	Detector housing	Leakage boundary	Stainless steel	Waste water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-278	3.3.1-95	A
11	Detector housing	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Int)	None	None	VII.J.AP-123	3.3.1-120	A
12	Detector housing	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
13	Filter housing	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Int)	None	None	VII.J.AP-123	3.3.1-120	A
14	Filter housing	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
15	Flexible hose	Leakage boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
16	Flexible hose	Leakage boundary	Stainless steel	Closed-cycle cooling water (Int)	Loss of material	Closed Treated Water Systems	VII.C2.A-52	3.3.1-49	A
17	Flexible hose	Leakage boundary	Stainless steel	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.A-54	3.3.1-40	A

Table 3.3.2-45 - Plant Radiation Monitoring and Process Monitoring, and Post Accident Radiation Monitoring System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
18	Flexible hose	Leakage boundary	Stainless steel	Waste water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-278	3.3.1-95	A
19	Flow element	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Int)	None	None	VII.J.AP-123	3.3.1-120	A
20	Flow element	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
21	Flow straightener	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Int)	None	None	VII.J.AP-123	3.3.1-120	A
22	Flow straightener	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
23	Piping	Leakage boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
24	Piping	Leakage boundary	Stainless steel	Closed-cycle cooling water (Int)	Loss of material	Closed Treated Water Systems	VII.C2.A-52	3.3.1-49	A
25	Piping	Leakage boundary	Stainless steel	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.A-54	3.3.1-40	A

Table 3.3.2-45 - Plant Radiation Monitoring and Process Monitoring, and Post Accident Radiation Monitoring System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
26	Piping	Leakage boundary	Stainless steel	Waste water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-278	3.3.1-95	A
27	Piping	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Int)	None	None	VII.J.AP-123	3.3.1-120	A
28	Piping	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
29	Piping	Pressure boundary	Steel	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
30	Piping	Pressure boundary	Steel	Air – indoor, uncontrolled (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	V.D2.E-29	3.2.1-44	A
31	Piping	Structural integrity	Stainless steel	Air – indoor, uncontrolled (Int)	None	None	VII.J.AP-123	3.3.1-120	A
32	Piping	Structural integrity	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
33	Pump casing	Leakage boundary	Copper alloy <15% Zn	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-144	3.3.1-114	A

Table 3.3.2-45 - Plant Radiation Monitoring and Process Monitoring, and Post Accident Radiation Monitoring System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
34	Pump casing	Leakage boundary	Copper alloy <15% Zn	Closed-cycle cooling water (Int)	Loss of material	Closed Treated Water Systems	VII.C2.AP-199	3.3.1-46	A
35	Pump casing	Leakage boundary	Copper alloy <15% Zn	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.AP-196	3.3.1-36	A
36	Pump casing	Leakage boundary	Copper alloy <15% Zn	Waste water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-272	3.3.1-95	A
37	Pump casing	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled (Ext)	Loss of material	External Surfaces Monitoring of Mechanical Components	VII.I.A-77	3.3.1-78	A
38	Pump casing	Pressure boundary	Gray cast iron	Air – indoor, uncontrolled (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	V.D2.E-29	3.2.1-44	A
39	Pump casing	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Int)	None	None	VII.J.AP-123	3.3.1-120	A
40	Pump casing	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
41	Valve body	Leakage boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A

Table 3.3.2-45 - Plant Radiation Monitoring and Process Monitoring, and Post Accident Radiation Monitoring System									
Row	**Component Type**	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
42	Valve body	Leakage boundary	Stainless steel	Closed-cycle cooling water (Int)	Loss of material	Closed Treated Water Systems	VII.C2.A-52	3.3.1-49	A
43	Valve body	Leakage boundary	Stainless steel	Raw water (Int)	Loss of material	Open-Cycle Cooling Water System	VII.C1.A-54	3.3.1-40	A
44	Valve body	Leakage boundary	Stainless steel	Waste water (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	VII.E5.AP-278	3.3.1-95	A
45	Valve body	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Int)	None	None	VII.J.AP-123	3.3.1-120	A
46	Valve body	Pressure boundary	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A
47	Valve body	Structural integrity	Stainless steel	Air – indoor, uncontrolled (Int)	None	None	VII.J.AP-123	3.3.1-120	A
48	Valve body	Structural integrity	Stainless steel	Air – indoor, uncontrolled (Ext)	None	None	VII.J.AP-17	3.3.1-120	A

Place Holder Page - This Attachment is not used.

Attachment 10

LRA Section: Table A.1

LRA Page Number(s): A-7

Reference: Applicant Initiated

Description of Change: The new Plant-Specific Periodic Inspections for Selective Leaching Program monitors for and manages the effects of selective leaching for the following material/environment populations:

- gray cast iron/raw water,
- gray cast iron/soil,
- gray cast iron (ductile iron)/soil

Appendix A for the LRA and Table A.1 is revised to accommodate the new plant specific program.

PNPP LRA Table A.1, Page A-7 is revised as follows:

NOTE: Only those table rows with revised text are included in the following table. Table rows unaffected by these changes are omitted from this attachment.

