LimerickNPEm Resource

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To: Kuntz, Robert
Subject: FW: 3.20.12 - LIM - Response to RAI dated 2.23.12 & 3.9.12 re. LGS LRA.pdf - Adobe Acrobat Professional
Attachments: 3.20.12 - LIM - Response to RAI dated 2.23.12 & 3.9.12 re. LGS LRA.pdf

Rob

FYI Letter just sent to DCC

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10 CFR 50
10 CFR 51
10 CFR 54

March 20, 2012

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

Limerick Generating Station, Units 1 and 2
Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353

Subject: Response to NRC Requests for Additional Information, dated February 23 and March 9, 2012, related to the Limerick Generating Station License Renewal Application

Reference:
1. Exelon Generation Company, LLC letter from Michael P. Gallagher to NRC Document Control Desk, "Application for Renewed Operating Licenses", dated June 22, 2011
2. Letter from Robert F. Kuntz (NRC) to Michael P. Gallagher (Exelon), "Requests for Additional Information for the review of the Limerick Generating Station, Units 1 and 2, License Renewal Application (TAC Nos. ME6555, ME6556)", dated February 23, 2012
3. Letter from Robert F. Kuntz (NRC) to Michael P. Gallagher (Exelon), "Requests for Additional Information for the review of the Limerick Generating Station, Units 1 and 2, License Renewal Application (TAC Nos. ME6555, ME6556)", dated March 9, 2012

In the Reference 1 letter, Exelon Generation Company, LLC (Exelon) submitted the License Renewal Application (LRA) for the Limerick Generating Station, Units 1 and 2 (LGS). In the Reference 2 and Reference 3 letters, the NRC requested additional information to support the staffs' review of the LRA.

Enclosed are the responses to these requests for additional information.

This letter and its enclosures contain no regulatory commitments.

If you have any questions, please contact Mr. Al Fulvio, Manager, Exelon License Renewal, at 610-765-5936.

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

Executed on 3-20-2012

Respectfully,

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

Enclosures: A: Responses to Requests for Additional Information
B: Updates to affected LGS LRA sections

cc: Regional Administrator – NRC Region I
NRC Project Manager (Safety Review), NRR-DLR
NRC Project Manager (Environmental Review), NRR-DLR
NRC Project Manager, NRR-Limerick Generating Station
NRC Senior Resident Inspector, Limerick Generating Station
R. R. Janati, Commonwealth of Pennsylvania

Enclosure A

Responses to Requests for Additional Information related to various sections of the LGS License Renewal Application (LRA)

RAI 2.2-1
RAI 2.3.3-1
RAI 2.3.3.8-1
RAI 2.3.3.8-2
RAI 2.3.3.8-3
RAI 2.3.3.8-4
RAI 2.3.3.8-5
RAI 2.3.3.12-1
RAI 2.3.3.13-1
RAI 2.3.3.14-1
RAI 2.3.3.14-2
RAI 2.3.3.17-1
RAI 2.3.3.17-2
RAI 2.3.3.18-1
RAI 2.3.3.22-1
RAI 2.3.3.22-2
RAI 2.3.4-1
RAI 2.3.4.3-1
RAI 2.3.4.6-1
RAI 2.3.4.7-1
RAI 2.3.4.7-2
RAI B.2.1.33-2
RAI B.2.1.33-3
RAI 4.1-2

RAI 2.2-1

The scoping criteria are described in Section 2.1 of license renewal application (LRA). LRA Section 2.2, Table 2.2-1, "Scoping Results," provides the results of applying the license renewal scoping criteria to systems, structures, and components (SSCs). The following systems, as described in the Updated Final Safety Analysis Report (UFSAR), could not be located in LRA Table 2.2-1.

UFSAR Section	System
1.2.4.3.1.7 Plant Monitoring System (PMS)	Plant Monitoring System
7.1.2.1.12 Area Radiation Monitoring System	Area Radiation Monitoring System
7.1.2.1.46 Emergency Response Facility Data System	Emergency Response Facility Data System
9.4.3.2.4 Chemistry Laboratory Expansion	Chemistry Laboratory Air Supply and Exhaust Systems

Justify the exclusion of the above systems from Table 2.2-1.

Exelon Response

The Plant Monitoring System described in UFSAR Section 1.2.4.3.1.7 is part of the Miscellaneous I&C System. As indicated on LRA Table 2.2-1, the Miscellaneous I&C System is not in scope for license renewal.

The Area Radiation Monitoring System described in UFSAR Section 7.1.2.1.12 is part of the Plant Leak Detection and Radiation Monitoring System, which is included on LRA Table 2.2-1.

The Emergency Response Facility Data System described in UFSAR Section 7.1.2.1.46 is part of the Miscellaneous I&C System. As indicated on LRA Table 2.2-1, the Miscellaneous I&C System is not in scope for license renewal.

The ventilation system for the Chemistry Laboratory Expansion described in UFSAR Section 9.4.3.2.4 is part of the Miscellaneous Ventilation System. As indicated on LRA Table 2.2-1, the Miscellaneous Ventilation System is not in scope for license renewal.

RAI 2.3.3-1

For the license renewal boundary drawing locations identified in the table below, the staff could not determine the basis for the change in scoping criteria from 10 CFR 54.4 (a)(1) to 10 CFR 54.4 (a)(2).

Nonsafety-related/Safety-Related Interface Item	License Renewal Boundary Drawing Number & Location	Explanation of Issue
2.3.3.17 Process Radiation Monitoring System		
a	LR-M-26 Sheet 4, location H-6	½" SST line connected to "Sample B" line.