Table A.1
Correlation of NUREG-1801 and PNPP Aging Management Programs

NUREG-1801 Number	NUREG-1801 Program	PNPP Program	Program Status	LRA Sections
XI.S8	Protective Coating Monitoring and Maintenance Program	Protective Coating Monitoring and Maintenance Program	Existing	A.1.38 B.2.38
XI.E1	Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Non-EQ Insulated Cables and Connections Program	Existing	A.1.34 B.2.34

NUREG-1801 Number	NUREG-1801 Program	PNPP Program	Program Status	LRA Sections
XI.E2	Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits	Non-EQ Instrumentation Circuits Program	New	A.1.33 B.2.33
XI.E3	Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Non-EQ Inaccessible Power Cables Program	Existing	A.1.32 B.2.32
XI.E4	Metal Enclosed Bus	Not applicable. There are no in-scope metal enclosed bus for PNPP	N/A	N/A
XI.E5	Fuse Holders	Fuse Holders	New	A.1.24 B.2.24
XI.E6	Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Non-EQ Electrical Cable Connections Program	New (One-Time)	A.1.31 B.2.31
N/A	N/A	Plant-Specific Periodic Inspections for Selective Leaching Program	New	A.1.45 B.2.45

Attachment 11

LRA Section: A.1.42

LRA Page Number(s): A-40, and A-41

Reference: Applicant Initiated

Description of Change: The purpose of NUREG-1801, XI.M33 is to demonstrate the absence of selective leaching. The program for selective leaching of materials ensures the integrity of the components made of gray cast iron and copper alloys (except for inhibited brass) that contain greater than 15 percent zinc (> 15% Zn) or greater than 8 percent aluminum (>8% Al in the case of aluminum-bronze) exposed to a raw water, closed cooling water, treated water, or ground water environment that may lead to selective leaching of one of the metal components where there has not been previous experience of selective leaching. Program scope states "For materials and environments where selective leaching is currently occurring…, a plant-specific program is required." Plant-specific OE CR-2024-02317 identifies instances of selective leaching occurring at PNPP. As such, LRA Section A.1.42 is revised to reflect use of a new, plant-specific, on-going aging management program for the material/environment combinations where selective leaching has been identified. Note, consistent with is change, a new LRA Section A.1.45 is incorporated via Attachment 12 of this supplement.

PNPP LRA Section A.1.42, Pages A-40 and 41 (as previously modified under L-24-110 Annual Update Attachment 8), is revised as follows:

A.1.42 SELECTIVE LEACHING PROGRAM

The Selective Leaching Program is a new ~~plant-specific~~**condition monitoring aging management** program that will ~~monitor for and manage the effects~~**ensure the integrity of components within the scope** of **license renewal that are susceptible to loss of material due to** selective leaching **by demonstrating the absence of selective leaching**. The **Selective Leaching** ~~p~~**P**rogram ~~for selective leaching of materials~~ will ~~ensure the integrity of the components made of ductile iron, gray cast iron and copper alloys (except for inhibited brass) that contain greater than 15 percent zinc (> 15% Zn) exposed to~~**identify the aging effects of loss of material due to selective leaching for components subject to an environment of** raw water, closed cycle cooling water (CCCW), treated water, waste water, ~~or~~ soil **or condensation**~~that may lead to selective leaching of one of the metal components~~.

Components include piping, heat exchangers, pump casings, sight glasses (body), valve bodies and strainer bodies. The materials of construction for these components that are susceptible to selective leaching are ductile iron, gray cast iron and copper alloys (except for inhibited brass) that contain greater than 15 percent zinc (> 15% Zn). There are no aluminum bronze in-scope components with greater than eight percent aluminum.

The program ~~will include~~ is a one-time visual inspection ~~coupled with either~~**supplemented by** hardness measurement or other mechanical examination techniques such as destructive testing ~~(when the opportunity arises)~~, scraping, or chipping **(where practicable based on component form and configuration) of a representative sample of selected components that may be susceptible to selective leaching**. ~~Periodic selective leaching inspections are conducted on component populations with materials and environments that have exhibited selective leaching at PNPP. Follow-up of unacceptable inspection findings will include an evaluation using the corrective action program and a possible expansion of the inspection sample size and location. Destructive examinations of components to determine the presence and depth of dealloying through-wall thickness are conducted.~~

~~One-time inspections are conducted on a representative sample of the component population and will focus on the bounding or lead components most susceptible to aging due to time in service, severity of operating conditions, and lowest design margin for each population. A representative sample size will be 20%~~**Each group** of **components with the same material/environment combination is considered a separate population.** ~~the~~**Twenty percent of a susceptible component** population ~~(defined as components having the same material and environment combination)~~ with a maximum of 25 ~~components~~**constitutes a representative sample size. Where practical, the representative sample of each of those populations will focus on the bounding or lead components most susceptible to aging due to time in service, severity of operating conditions, and lowest design margin**. Otherwise, a technical justification of the methodology and sample size used for selecting components for ~~the~~**one-time** inspections will be included as part of the program's documentation.

The scope of this program does not include material and environment combinations where selective leaching has occurred and either (1) the component was replaced with the same material or (2) selective leaching is actively occurring. For those material/environment combination populations, a plant specific program will be used.

Follow-up of unacceptable inspection findings will include an evaluation using the corrective action program to determine acceptability of the affected components for further service, and a possible expansion of the inspection sample size and location.

~~According to the GALL Section XI.M33, for materials and environments where selective leaching is currently occurring, a plant specific program is required. PNPP has recently observed selective leaching in valve bodies (hydrants) that are buried (soil external environment), gray cast iron, fire protection components (raw water internal environment). A review of aging management data confirms that material and environment combination is limited to the fire protection system. Thus, the population of buried, gray cast iron and ductile iron, fire protection components are subject to periodic inspections, beyond this program's one-time inspection scope. In these periodic inspections, a sample of 3 percent of the population or a maximum of 10 components per population are visually and mechanically (for buried fire protection gray cast iron and ductile iron components) inspected during each 10 year period.~~

~~The acceptance criteria will consist of no visible evidence of selective leaching. For copper based alloys the acceptance criteria will be no noticeable change in color from the normal yellow color to the reddish copper color or green-copper oxide. For gray cast iron and~~

~~ductile iron, the acceptance criteria is the presence of no more than a removable superficial layer of dealloying. The components must meet system design requirements such as minimum wall thickness, when extended to the end of the period of extended operation.~~

The Selective Leaching Program one-time visual inspections will be conducted within 5 years of, and no later than six months prior to, the period of extended operation. ~~The periodic inspections will recur on 10-year intervals thereafter.~~

Attachment 12

LRA Section: A.1.45

LRA Page Number(s): A-45

Reference: Applicant Initiated

Description of Change: The purpose of NUREG-1801, XI.M33 is to demonstrate the absence of selective leaching. The program for selective leaching of materials ensures the integrity of the components made of gray cast iron and copper alloys (except for inhibited brass) that contain greater than 15 percent zinc (> 15% Zn) or greater than 8 percent aluminum (>8% Al in the case of aluminum-bronze) exposed to a raw water, closed cooling water, treated water, or ground water environment that may lead to selective leaching of one of the metal components where there has not been previous experience of selective leaching. Program scope states "For materials and environments where selective leaching is currently occurring…, a plant-specific program is required." Plant-specific OE CR-2024-02317 identifies instances of selective leaching occurring at PNPP.

A new section A.1.45 is added to the LRA to accommodate the new plant specific program.

PNPP LRA Section A.1.45, Page A-45 is revised as follows:

A.1.45 PLANT-SPECIFIC PERIODIC INSPECTIONS FOR SELECTIVE LEACHING PROGRAM

The Plant-Specific Periodic Inspections for Selective Leaching Program is a new plant-specific program that will monitor for and manage the effects of selective leaching for component material/environment populations that have incurred selective leaching at PNPP. The component material/environment populations included in this program are limited to:

- gray cast iron/raw water,
- gray cast iron/soil,
- gray cast iron (ductile iron)/soil

The scope of this program does not include the component material/environment populations that are included in the scope of the XI.M33, *Selective Leaching* program.

The Plant-Specific Periodic Inspections for Selective Leaching Program includes periodic and opportunistic inspections using visual examinations coupled with mechanical examination techniques, and destructive examinations. These techniques can determine whether loss of materials due to selective leaching is occurring and whether selective leaching will affect the ability of the components to perform their intended function for the period of extended operation.

The Plant-Specific Periodic Inspections for Selective Leaching Program is a new program, and the initial inspections will commence at least 6 months prior to the period of extended operation, with all required inspections completed within the first 10-year period of the period of extended operation, and a second inspection interval will occur in the second 10-year period of the period of extended operation.

Attachment 13

LRA Section: Table A.3

LRA Page Number(s): A-83

Reference: Applicant Initiated

Description of Change: The new Plant-Specific Selective Leaching Program monitors for and manages the effects of selective leaching for the following material/environment populations:

- gray cast iron/raw water,
- gray cast iron/soil,
- gray cast iron (ductile iron)/soil

The LRA commitment table of Appendix A (Table A.3) is modified to incorporate the new plant specific program. Also a minor typographical error is corrected for Commitment No. 43.

PNPP LRA Table A.3, Page A-83 (as previously modified under L-24-108 Supplement 3 Attachment 30), is revised as follows:

NOTE: Only those table rows with revised text are included in the following table. Table rows unaffected by these changes are omitted from this attachment.

Table A.3
License Renewal
Commitments

Item No.	AMP	Commitment	Implementation Schedule	Related LRA Sections
43 (Cont.)	XI.S6	30. Acceptance criteria for indication of leaching of calcium hydroxide will be as follows: Groundwater parameters are no longer ~~be~~ considered non-aggressive if they exceed: pH < 5.5, chlorides > 500 ppm sulfates >1500 ppm		
44	XI.M2	Continue the existing Water Chemistry Program	Ongoing	A.1.44 B.2.44
45	N/A	Continue the existing operating experience program to evaluate age-related degradation or aging management impacts to structures and components to manage aging management program effectiveness and determine the need for new programs consistent with LR-ISG-2011-05.	Ongoing	A.1 B.1.4
46	PS-SL	Implement the new Plant-Specific Periodic Inspections for Selective Leaching Program	May 8, 2026	A.1.45 B.2.45

Attachment 14

LRA Section: Table B.1-1

LRA Page Number(s): B-10

Reference: Applicant Initiated

Description of Change: The new Plant-Specific Periodic Inspections for Selective Leaching Program monitors for and manages the effects of selective leaching for the following material/environment populations:

- gray cast iron/raw water,
- gray cast iron/soil,
- gray cast iron (ductile iron)/soil

Appendix B for the LRA and Table B.1-1 is revised to accommodate the new plant specific program.