2.3.3.4 Containment Enclosure Ventilation System		
a	LR-M-78 Sheet 1, locations D-5 thru D-7 and F-5 thru F-7	At valves 0001A, 0002A, 0003A, 0005A and 0001B, 0002B, 0003B, 0005B.
b	LR-M-90 Sheet 1, locations D-2, D-4, D-7, E-3, G-4,	Several ¾" lines to vent and 1" drain lines.
c	LR-M-90 Sheet 2, Multiple locations	All capped ¾" vent and drain lines.
2.3.3.8 Emergency Diesel Generator System		
a	LR-M-20 Sheets 7 and 13, locations C-3, E-3, E-5, D-5 and E-8	At valves 1430A, 1406A, 1415A, 1437A, 1413A 1154A, 2430A, 2406A, 2415A, 2437A, 2413A and 2154A.
b	LR-M-20 Sheets 4 and 10, locations C-3 and C-4	At valves 1511A, 1510A, 1509A, 2511A, 2510A and 2509A.
c	LR-M-20 Sheets 5 and 11, locations F-3 and E-5	At valves 1608A, 1604A, 2608A, and 2604A.
2.3.3.19 Radwaste System		
a	LR-M-61 Sheet 1, locations G-5 and C-5	At valves 1081 and 1082.
2.3.3.21 Reactor Water Cleanup System		
a	LR-M-44 Sheet 1, Multiple locations	Several (12 locations) 1" capped lines.
2.3.3.22 Safety Related Service Water System		
a	LR-M-51 Sheet 8, location D-5	At valve 214B.
b	LR-M-51 Sheet 4, locations D-4 & D-5	At valve 1141B and ¾" GBB-123 line at valve HV-C 1F103B.
c	LR-M-13 Sheet 2, location G-5	At valve 2066A.
d	LR-M-12 Sheet 1, Multiple locations (35 locations)	Multiple 1" flush, drain and capped lines.
e	LR-M-11 Sheet 2, Multiple locations (16 locations)	Multiple ¾" flush, drain and capped lines.
f	LR-M-11 Sheet 3, Multiple locations (17 locations)	Multiple ¾" flush, drain and capped lines.
g	LR-M-11 Sheet 4, Multiple locations (32 locations)	Multiple ¾" and 1" flush, drain and capped lines.
h	LR-M-11 Sheet 5, Multiple locations (34 locations)	Multiple ¾" and 1" flush, drain and capped lines.
2.3.3.26 Water Treatment and Distribution (WTD) System		
a	LR-M-78 Sheet 1, locations D-5 thru D-7 and F-5 thru F-7	At valves 0001A, 0002A, 0003A, 0005A and 0001B, 0002B, 0003B, 0005B without classification break at SR-NSR interface.

b	LR-M-90 Sheet 1, Locations D-2, D-4, D-7, E-3, F-4, G-4	Several ¾" lines to vent and 1" lines to Drain without classification break at the valves where there is a SR-NSR interface.
c	LR-M-90 Sheet 2, Several locations	All capped ¾" lines to vent and 1" lines to Drain without classification break at the valves where there is a SR-NSR interface.

Clarify the scoping classification of the pipe lines identified in the above table as within the scope of license renewal based on the criteria in 10 CFR 54.4(a)(2).

Exelon Response

Quality Assurance Diagrams (QADs) are the source documents that define the safety classification for sections of piping downstream of vent, drain test and flush valves to caps that are the subject of this request. The QADs show the transition from safety-related to nonsafety-related piping with the safety-related piping shown as bolded. A Piping and Instrumentation Diagram (P&ID) provides the bases for each license renewal drawing, and a QAD exists for each P&ID that includes safety-related piping components. Piping and components that perform or support a safety-related function are in scope based on 10 CFR 54.4 (a)(1) criteria. Nonsafety-related piping components within the Control Enclosure, Reactor Enclosure, Diesel Generator Enclosure, and Primary Containment that contain fluid are included in scope for potential spatial interaction based on the criteria in 10 CFR 54.4(a)(2) as discussed in LRA Section 2.1. The scoping classification of the piping lines identified in the above table are clarified as within the scope of license renewal based on the criteria in 10 CFR 54.4 (a)(1) or 10 CFR 54.4(a)(2), using the QADs as the bases for the safety classification as described below.

2.3.3.17 Process Radiation Monitoring System

a. The ½" SST lines connected to “Sample B” line at location H-6 and "Sample A" line at location G-6, on LR-M-26 Sheet 4, continue to "Detail M," shown on LR-M-26 at location H-1. Detail M shows a loop seal drain that may contain moisture. These lines are nonsafety-related as indicated on the QAD for LR-M-26 Sheet 4. Since this tubing is within the Control Enclosure it is in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

2.3.3.4 Containment Enclosure Ventilation System

a. The capped lines at valves 0001A, 0002A, 0003A, 0005A, 0001B, 0002B, 0003B and 0005B shown on LR-M-78 Sheet 1 are safety-related as indicated on the QAD for LR-M-78 Sheet 1. Therefore, these lines are within the scope of license renewal based on the criteria in 10 CFR 54.4(a)(1) and should not have been colored red. License renewal boundary drawing LR-M-78 Sheet 1 will be revised to color the capped piping downstream of valves 0001A, 0002A, 0003A, 0005A, 0001B, 0002B, 0003B and 0005B green.

b. The capped lines at several ¾" and 1" vent and drain valves shown on LR-M-90 Sheet 1 at multiple locations are nonsafety-related as indicated on the QAD for LR-M-90 Sheet 1. Since these piping sections may contain moisture and are within the Control Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

c. The capped lines at several ¾" and 1" vent and drain valves shown on LR-M-90 Sheet 2 at multiple locations are nonsafety-related as indicated on the QAD for LR-M-90 Sheet 2. Since these piping sections may contain moisture and are within the Control Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

2.3.3.8 Emergency Diesel Generator System

a. The capped lines downstream of valves 1437A, 1154A, 2437A and 2154A shown on LR-M-20 Sheets 7 and 13 are nonsafety-related as indicated on the QADs for LR-M-20 Sheets 7 and 13. Since these piping sections may contain moisture and are within the Diesel Generator Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria. The capped lines downstream of valves 1430A, 1406A, 1415A, 1413A, 2430A, 2406A, 2415A and 2413A shown on LR-M-20 Sheets 7 and 13 are safety-related as indicated on the QADs for LR-M-20 Sheets 7 and 13. Therefore, they are within the scope of license renewal based on the criteria in 10 CFR 54.4(a)(1) and should not have been colored red. License renewal boundary drawings LR-M-20 Sheets 7 and 13 will be revised to color the capped piping downstream of valves 1430A, 1406A, 1415A, 1413A, 2430A, 2406A, 2415A and 2413A green.

b. Piping downstream of valves 1511A, 1510A, 1509A, 2511A, 2510A and 2509A shown on LR-M-20 Sheets 4 and 10 are safety-related as indicated on the QADs for LR-M-20 Sheets 4 and 10. Therefore, they are within the scope of license renewal based on the criteria in 10 CFR 54.4(a)(1) and should not have been colored red. License renewal boundary drawings LR-M-20 Sheets 4 and 10 will be revised to color the piping downstream of valves 1511A, 1510A, 1509A, 2511A, 2510A and 2509A green.

c. Piping downstream of valves 1608A, 1604A, 2608A, and 2604A shown on LR-M-20 Sheets 5 and 11 are safety-related as indicated on the QADs for LR-M-20 Sheets 5 and 11. Therefore, they are within the scope of license renewal based on the criteria in 10 CFR 54.4(a)(1) and should not have been colored red. License renewal boundary drawings LR-M-20 Sheets 5 and 11 will be revised to color the piping downstream of valves 1608A, 1604A, 2608A and 2604A green.

2.3.3.19 Radwaste System

a. The capped lines at valves 1081 and 1082 shown on LR-M-61 Sheet 1 are nonsafety-related as indicated on the QAD for LR-M-61 Sheet 1. Since these piping sections may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

2.3.3.21 Reactor Water Cleanup System

a. The 1" capped lines at valves 1077A-D and 1078A-D shown on LR-M-044 Sheet 1 are nonsafety-related as indicated on the QAD for LR-M-44 Sheet 1. Since these piping sections may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria. The 1" capped lines at valves 1079, 1080, 1081 and 1082 shown on LR-M-044 Sheet 1 are safety-related as indicated on the QAD for LR-M-44 Sheet 1. Therefore, they are within the scope of license renewal based on the criteria in 10 CFR 54.4(a)(1) and should not have been colored red. License renewal boundary drawing LR-M-44 Sheet 1 will be revised to color the capped piping downstream of valves 1079, 1080, 1081 and 1082 green.

2.3.3.22 Safety Related Service Water System

a. The capped line at valve 214B shown on LR-M-51 Sheet 8 is nonsafety-related as indicated on the QAD for LR-M-51 Sheet 8. Since this piping section may contain moisture and is within the Reactor Enclosure it is in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

b. The capped line at valve 114B shown on LR-M-51 Sheet 4 is nonsafety-related as indicated on the QAD for LR-M-51 Sheet 4. Since this piping section may contain moisture and is within the Reactor Enclosure it is in scope for 10 CFR 54.4(a)(2) spatial interaction criteria. The capped ¾" GBB-123 line at valve HV-C-1F103B shown on LR-M-51 Sheet 4 is safety-related as indicated on the QAD for LR-M-51 Sheet 4. Therefore, this line is within the scope of license renewal based on the criteria in 10 CFR 54.4(a)(1) and should not have been colored red. License renewal boundary drawing LR-M-51 Sheet 4 will be revised to color the capped ¾" GBB-123 line at valve HV-C-1F103B green.

c. The capped line at valve 2066A shown on LR-M-13 Sheet 2 is nonsafety-related as indicated on the QAD for LR-M-13 Sheet 2. Since this piping section may contain moisture and is within the Reactor Enclosure it is in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

d. The capped lines at multiple (35 locations) flush, drain and vent connections shown on LR-M-12 Sheet 1 are nonsafety-related as indicated on the QAD for LR-M-12 Sheet 1. Since these piping sections may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

e. The capped lines at multiple (16 locations) ¾" flush, drain and vent connections shown on LR-M-11 Sheet 2 are nonsafety-related as indicated on the QAD for LR-M-11 Sheet 2. Review of LR-M-11 Sheet 2 identified 50 locations where ¾" capped lines are colored red indicating they are in scope for 10 CFR 54.4(a)(2). Since all 50 of these piping sections are nonsafety-related, may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

f. The capped lines at multiple (17 locations) ¾" flush, drain and vent connections shown on LR-M-11 Sheet 3 are nonsafety-related as indicated on the QAD for LR-M-11 Sheet 3. Review of LR-M-11 Sheet 3 identified 24 locations where ¾" capped lines are colored red indicating they are in scope for 10 CFR 54.4(a)(2). Since all 24 of these piping sections are nonsafety-related, may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

g. The capped lines at multiple (32 locations) ¾" and 1" flush, drain and vent connections shown on LR-M-11 Sheet 4 are nonsafety-related as indicated on the QAD for LR-M-11 Sheet 4. Review of LR-M-11 Sheet 4 identified 33 locations where ¾" and 1" capped lines are colored red indicating they are in scope for 10 CFR 54.4(a)(2). Since all 33 of these piping sections are nonsafety-related, may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

h. The capped lines at multiple (34 locations) ¾" and 1" flush, drain and vent connections shown on LR-M-11 Sheet 5 are nonsafety-related as indicated on the QAD for LR-M-11 Sheet 5. Review of LR-M-11 Sheet 5 identified 40 locations where ¾" and 1" capped lines are colored red indicating they are in scope for 10 CFR 54.4(a)(2). Since all 40 of these piping sections are nonsafety-related, may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

2.3.3.26 Water Treatment and Distribution (WTD) System

a. The capped lines at valves 0001A, 0002A, 0003A, 0005A, 0001B, 0002B, 0003B and 0005B shown on LR-M-78 Sheet 1 are safety-related as indicated on the QAD for LR-M-78 Sheet 1. These lines are discussed above in the Exelon response for Section 2.3.3.4, *"Control Enclosure Ventilation System."*

b. The capped lines at several ¾" vent valves and 1" drain valves shown on LR-M-90 Sheet 1 at multiple locations are nonsafety-related as indicated on the QAD for LR-M-90 Sheet 1. These lines are discussed above in the Exelon response for Section 2.3.3.4, *"Control Enclosure Ventilation System."*

c. The capped lines at several ¾" and 1" vent and drain valves shown on LR-M-90 Sheet 2 at multiple locations are nonsafety-related as indicated on the QAD for LR-M-90 Sheet 2. These lines are discussed above in the Exelon response for Section 2.3.3.4, *"Control Enclosure Ventilation System."*

RAI 2.3.3.8-1

License renewal boundary drawings LR-M-20 Sheets 8 and 14, location F-5, depict ejector casings that are within the scope of license renewal for 10 CFR 54.4(a)(1). However, the ejector casing is not listed in Table 2.3.3-8 as a component type subject to an aging management review (AMR).

Justify the exclusion of the ejector casing component type from LRA Table 2.3.3-8.