PNPP LRA Table B.1-1, Page B-10 is revised as follows:

NOTE: Only those table rows with the revised text are included in the following table. Table rows unaffected by these changes are omitted from this attachment.

Table B.1-1
Correlation of NUREG-1801 and PNPP Aging Management Programs

NUREG-1801 Number	NUREG-1801 Program	PNPP Program	LRA Sections
XI.S8	Protective Coating Monitoring and Maintenance Program	Protective Coating Monitoring and Maintenance Program	B.2.38
XI.E1	Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Non-EQ Insulated Cables and Connections Program	B.2.34

NUREG-1801 Number	NUREG-1801 Program	PNPP Program	LRA Sections
XI.E2	Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits	Non-EQ Instrumentation Circuits Program	B.2.33
XI.E3	Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Non-EQ Inaccessible Power Cables Program	B.2.32
XI.E4	Metal Enclosed Bus	Not applicable. There are no in-scope metal enclosed bus for PNPP	N/A
XI.E5	Fuse Holders	Fuse Holders	B.2.24
XI.E6	Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Non-EQ Electrical Cable Connections Program	B.2.31
N/A	N/A	Plant-Specific Periodic Inspections for Selective Leaching Program	B.2.45

Attachment 15

LRA Section: Table B.1-2

LRA Page Number(s): B-14

Reference: Applicant Initiated

Description of Change: The new Plant-Specific Selective Leaching Program monitors for and manages the effects of selective leaching for the following material/environment populations:

- gray cast iron/raw water,
- gray cast iron/soil,
- gray cast iron (ductile iron)/soil

Appendix B for the LRA and Table B.1-2 is revised to accommodate the new plant specific program.

PNPP LRA Table B.1-2, Page B-14 (as previously modified under L-24-110 Annual Update Attachment 8) is revised as follows:

NOTE: Only those table rows with revised text are included in the following table. Table rows unaffected by these changes are omitted from this attachment.

Table B.1-2
Consistency of PNPP Aging Management Programs with NUREG-1801

Program Name	New/ Existing	Consistent With NUREG-1801	Consistent With NUREG-1801 With Exceptions	Plant Specific	Enhancement Required
Selective Leaching Program	New	Yes	Yes	~~Yes (*)~~ --	--
Structures Monitoring Program	Existing	Yes	--	--	Yes
Water Chemistry Program	Existing	Yes	Yes	--	--

Program Name	New/ Existing	Consistent With NUREG-1801	Consistent With NUREG-1801 With Exceptions	Plant Specific	Enhancement Required
Plant-Specific Periodic Inspections for Selective Leaching Program	New	--	--	Yes	--

~~* Addresses one material/environment combination that experienced selective leaching. The remaining program scope is consistence with NUREG-1801.~~

Attachment 16

LRA Section: B.2.24

LRA Page Number(s): B-79

References: Applicant Initiated

Description of Change: LRA Section B.2.24, Fuse Holders Program is supplemented to correct the text in the conclusion by deleting the text that states there are program enhancements.

PNPP LRA Section B.2.24, Page B-79, (as previously modified under L-24-109 and L-24-189 Supplement 1 Attachment 4) is revised as follows:

B.2.24 FUSE HOLDERS PROGRAM

Program Description

The Fuse Holders Program is a new Condition Monitoring Program. The program provides reasonable assurance that the intended functions of the metallic clamps of fuse holders located outside of active devices are maintained consistent with the current licensing basis through the period of extended operation. Fuse holders located inside an active device are not within the scope of this program. Fuse holders subject to increased resistance of connection due to chemical contamination, corrosion, and oxidation or fatigue caused by ohmic heating, thermal cycling or electrical transients will be tested, by thermography, contact resistance testing, or other appropriate test methods, at least once every 10 years to provide an indication of the condition of the metallic clamps of the fuse holders.

The first tests for license renewal will be completed no later than six months prior to the period of extended operation.

NUREG-1801 Consistency

The Fuse Holders Program is a new PNPP program that is consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.E5, Fuse Holders.

Exceptions to NUREG-1801:

None.

Enhancements:

None.

Operating Experience

Industry operating experience and guidance as documented in NUREG-1760, IEEE Std. 1205-2000, and NRC Information Notices 86-87, 87-42 and 91-78 has shown that loosening of fuse holders and corrosion offuse clips are aging mechanisms that could lead to a loss of electricalcontinuity if left unmanaged.

A review of plant-specific operating experience has found no evidence of thermal anomalies in annual tests of fuse holders outside active devices from 2003 to 2023.