Exelon Response

The Emergency Diesel Generator ejector bodies, shown on license renewal boundary drawing LR-M-20 Sheets 8 and 14 at location F-5, have not been excluded from LRA Table 2.3.3-8. The ejector bodies are included in the component type of *"Piping, piping components, and piping elements"* and are evaluated for aging management review in LRA Table 3.3.2-8, *"Emergency Diesel Generator System Summary of Aging Management Evaluation."*

GALL Report Table IX.B defines the standard component term of "*Piping, piping components, piping elements, and tanks*" as a general category which includes "*features of the piping system within the scope of license renewal*." It further provides examples of components included in this category such as "*piping, fittings, tubing, flow elements/indicators, demineralizers, nozzles, orifices, flex hoses, pump casings and bowls, safe ends, sight glasses, spray heads, strainers, thermowells, and valve bodies and bonnets.*" Therefore, the inclusion of ejector bodies in the component type of *"Piping, piping component, and piping elements"* is consistent with the GALL Report.

RAI 2.3.3.8-2

License renewal boundary drawings LR-M-20 Sheets 8 and 14, locations B-4 and D-4, depict turbo charger casings that are within the scope of license renewal for 10 CFR 54.4(a)(1).

However, the turbo charger casing is not listed in Table 2.3.3-8 as a component type subject to an AMR.

Justify the exclusion of the turbo charger casing as component types from LRA Table 2.3.3-8.

Exelon Response

The Emergency Diesel Generator turbocharger casings, shown on license renewal boundary drawing LR-M-20 Sheets 8 and 14 at locations B-4 and D-4, are components subject to aging management review that are listed in LRA Table 2.3.3-8, page 2.3-88 as "Turbocharger Casing."

RAI 2.3.3.8-3

License renewal boundary drawings LR-M-20 Sheets 8 and 14, location F-3, depict exhaust silencer housings that are within the scope of license renewal for 10 CFR 54.4(a)(1). However, the exhaust silencer housing is not listed in Table 2.3.3-8 as a component type subject to an AMR.

Justify the exclusion of the exhaust silencer component type from LRA Table 2.3.3-8.

Exelon Response

The Emergency Diesel Generator exhaust silencer housings and internals, shown on license renewal boundary drawing LR-M-20 Sheets 8 and 14 at location F-3, have not been excluded from LRA Table 2.3.3-8. The exhaust silencer housings and internals are included in the component type of *"Piping, piping components, and piping elements"* and are evaluated for aging management review in LRA Table 3.3.2-8, *"Emergency Diesel Generator System Summary of Aging Management Evaluation."*

GALL Report Table IX.B defines the standard component term of "*Piping, piping components, piping elements, and tanks*" as a general category which includes "*features of the piping system within the scope of license renewal*." It further provides examples of components included in this category such as "*piping, fittings, tubing, flow elements/indicators, demineralizers, nozzles, orifices, flex hoses, pump casings and bowls, safe ends, sight glasses, spray heads, strainers, thermowells, and valve bodies and bonnets.*" Therefore, the inclusion of exhaust silencer housings and internals in the component type of *"Piping, piping component, and piping elements"* is consistent with the GALL Report.

RAI 2.3.3.8-4

License renewal boundary drawings LR-M-20 Sheets 3 and 9, locations D-3 and D-7, depict flame arrestor housings that are within the scope of license renewal for 10 CFR 54.4(a)(1). However, the flame arrestor housing that is not listed in Table 2.3.3-8 as a component type subject to an AMR.

Justify the exclusion of the flame arrestor housing component type from LRA Table 2.3.3-8.

Exelon Response

The flame arrestor housings connected to the diesel oil storage tanks and diesel generator day tanks, shown on license renewal boundary drawing LR-M-20 Sheets 3 and 9 at locations D-3 and D-7, have not been excluded from LRA Table 2.3.3-8. The flame arrestor housings are included in the component type of *"Piping, piping components, and piping elements"* and are evaluated for aging management review in LRA Table 3.3.2-8, *"Emergency Diesel Generator System Summary of Aging Management Evaluation."*

GALL Report Table IX.B defines the standard component term of "*Piping, piping components, piping elements, and tanks*" as a general category which includes "*features of the piping system within the scope of license renewal*." It further provides examples of components included in this category such as "*piping, fittings, tubing, flow elements/indicators, demineralizers, nozzles, orifices, flex hoses, pump casings and bowls, safe ends, sight glasses, spray heads, strainers, thermowells, and valve bodies and bonnets.*" Therefore, the inclusion of flame arrestor housings in the component type of *"Piping, piping component, and piping elements"* is consistent with the GALL Report.

RAI 2.3.3.8-5

LRA Section 2.1.1 states that the in-scope portions of mechanical systems and structures are highlighted in color on the license renewal boundary drawings. For the Emergency Diesel Generator System, the applicant includes the diesel engines within the license renewal scoping boundary.

License renewal boundary drawings LR-M-20 Sheets 3 and 9, location F-5, depict diesel engines 1AG501 and 2AG501 as not being within the scope of license renewal. Although the applicant states in Note 7 that the in-scope fuel oil supply system boundary stops at the fuel injectors of the diesel generator due to the fuel injectors being excluded from aging management review, the license renewal boundary drawings appear to contradict the applicant's methodology for highlighting the in-scope components (the diesel engines) as described in LRA Section 2.1.1.

Justify why the diesel engines depicted on license renewal boundary drawings LR-M-20 Sheets 3 and 9 are indicated as not being within the scope of license renewal.

Exelon Response

License renewal boundary drawing LR-M-20 Sheets 3 and 9 depict the results of license renewal scoping of the diesel fuel oil storage and transfer system, as discussed in LRA Section 2.3.3-8, Emergency Diesel Generator System, Boundary discussion. Note 7 clarifies that the diesel fuel oil supply system boundary stops at the fuel injectors, which are an integral part of the active diesel generator assembly. The box that depicts the diesel engine is not colored green and this indicates that the diesel engine is outside the boundary of the diesel fuel oil storage and transfer system depicted on this drawing. LRA Section 2.3.3-8, Boundary discussion, first paragraph on page 2.3-83 states that the license renewal scoping boundary includes the diesel engines. The Boundary discussion for the diesel fuel oil storage and transfer system, in the fifth paragraph on page 2.3-84 states that the license renewal boundary for the diesel fuel oil storage and transfer system ends at the connection point to the diesel engine.

RAI 2.3.3.12-1

License renewal boundary drawings LR-M-10 Sheets 5 and 10, locations H-2 and H-4, depict the 6" JBD-107/207 and 6" JBD-132/232 lines as being within the scope of license renewal based on the criteria in 10 CFR 54.4(a)(2) with continuations to and from license renewal boundary drawings LR-M-10 Sheets 3 and 8. However, the continuations of these lines on license renewal boundary drawings, LR-M-10 Sheets 3 and 8, are depicted as not being within the scope of license renewal.