Conclusion

The implementation of the Fuse Holders program~~, with enhancement,~~ provides reasonable assurance that the aging effects will be managed such that components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Attachment 17

LRA Section: B.2.42

LRA Page Number(s): B-117, B-118, and B-119

References: Applicant Initiated

Description of Change: The purpose of NUREG-1801, XI.M33 is to demonstrate the absence of selective leaching. The program for selective leaching of materials ensures the integrity of the components made of gray cast iron and copper alloys (except for inhibited brass) that contain greater than 15 percent zinc (> 15% Zn) or greater than 8 percent aluminum (>8% Al in the case of aluminum-bronze) exposed to a raw water, closed cooling water, treated water, or ground water environment that may lead to selective leaching of one of the metal components where there has not been previous experience of selective leaching. Program scope states "For materials and environments where selective leaching is currently occurring…, a plant-specific program is required." Plant-specific OE CR-2024-02317 identifies instances of selective leaching occurring at PNPP. As such, LRA Section B.2.42 is revised to reflect use of a new, plant-specific, on-going aging management program for the material/environment combinations where selective leaching has been identified in the new LRA Section B.2.45 as incorporated in Attachment 18 of this supplement.

PNPP LRA Section B.2.42, Pages B-117 through B-119 (as previously modified under L-24-110 Annual Update Attachment 8) is revised as follows:

B.2.42 SELECTIVE LEACHING PROGRAM

Program Description

The Selective Leaching Program is a new ~~plant-specific~~**condition monitoring aging management** program that will ~~monitor for and manage the effects of~~**ensure the integrity of components within the scope of license renewal that are susceptible to loss of material due to** selective leaching **by demonstrating the absence of such leaching**. The **Selective Leaching P**~~p~~rogram ~~for selective leaching of materials~~ will ~~ensure the integrity of the components made of ductile iron, gray cast iron and copper alloys (except for inhibited brass) that contain greater than 15 percent zinc (> 15% Zn) exposed to~~**identify the aging effects of loss of material due to selective leaching for components subject to an environment of** raw water, closed cycle cooling water (CCCW), treated water, waste water ~~or~~ soil ~~that may lead to selective leaching of one of the metal components~~**or condensation**.

Components include piping, heat exchangers, pump casings, sight glass (body), valve bodies and strainer bodies. The materials of construction for these components that are susceptible to selective leaching are ductile iron, gray cast iron and copper alloys (except for inhibited brass) that contain greater than 15 percent zinc (> 15% Zn). There are no aluminum bronze in-scope components with greater than eight percent aluminum.

The program ~~will include~~is a one-time visual inspection ~~coupled with either~~supplemented by hardness measurement or other mechanical examination techniques such as destructive testing ~~(when the opportunity arises)~~, scraping, or chipping (where practicable based on component form and configuration) of a representative sample of selected components that may be susceptible to selective leaching~~. Periodic selective leaching inspections are conducted on component populations with materials and environments that have exhibited selective leaching at PNPP. Follow-up of unacceptable inspection findings will include an evaluation using the corrective action program and a possible expansion of the inspection sample size and location. Destructive examinations of components to determine the presence and depth of dealloying through-wall thickness are conducted.~~

Each group of components with the same material/environment combination is considered a separate population. Twenty percent of a susceptible component population~~One-time inspections are conducted on a representative sample of the component population and will focus on the bounding or lead components most susceptible to aging due to time in service, severity of operating conditions, and lowest design margin for each population. A representative sample size will be 20% of the population (defined as components having the same material and environment combination)~~ with a maximum of 25 constitutes a representative sample size~~components~~. Where practical, the representative sample of each of those populations will focus on the bounding or lead components most susceptible to aging due to time in service, severity of operating conditions, and lowest design margin. Otherwise, a technical justification of the methodology and sample size used for selecting components for ~~the~~one-time inspections will be included as part of the program's documentation.

The scope of this program does not include material and environment combinations where selective leaching has occurred and either (1) the component was replaced with the same material or (2) selective leaching is actively occurring. For those material/environment combination populations, a plant specific program will be used as discussed in the OE section below.

Follow-up of unacceptable inspection findings will include an evaluation using the corrective action program to determine acceptability of the affected components for further service, and a possible expansion of the inspection sample size and location.

~~According to the GALL Section XI.M33, for materials and environments where selective leaching is currently occurring, a plant specific program is required. PNPP has recently observed selective leaching in valve bodies (hydrants) that are buried (soil external environment), gray cast iron, fire protection components (raw water internal environment). A review of aging management data confirms that material and environment combination is limited to the fire protection system. Thus, the population of buried, gray cast iron and ductile iron, fire protection components are subject to periodic inspections, beyond this program's one-time inspection scope. In these periodic inspections, a sample of 3 percent of the population or a maximum of 10 components per population are visually and mechanically (for buried fire protection gray cast iron and ductile iron components) inspected during each 10 year period.~~

~~The acceptance criteria will consist of no visible evidence of selective leaching. For copper based alloys the acceptance criteria will be no noticeable change in color from the normal yellow color to the reddish copper color or green-copper oxide. For gray cast iron and ductile iron, the acceptance criteria is the presence of no more than a removable superficial layer of dealloying. The components must meet system design requirements such as minimum wall thickness, when extended to the end of the period of extended operation.~~

~~**extended operation**~~

The Selective Leaching Program one-time visual inspections will be conducted within 5 years of, and no later than ~~six~~**6** months prior to, the period of extended operation. ~~The periodic inspections will recur on 10-year intervals thereafter.~~

NUREG-1801 Consistency

The Selective Leaching Program is ~~a new plant-specific program for PNPP that will be~~ consistent with the 10 elements of an effective aging management program guidance as described in NUREG-1801, Section XI.M33 *Selective Leaching* ~~and~~**as** revised by LR-ISG-2011-03 and LR-ISG-2015-01, with ~~two~~**one** exception~~s~~.

Exceptions to NUREG-1801

~~1.~~ Materials exposed to contaminated fuel oil and water-contaminated lube oil are managed under the XI.M39, *Lubricating Oil Analysis*, and XI.M30, *Fuel Oil Chemistry*, programs. **Program Element Affected: Scope (Element 1)**

Justification for Exception

The XI.M39, *Lubricating Oil Analysis* and XI.M30, *Fuel Oil Chemistry* programs assure the exclusion of water such that materials susceptible to selective leaching are not exposed to water contamination consistent with NUREG 2191 Section XI.M33.

~~2. The periodic selective leaching program is developed using guidance from NUREG-2191. Program Elements Affected: Scope (Element 1), Preventive Actions (Element 2), Parameters Monitored/Inspected (Element 3), Detection of Aging Effects (Element 4), Monitoring and Trending (Element 5), Acceptance Criteria (Element 6), Operating Experience (Element 10).~~

~~ence (Element 10),~~

~~Justification for exception~~

~~NUREG-1801 XI-M33, *Selective Leaching*, provides guidance for a one-time inspection program provided no plant-specific operating experience identifies multiple occurrences of selective leaching. However, PNPP has observed selective leaching in buried, gray cast iron, fire water system components. NUREG-2191 XI.M33, *Selective Leaching*, provides recommendations for an acceptable periodic selective leaching aging management program.~~

Enhancements

None

Operating Experience

The ~~following~~ operating experience review provides objective evidence that the Selective Leaching Program will be effective in ensuring that component intended functions are maintained consistent with the current licensing basis during the period of extended operation.

An extensive review of Operating Experience since 2013 is documented**, the following findings were identified in the PNPP corrective action program for selective leaching**.

~~Recent evidence of selective leaching in two gray cast iron fire hydrants was identified as part of one-time inspections at PNPP.~~**PNPP evaluates industry OE items for applicability per the OE Program and takes appropriate corrective actions.**

IN 94-59

NRC IN 94-59, "Accelerated de-alloying of cast aluminum bronze valves caused by microbiologically induced corrosion," noted that a number of service water Jamesbury cast aluminum bronze ball valves (1.5 to 2 inch) were seeping water through the valve body at the Surrey Power Station. The cause was determined to be accelerated de-alloying of cast aluminum bronze valves (i.e., selective leaching) initiated by MIC caused by a number or factors.

At PNPP there are no aluminum-bronze in-scope components with greater than eight percent aluminum.

~~ter than eight percent aluminum.~~

IN 2020-04

The NRC issued IN 2020-04 "Operating Experience Related to Failure of Buried Fire Protection Main Yard Piping" dated December 17, 2020. The IN was issued to inform the addressees of OE involving the loss of function of buried cast iron fire water main yard piping due to multiple factors, including graphitic corrosion (i.e., selective leaching), corrosion buildup, low-cyclic fatigue, and general wall thinning or localized loss of material.

PNPP evaluated this IN for applicability and determined the site uses the more reliable cement-lined ductile iron. Opportunistic inspections throughout the fleet have found the cement lining and internal piping in good condition. No further actions were required (see plant-specific OE).

~~the more reliable cement-lined ductile iron. Opportunistic inspections throughout the fleet have found the cement lining and internal piping in good condition. No further actions were required (see plant-specific OE).~~

Plant-Specific Operating Experience

In 2014 PNPP experienced an unplanned fire impairment due to a leak in underground piping. The leak was found ~~be~~ between two 45˚ elbows on a 10" ductile iron drain pipe (with concrete lining) between one catch basin and another. The section of pipe was replaced. The failure analysis concluded that the analyzed pipe section suffered OD corrosion around most of the circumference. The "bottom" surface, with respect to in service orientation, was severely attacked in comparison to the other surfaces. The corrosion type was classified as "dealloying." (Component population; Ductile iron material in a soil environment.)

In 2024 a visual inspection found evidence of selective leaching on two fire protection hydrant bowls, the hydrant bowls were replaced. Destructive testing was performed on both hydrant bowls. One hydrant bowl had exterior graphitic corrosion. The other had graphitic corrosion on both the interior and exterior surfaces. Hardness measurements were not taken. Both fire hydrants were made of gray cast iron (Component populations: Gray cast iron in a soil environment, and gray cast iron in a raw water environment).

~~nt).~~

~~The NUREG-2191 XI.M33, Selective Leaching program for periodic and one-time inspections provides guidance for developing this plant-specific program. The program is informed and enhanced when necessary through the systematic and ongoing review of both plant-specific and industry OE including research and development such that the effectiveness of the AMP is assured.~~

The program is informed and enhanced when necessary through the systematic and ongoing review of both plant-specific and industry OE research and research and development such that the effectiveness of the AMP is assured.

Based on the above plant-specific operating experience, a plant-specific leaching program shall be implemented at least 6 months prior to entry into the period of extended operation for the following component material/environment populations.