Clarify the correct scoping classification of these pipe lines.

Exelon Response

The 6-inch JBD-107/207 and 6-inch JBD-132/232 nonsafety-related cooling water lines shown on boundary drawings LR-M-10 Sheets 5 and 10 are in scope for license renewal based on the criteria in 10 CFR 54.4(a)(2). These lines continue onto boundary drawings LR-M-10 Sheets 3 and 8 at location H-1. The 6-inch lines continued from LR-M-10 Sheets 5 and 10 and shown on LR-M-10 Sheets 3 and 8 are also in scope for license renewal and should be shown highlighted in red up to the tee with the 24-inch JBD-124/224 and 24-inch JBD-102/202 cooling water supply and return headers.

License renewal boundary drawing LR-M-10 Sheet 3, location H-1, will be revised to show the 6-inch JBD-107 cooling water supply to the condenser compartment unit coolers and the 6-inch JBD-132 cooling water return from the condenser compartment unit coolers as in scope up to the tees with the 24-inch cooling water headers. A Note 3 will be added at both tees to indicate that only the piping located within the main condenser compartment is in scope for spatial interaction.

License renewal boundary drawing LR-M-10 Sheet 8, location H-1, will be revised to show the 6-inch JBD-207 cooling water supply to the condenser compartment unit coolers and the 6-inch JBD-232 cooling water return from the condenser compartment unit coolers as in scope up to the tees with the 24-inch cooling water headers. A Note 3 will be added at both tees to indicate that only the piping located within the main condenser compartment is in scope for spatial interaction.

These drawing changes do not require a change to the LRA. The carbon steel piping is included in LRA Table 3.3.2-12, *"Nonsafety-Related Service Water System Summary of Aging Management Evaluation,"* as component type *"Piping, piping components, and piping elements."* No other component types are affected.

RAI 2.3.3.13-1

On license renewal boundary drawing, LR-M-64 Sheet 1, location G-8, the continuation of the pipe line depicted within the scope of license renewal could not be found in any other license renewal boundary drawings.

Locate the continuation line for the above location. If the continuation line cannot be shown on license renewal boundary drawings, then provide additional information describing the extent of the scoping boundary and verify whether or not there are additional AMR component types between the continuation and the termination of the scoping boundary. If the scoping classification of a section of the piping changes over the continuation, provide additional information to clarify the change in scoping classification.

Exelon Response

The Unit 1 Reactor Head Washdown, Unit 1 Reactor Enclosure Washdown, and Unit 2 Reactor Head Washdown drain lines shown on LR-M-64 Sheet 1, location G,H-8 do not continue to any other license renewal boundary drawings. These drain lines include stainless steel piping which originates at stainless steel or carbon steel floor drains within the washdown areas. These leakage boundary components and their materials, environments and aging management programs are already included in LRA Table 3.3.2-13, *"Plant Drainage System Summary of Aging Management Evaluation,"* within the component type of *"Piping, piping components, and piping elements."* No additional aging management review is required.

RAI 2.3.3.14-1

LRA Section 2.1 describes the applicant's scoping methodology, which specifies how systems or components were determined to be included in scope of license renewal. The staff confirms the inclusion of all components subject to AMR by reviewing the results of the screening of components within the license renewal boundary.

On license renewal boundary drawing LR-M-59 Sheet 1, location C-6, the applicant depicts Note 5, which states "This piping is included in scope out to the seismic anchor credited for structural support of the safety-related piping located as shown. The nonsafety-related piping beyond this anchor location is not in scope." However, the 1" JCD-109 pipe continues in red, designating the piping as being within the scope of license renewal for 10 CFR 54.4(a)(2), from Note 5 to the end of the pipe and including the drawing continuation marker to drawing LR-M-59 Sheet 2, at location F-1. The continuation marker on Sheet 2 also shows the pipe still in scope for 10 CFR 54.4(a)(2) and has another Note 5, the same as Sheet 1, where the transition is actually made from red to black to indicate the 1" JCD-109 pipe continuation changed to not being in scope for license renewal. For LGS, Unit 2, LRA drawing LR-M-59 Sheet 3, location C-6, the 1" JCD-209 pipe has the same Note 5 and there is an immediate transition from red to black, so the remainder of the pipe up to and including the continuation marker is no longer in scope as the Note 5 indicates. There also is no duplicate Note 5 on Sheet 4.

Clarify why the 1" JCD-109 pipe scope does not agree with Note 5 on LRA drawing LR-M-59 Sheet 1. Also clarify why there are differences in scoping between the 1" JCD-109 pipeline on Sheets 1 and 2 and the 1" JCD-209 pipeline on Sheets 3 and 4.

Exelon Response

Note 5 on license renewal boundary drawing LR-M-59 Sheet 1, location C-6 is a misleading reference and will be deleted. The scoping boundary for the LGS Unit 1 one-inch JCD-109 line extends onto LR-M-59 Sheet 2, location F-1 where Note 5 is appropriately referenced. This change does not affect the system scoping boundary for the Primary Containment Instrument Gas System as described in LRA Section 2.3.3.14 or the LRA Table 3.3.2-14, *"Summary of Aging Management Evaluation for the Primary Containment Instrument Gas System."* This is a change to license renewal boundary drawing LR-M-59 Sheet 1, and license renewal boundary drawing LR-M-59 Sheet 1 will be revised.

The scoping boundary for the LGS Unit 2 one-inch JCD-209 line is correctly shown on license renewal boundary drawing LR-M-59 Sheet 3, location C-6. The difference between the Unit 1 and Unit 2 scoping boundaries is due to the location of the anchor credited for structural support. The scoping boundary for the Unit 2 one-inch JCD-209 line does not extend onto license renewal boundary drawing LR-M-59 Sheet 4.

RAI 2.3.3.14-2

License renewal boundary drawing LR-M-59 Sheet 3, location H-6, depicts a line not highlighted within the scope of license renewal. However, the line is connected to a continuation marker from drawing LR-M-42 Sheet 3, location A-3, which depicts the continuation marker to be highlighted green and in scope for 10 CFR 54.4(a)(1).

Clarify the scoping classification of the pipe line.

Exelon Response

The continuation line to PDS-059-206B on license renewal boundary drawing LR-M-59 Sheet 3, location H-6 from LR-M-42 Sheet 3, location A-3 should have been shown as within the scope of license renewal for 10 CFR 54.4(a)(1).

This change does not affect the system scoping boundary for the Primary Containment Instrument Gas System as described in LRA Section 2.3.3.14 or the LRA Table 3.3.2-14 *"Summary of Aging Management Evaluation for the Primary Containment Instrument Gas System."* This is a change to license renewal boundary drawing LR-M-59 Sheet 3, and license renewal boundary drawing LR-M-59 Sheet 3 will be revised.

RAI 2.3.3.17-1

License renewal boundary drawings LR-M-26 Sheets 1 and 7, location C-2, and LR-M-26 Sheet 4, location B-7, depict sample chambers in Detail K that are within the scope of license renewal for 10 CFR 54.4(a)(2), but are not listed in Table 2.3.3-17 as a component type subject to an AMR.

Justify the exclusion of the sample chamber component type from LRA Table 2.3.3-17.

Exelon Response

The sample chambers shown in Detail K on license renewal boundary drawing LR-M-26, Sheets 1 and 7, location C-2, and LR-M-26, Sheet 4, location B-7 have not been excluded from LRA Table 2.3.3-17, *"Process Radiation Monitoring System Component Subject to Aging Management Review."* The sample chambers are included in the component type of *"Piping, piping components, and piping elements"* and are evaluated for aging management in LRA Table 3.3.2-17, *"Process Radiation Monitoring System Summary of Aging Management Review."*

GALL Report Table IX.B defines the standard component term of "*Piping, piping components, piping elements, and tanks*" as a general category which includes "*features of the piping system within the scope of license renewal*." It further provides examples of components included in this category such as "*piping, fittings, tubing, flow elements/indicators, demineralizers, nozzles, orifices, flex hoses, pump casings and bowls, safe ends, sight glasses, spray heads, strainers, thermowells, and valve bodies and bonnets.*" Therefore, the inclusion of sample chambers in the component type of *"Piping, piping component, and piping elements"* is consistent with the GALL Report.

During the evaluation of this RAI, errors were identified in LRA Table 3.3.2-17, *"Process Radiation Monitoring System Summary of Aging Management Evaluation."* These include:

- The environment of treated water was incorrectly applied to the nonsafety-related liquid process monitor components shown in Detail K on license renewal boundary drawing LR-M-26, Sheets 1 and 7, location C-2. The correct environment is closed cycle cooling water.
- The environments of treated water and air/gas-wetted were incorrectly applied to the process radiation monitor heat exchanger/sample cooler shown in Detail E on license renewal boundary drawing LR-M-26, Sheets 2 and 8, location G-8. The applicable environment is closed cycle cooling water. Only the shell side of the process radiation monitor heat exchanger/sample cooler is in scope for Leakage Boundary. Additionally,

this component is addressed for aging management in LRA Table 3.3.2-2, *"Closed Cooling Water System Summary of Aging Management Evaluation."*

- There are no carbon steel *"Piping, piping components, piping elements"* or *"Valve Body"* component types in the Process Radiation Monitoring System with a Leakage Boundary or Pressure Boundary intended function.
- Stainless steel *"Piping, piping components, and piping elements and Valve Body"* component types with a leakage boundary intended function also include an air/gas-wetted internal environment.

LRA Section 3.3.2.1.17, Table 3.3.2-17, Table 3.3.1, and Table 2.3.3-17 are revised, as shown in Enclosure B.

RAI 2.3.3.17-2

License renewal boundary drawing LR-M-26 Sheet 5, location E-3, depicts filter and detector housings in Detail G that are within the scope of license renewal for 10 CFR 54.4(a)(1), but are not listed in Table 2.3.3-17 as a component type subject to an AMR.

Justify the exclusion of the filter and detector housing component types from LRA Table 2.3.3-17.

Exelon Response

The filter and detector housings as shown on license renewal boundary drawing LR-M-26; Sheet 5 location E-3, Detail G, have not been excluded from LRA Table 2.3.3-17, *"Process Radiation Monitoring System Component Subject to Aging Management Review."* The filter and detector housings have been included in the component type of *"Piping, piping components, and piping elements"* and are evaluated for aging management in LRA Table 3.3.2-17, *"Process Radiation Monitoring System Summary of Aging Management Review."*
GALL Report Table IX.B defines the standard component term of "*Piping, piping components, piping elements, and tanks*" as a general category which includes "*features of the piping system within the scope of license renewal*." It further provides examples of components included in this category such as "*piping, fittings, tubing, flow elements/indicators, demineralizers, nozzles, orifices, flex hoses, pump casings and bowls, safe ends, sight glasses, spray heads, strainers, thermowells, and valve bodies and bonnets.*" Therefore, the inclusion of filter and detector housings in the component type of *"Piping, piping component, and piping elements"* is consistent with the GALL Report.

RAI 2.3.3.18-1

License renewal boundary drawings LR-M-23 Sheets 4 and 7, location H-4, depict a continuation line from the feedwater to reactor 10 CFR 54.4(a)(2) pipelines respectively to license renewal boundary drawings LR-M-06 Sheets 3 and 6, location G-8, where the pipeline continuations are shown excluded from scope of license renewal.

Clarify the scoping classification of these pipe lines.

Exelon Response

The feedwater sample lines shown on license renewal boundary drawing LR-M-06; Sheets 3 and 6 location G-8, originate at the main feedwater piping located within the Turbine Enclosure. The sample lines located within the Turbine Enclosure are in an area where spatial interaction is not a concern; therefore, these lines are correctly shown as not in scope on license renewal

boundary drawing LR-M-06, Sheets 3 and 6. The sample line continuation shown on license renewal boundary drawing LR-M-23, Sheets 4 and 7, location H-4 terminates within the Reactor Enclosure. The sample lines located within the Reactor Enclosure are in an area where spatial interaction is a concern; therefore, these lines are correctly shown as in scope on license renewal boundary drawing LR-M-23, Sheets 4 and 7.

RAI 2.3.3.22-1

License renewal boundary drawing LR-M-13 Sheet 2, locations D-2 and E-7,depicts 1½" JBD-419 lines as being within the scope of license renewal based on the criteria in 10 CFR 54.4(a)(2), with continuations to license renewal boundary drawing LR-M-23, Sheet 7. However, the continuations of these lines on license renewal boundary drawing LR-M-23, Sheet 7 are shown as not within the scope of license renewal.

Clarify the scoping classification of these pipe lines.