- **Gray cast iron/raw water**
- **Gray cast iron/soil**
- **Gray cast iron (ductile iron)/soil**

Conclusion

The ~~Selective Leaching P~~**p**rogram will provide reasonable assurance that aging effects will be managed such that the applicable components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

Attachment 18

LRA Section: B.2.45

LRA Page Number(s): B-130

References: Applicant Initiated

Description of Change: The purpose of NUREG-1801, XI.M33 is to demonstrate the absence of selective leaching. The program for selective leaching of materials ensures the integrity of the components made of gray cast iron and copper alloys (except for inhibited brass) that contain greater than 15 percent zinc (> 15% Zn) or greater than 8 percent aluminum (>8% Al in the case of aluminum-bronze) exposed to a raw water, closed cooling water, treated water, or ground water environment that may lead to selective leaching of one of the metal components where there has not been previous experience of selective leaching. Program scope states "For materials and environments where selective leaching is currently occurring…, a plant-specific program is required." Plant-specific OE CR-2024-02317 identifies instances of selective leaching occurring at PNPP. Consistent with Attachment 12 of this supplement, a new LRA Section B.2.45 is incorporated for the new plant specific selective leaching monitoring program.

PNPP LRA Section B.2.45, Page B-130 is revised as follows:

B.2.45 PLANT-SPECIFIC PERIODIC INSPECTIONS FOR SELECTIVE LEACHING PROGRAM

Program Description

The Plant-Specific Periodic Inspections for Selective Leaching Program is a new plant-specific program that will monitor for and manage the effects of selective leaching for component material/environment populations that have incurred selective leaching at PNPP. This is a plant-specific AMP with the following ten elements defined specifically for PNPP.

Element 1 – Scope of Program: The Plant-Specific Periodic Inspections for Selective Leaching Program will manage loss of material due to selective leaching for component material/environment populations that have incurred selective leaching effects at PNPP. This program will determine whether selective leaching will affect the ability of the components to perform their intended function for the period of extended operation. The component material/environment populations included in this program are limited to:

- gray cast iron/raw water,
- gray cast iron/soil,
- gray cast iron (ductile iron)/soil

The scope of this program does not include the component material/environment populations that are included in the scope of the Selective Leaching Program (B.2.42).

Element 2 – Preventive Actions: Although the Plant-Specific Periodic Inspections for Selective Leaching Program will not provide guidance on preventive actions, water chemistry control of certain parameters (e.g., pH, concentration of corrosive contaminants, dissolved oxygen), cathodic protection, or coatings can be effective in minimizing selective leaching.

Element 3 – Parameters Monitored or Inspected: The Plant-Specific Periodic Inspections for Selective Leaching Program will monitor visual appearance (differences in color, porosity, general abnormal surface conditions of materials), surface conditions through mechanical examination techniques (e.g., chipping, scraping), and the presence and depth of dealloying through-wall thickness and surface hardness through destructive examinations. This monitoring will be performed where feasible based on form and configuration.

Element 4 – Detection of Aging Effects: Selective leaching inspections are conducted on a representative sample of each population. A population is defined as the same material and environment combination. Inspections and examinations will consist of the following:

- Visual inspections of all accessible surfaces for the component material/environment populations in the scope of this program. Graphitized cast iron cannot be reliably identified through visual examination, as the appearance of the graphite surface layer created by selective leaching does not always differ appreciably from the typical cast iron surface.

- Mechanical examination techniques, such as chipping and scraping, augmented visual inspections for gray cast iron components.

- Destructive examinations are used to determine the presence of and depth of dealloying through-wall thickness of components.

Opportunistic and periodic inspections will be conducted for the component material/environment populations in the scope of this program. Opportunistic inspections will be conducted whenever components are opened, or buried or submerged surfaces are exposed.

These inspections will commence at least 6 months prior to the period of extended operation, with all required inspections completed within the first 10 year period of the period of extended operation, and a second inspection interval will occur in the second 10 year period of the period of extended operation.

The plant-specific periodic inspections in each inspection period consist of two facets: (1) visual/mechanical, and (2) destructive.

- The visual/mechanical periodic inspections will consist of a sample of 3 percent of the population or a maximum of 10 components per population. The populations will be visually inspected and mechanically inspected. When inspections are conducted on piping, a 1-foot axial length section is considered as one inspection.

- The destructive examinations are dependent on population size and established as follows:

  - There are more than 35 gray cast iron valves and other components in a raw water environment (applies to the P49 ESW Screenwash System, P54 Fire Protection System, and P71 Potable Water Systems). For sample populations with greater than 35 components, PNPP will perform two destructive examinations for this population during each inspection period; otherwise, a technical justification of the methodology and sample size used for selecting components for inspection will be included as part of the program's documentation.

  - ~~umentation~~

  - There are more than 35 gray cast iron valves in a soil environment (applies to the P54 Fire Protection System). For sample populations with greater than 35 components, PNPP will perform two destructive examinations for this population during each inspection period; otherwise, a technical justification of the methodology and sample size used for selecting components for inspection will be included as part of the program's documentation.

  - The Fire Protection System contains one gray cast iron (ductile iron) piping component with a soil environment. For populations with less than 35 components, PNPP will perform one destructive examination for this population during each inspection period; otherwise, a technical justification of the methodology and sample size used for selecting components for inspection will be included as part of the program's documentation.