Exelon Response

The continuation of the Closed Cooling Water System lines from license renewal boundary drawing LR-M-13 Sheet 2, locations D-2 and E-7 as shown on license renewal boundary drawing LR-M-23 Sheet 7, location E-4 should have been shown as within the scope of license renewal for spatial interaction under 10 CFR 54.4(a)(2) up to the Reactor Enclosure Sample Station. Closed Cooling Water System piping within the sample station enclosure is not in scope for 10 CFR 54.4(a)(2). As discussed in Note 4 of LR-M-23 Sheet 7, piping and components within the sample station enclosure do not have the potential for spatial interaction.

This change does not affect the system scoping boundary for the Closed Cooling Water System as described in LRA Section 2.3.3.2 or the LRA Table 3.3.2-2 *"Closed Cooling Water System Summary of Aging Management Evaluation."* This is a change to license renewal boundary drawing LR-M-23 Sheet 7, and license renewal boundary drawing LR-M-23 Sheet 7 will be revised.

RAI 2.3.3.22-2

License renewal boundary drawing LR-M-13, Sheet 1, locations D-2 and D-4, shows the 1½" JBD-319 lines to be within the scope of license renewal for 10 CFR 54.4(a)(2), with continuations to and from the license renewal boundary drawing LR-M-23, Sheet 4. However the continuations of these lines on drawing LR-M-23, Sheet 4 are shown as not within the scope of license renewal.

Clarify the scoping classification of these pipe lines.

Exelon Response

The continuation of the Closed Cooling Water System lines from license renewal boundary drawing LR-M-13 Sheet 1, locations D-2 and D-4 as shown on license renewal boundary drawing LR-M-23 Sheet 4, location E-4 should have been shown as within the scope of license renewal for spatial interaction under 10 CFR 54.4(a)(2) up to the sample station enclosure. Closed Cooling Water System piping within the sample station enclosure is not in scope for 10 CFR 54.4(a)(2). As discussed in Note 4 of LR-M-23 Sheet 4, piping and components within the sample enclosure do not have the potential for spatial interaction.

This change does not affect the system scoping boundary for the Closed Cooling Water System as described in LRA Section 2.3.3.2. This change affects license renewal boundary drawing LR-M-23 Sheet 4, and license renewal boundary drawing LR-M-23 Sheet 4 will be revised.

LRA Table 3.3.2-2 *"Closed Cooling Water System Summary of Aging Management Evaluation"* and LRA Section 3.3.2.1.2 for the Closed Cooling Water System are revised to add copper alloy with less than 15% zinc valves to license renewal scope for spatial interaction under 10 CFR 54.4(a)(2) and aging management review, as shown in Enclosure B.

RAI 2.3.4-1

For the license renewal boundary drawing locations identified in the table below, the staff could not determine the basis for the change in scoping criteria from 10 CFR 54.4 (a)(1) to 10 CFR 54.4 (a)(2).

Nonsafety-related/Safety-Related Interface Item	License Renewal Boundary Drawing Number & Location	Explanation of Issue
2.3.4.2 Condensate System		
a	LR-M-51 Sheet 1, Multiple locations	At all test connections.
b	LR-M-52 Sheet 1, Multiple locations	At valves 1F041A, 1F041B, 1021B, 1075A, 1075B, 1076A and 1076B.
c	LR-M-52 Sheet 2, locations F-3 and G-3	¾" SBD-152 drain out of pumps 1AP256 and 1BP256.
d	LR-M-52 Sheet 3, locations E-7 and F-7	At valves 2F041A and 2F041B.
e	LR-M-52 Sheet 4, Multiple locations	At valves 2004, 2023A, 2023B, 2027B, 2027C, 2027D, 2032D, 2066, 2069, 2075A, 2075B, 2076, 2082, 2083, 2084, 2085, 2086, 2087 and 2088.
2.3.4.6 Main Steam System		
a	LR-M-01 Sheet 1, location C-6	At valve 1030.
b	LR-M-01 Sheet 3, location A-6	At valve 2030.
c	LR-M-41 Sheet 1, location A-6	At valves 1038 and 1051.
d	LR-M-41 Sheet 2, locations E-4, D-3, D-1 and G-8	At valves 1066A, 1067A, 1068A, 1069A, 1070A, 1071A, 1072A, 1073A, 1037, 1040, and 1034E.
e	LR-M-41 Sheet 4, locations A-6 & B-5 thru D-5	At valves 2038, 2F082B, 2063 and 2F083A.
f	LR-M-41 Sheet 5, locations E-4, D-3, D-1 and G-8	At valves, 2037, 2070, 2034E.

g	LR-M-49 Sheet 1, Multiple locations	At valves 1F053, 1F082, 1F083, 1F085, 1004, 1005, 1020, 1026, 1042, 1043, 1048A, 1048B, 1048B, 1048D, 1049B, 1049B, 1049B, 1049D, and 1055.
h	LR-M-50 Sheet 1, location G-6	At valve 1043.
i	LR-M-50 Sheet 2, location H-6	At valve 2043.
j	LR-M-55 Sheet 1, Multiple locations	At valves 1F013, 1F015, 1F044, 1F056, 1F065, 1F090, 1F091, 1F092, 1030, 1034, 1036, 1037, 1040, 1041, 1050, 1053, 1054, 1056, 1057, 1066, 1067, 1070A, 1070B, 1070C, 1070D, 1071A, 1071B, 1071C, and 1071D, 1045.

Clarify the scoping classification of the 10 CFR 54.4(a)(2) pipe lines identified in the above table.

Exelon Response

Quality Assurance Diagrams (QADs) are the source documents that define the safety classification for sections of piping downstream of vent, drain test and flush valves to caps that are the subject of this request. The QADs show the transition from safety-related to nonsafety-related piping with the safety-related piping shown bolded. A Piping and Instrumentation Diagram (P&ID) provides the bases for each license renewal drawing, and a QAD exists for each P&ID that includes safety-related piping components. Piping and components that perform or support a safety-related function are in scope based on 10 CFR 54.4 (a)(1) criteria. Nonsafety-related piping components within the Reactor Enclosure, and Primary Containment that contain fluid are included in scope for potential spatial interaction based on the criteria in 10 CFR 54.4(a)(2) as discussed in LRA Section 2.1. The scoping classification of the piping lines identified in the above table are clarified as within the scope of license renewal based on the criteria in 10 CFR 54.4 (a)(1) or 10 CFR 54.4(a)(2), using the QADs as the bases for the safety classification as described below.