  - ~~ping component with a soil environment. For populations with less than 35 components, PNPP will perform one destructive examination for this population during each inspection period; otherwise, a technical justification of the methodology and sample size used for selecting components for inspection will be included as part of the program's documentation.~~

- The number of visual and mechanical inspections may be reduced by two for each component that is destructively examined beyond the minimum number of destructive examinations recommended in each inspection interval. Inspections, where possible, focus on the bounding or lead components most susceptible to aging based on time-in-service and severity of operating conditions for each population. Opportunistic inspections may be credited as periodic inspections as long as the inspection locations selection criteria are met.

- ~~ia are met.~~

The inspections will follow site procedures that include inspection parameters such as lighting, distance, offset, surface coverage, presence of protective coatings, and cleaning processes.

Element 5 – Monitoring and Trending: Where practical, identified degradation will be evaluated and subsequent rates of degradation will be projected until the next scheduled inspection. Results will be evaluated against acceptance criteria to confirm that the sampling bases (e.g., selection, size, frequency) will maintain the components' intended functions throughout the period of extended operation based on the projected rate and extent of degradation.

Program effectiveness will be assessed every five years per NEI 14-12.

Element 6 – Acceptance Criteria: The acceptance criteria for gray cast iron and ductile iron will include:

a) for gray cast iron and ductile iron, the absence of a surface layer that can be easily removed by chipping or scraping or identified in the destructive examinations,

b) the presence of no more than a superficial layer of dealloying, as determined by removal of the dealloyed material by mechanical removal, and

c) the components meet system design requirements such as minimum wall thickness, when projected to the end of the period of extended operation. When evaluating a component in relation to criterion (b), no credit is taken for the material properties of the dealloyed portion of the component.

When the acceptance criteria are not met such that, it is determined that the affected component should be replaced prior to the end of the period of extended operation, additional inspections will be performed if the cause of the aging effect for each applicable material and environment is not corrected by repair or replacement for all components constructed of the same material

and exposed to the same environment. The number of additional inspections will be equal to the number of failed inspections for each population within the scope of this program with either of the following, whichever is less:

~~ach population within the scope of this program with either of the following, whichever is less:~~

- a minimum of five additional visual and mechanical inspections when visual and mechanical inspections did not meet acceptance criteria, or
- 20 percent of each applicable material and environment combination is inspected, and
- a minimum of one additional destructive examination when destruction examination(s) did not meet acceptance criteria.

If subsequent inspections do not meet acceptance criteria, an extent of condition and extent of cause analysis will be conducted to determine the further extent of inspections. The timing of the additional inspections will be based on the severity of the degradation identified and is commensurate with the potential for loss of intended function. However, in all cases, the additional inspections will be completed within the interval in which the original inspection was conducted or, if identified in the latter half of the current inspection interval, within the next refueling outage interval. These additional inspections conducted in the next inspection interval cannot also be credited towards the number of inspections in the latter interval. Additional samples will be inspected for any recurring degradation to ensure corrective actions appropriately address the associated causes. The additional inspections include inspections at each unit with the same material, environment, and aging effect combination within the scope of this program.

~~n the scope of this program.~~

The program will include a process to evaluate difficult-to-access surfaces if there are unacceptable inspection findings within the same material and environment population.

Element 7 – Corrective Actions: This element is common to Perry programs and activities that are credited with aging management during the period of extended operation and is discussed in LRA Section B.1.3, *Quality Assurance Program and Administrative Controls.*

Element 8 – Confirmation Process: This element is common to Perry programs and activities that are credited with aging management during the period of extended operation and is discussed in LRA Section B.1.3, *Quality Assurance Program and Administrative Controls.*

Element 9 – Administrative Controls: This element is common to Perry programs and activities that are credited with aging management during the period of extended operation and is discussed in LRA Section B.1.3, *Quality Assurance Program and Administrative Controls.*

Element 10 – Operating Experience: The operating experience review provides objective evidence that the Plant-Specific Periodic Inspections for Selective Leaching Program will be effective in ensuring that component intended functions are maintained consistent with the current licensing basis during the period of extended operation. An extensive review of Operating Experience since 2013 is documented.

Industry OE

Industry OE items are evaluated for applicability in accordance with the PNPP OE Program and takes appropriate corrective actions.

Plant-Specific OE

- In 2014 PNPP experienced an unplanned fire impairment due to a leak in underground piping. The leak was found to be between two 45˚ elbows on a 10" ductile iron drain pipe (with concrete lining) between one catch basin and another. The section of pipe was replaced. The failure analysis report concluded that the analyzed pipe section suffered OD corrosion around most of the circumference. The "bottom" surface, with respect to in-service orientation, was severely attacked in comparison to the other surfaces. The corrosion type was classified as "dealloying." The affected piping material was ductile iron.

- ~~corrosion type was classified as "dealloying." The affected piping material was ductile iron.~~

- In 2024 a visual inspection found evidence of selective leaching on two fire protection hydrant bowls, the hydrant bowls were replaced. Destructive testing was performed on both hydrant bowls. One hydrant bowl had exterior graphitic corrosion. The other had graphitic corrosion on both the interior and exterior surfaces. Hardness measurements were not taken. Both fire hydrants were made of gray cast iron.

The program is informed and enhanced when necessary through the systematic and ongoing review of both plant-specific and industry OE including research and development such that the effectiveness of the program is periodically evaluated.