2.3.4.2 Condensate System

a. The capped lines at multiple test connections shown on LR-M-51 Sheet 1 are nonsafety-related as indicated on the QAD for LR-M-51 Sheet 1. Since these piping sections may contain moisture and are within the Reactor Enclosure or Primary Containment they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

b. The capped lines at valves 1F041A, 1F041B, 1021B, 1075A, 1075B, 1076A and 1076B shown on LR-M-52 Sheet 1 are nonsafety-related as indicated on the QAD for LR-M-52 Sheet 1. Since these piping sections may contain moisture and are within the Reactor Enclosure or Primary Containment they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

c. The ¾" SBD-152 drain out of pumps 1AP256 and 1BP256 shown on LR-M-52 Sheet 2 are nonsafety-related as indicated on the QAD for LR-M-52 Sheet 2. Since these piping

sections may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

d. The capped lines at valves 2F041A and 2F041B shown on LR-M-52 Sheet 3 are nonsafety-related as indicated on the QAD for LR-M-52 Sheet 3. Since these piping sections may contain moisture and are within Primary Containment they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

e. The capped lines at valves 2004, 2023A, 2023B, 2027B, 2027C, 2027D, 2032D, 2066, 2069, 2075A, 2075B, 2076, 2082, 2083, 2084, 2085, 2086, 2087 and 2088 shown on LR M-52 Sheet 4 are nonsafety-related as indicated on the QAD for LR-M-52 Sheet 4. Since these piping sections may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

2.3.4.6 Main Steam System

a. The line downstream of valve 1030 shown on LR-M-01 Sheet 1 is nonsafety-related as indicated on the QAD for LR-M-01 Sheet 1. Since this piping section may contain moisture and is located in an area of the Turbine Enclosure in the vicinity of safety-related components it is in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

b. The line downstream of valve 2030 shown on LR-M-01 Sheet 3 is nonsafety-related as indicated on the QAD for LR-M-01 Sheet 3. Since this piping section may contain moisture and is located in an area of the Turbine Enclosure in the vicinity of safety-related components it is in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

c. The capped lines at valves 1038 and 1051 shown on LR-M-41 Sheet 1 are nonsafety-related as indicated on the QAD for LR-M-41 Sheet 1. Since these piping sections may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

d. The capped lines at valves 1066A, 1067A, 1068A, 1069A, 1070A, 1071A, 1072A, 1073A, 1037, 1040 and 1034E shown on LR-M-41 Sheet 2 are nonsafety-related as indicated on the QAD for LR-M-41 Sheet 2. Since the piping sections at valves 1066A, 1067A, 1068A, 1069A, 1070A, 1071A, 1072A, 1073A, 1037 and 1040, may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria. The Primary Containment Instrument Gas system piping section between valve 1034E and the cap does not have the potential to contain moisture, is not in scope for 10 CFR 54.4(a)(2) spatial interaction criteria and should not have been colored red. License renewal boundary drawing LR-M-41 Sheet 2 will be revised to color the capped piping downstream of valve 1034E black.

e. The capped lines at valves 2038, 2F082B, 2063 and 2F083A shown on LR-M-41 Sheet 4 are nonsafety-related as indicated on the QAD for LR-M-41 Sheet 4. Since these piping sections may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria.

f. The capped lines at valves 2037, 2070 and 2034E shown on LR-M-41 Sheet 5 are nonsafety-related as indicated on the QAD for LR-M-41 Sheet 5. Since the piping sections at valves 2037 and 2070 may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria. The Primary Containment Instrument Gas system piping section between valve 2034E and the cap does not have the potential to contain moisture, is not in scope for 10 CFR 54.4(a)(2) spatial interaction criteria

and should not have been colored red. License renewal boundary drawing LR-M-41 Sheet 5 will be revised to color the capped piping downstream of valve 2034E black.

g. The capped lines at valves 1F053, 1F082, 1F083, 1F085, 1004, 1005, 1020, 1026, 1042, 1043, 1048A, 1048B, 1048C, 1048D, 1049A, 1049B, 1049C, 1049D and 1055 shown on LR-M-49 Sheet 1 are nonsafety-related as indicated on the QAD for LR-M-49 Sheet 1. Since these piping sections may contain moisture and are within the Reactor Enclosure they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria. Since the piping between valve 1F083 and the cap does not perform or support a 10 CFR 54.4(a)(1) intended function, it should not have been colored green. License renewal boundary drawing LR-M-49 Sheet 1 will be revised to color the capped piping downstream of valve 1F082 red.

h. The capped line at valve 1043 shown on LR-M-50 Sheet 1 is safety-related as indicated on the QAD for LR-M-50 Sheet 1. Therefore, this line is within the scope of license renewal based on the criteria in 10 CFR 54.4(a)(1) as shown on LR-M-50 Sheet 1.

i. The capped line at valve 2043 shown on LR-M-50 Sheet 2 is safety-related as indicated on the QAD for LR-M-50 Sheet 2. Therefore, this line is within the scope of license renewal based on the criteria in 10 CFR 54.4(a)(1) and should not have been colored red. License renewal boundary drawing LR-M-50 Sheet 2 will be revised to color the capped piping downstream of valve 2043 green.

j. The capped lines at valves 1F013, 1F015, 1F044, 1F056, 1F065, 1F090, 1F091, 1F092, 1030, 1034, 1036, 1037, 1040, 1041, 1050, 1053, 1054, 1056, 1057, 1066, 1067, 1070A, 1070B, 1070C, 1070D, 1071A, 1071B, 1071C, 1071D and 1045 shown on LR-M-55 Sheet 1 are nonsafety-related as indicated on the QAD for LR-M-55 Sheet 1. Since these piping sections may contain moisture and are within the Reactor Enclosure or Primary Containment they are in scope for 10 CFR 54.4(a)(2) spatial interaction criteria. Since the piping between valves 1F091 and 1037 and the downstream caps do not perform or support a 10 CFR 54.4(a)(1) intended function, they should not have been colored green. License renewal boundary drawing LR-M-55 Sheet 1 will be revised to color the capped piping downstream of valves 1F091 and 1037 red.

RAI 2.3.4.3-1

License renewal boundary drawings LR-M-07 Sheets 1 and 3, location H-2, depict air inlets with screens that are within the scope of license renewal for 10 CFR 54.4(a)(2), but are not listed in Table 2.3.4-3 as a component type subject to an AMR.

Justify the exclusion of the air inlet with screen component type from LRA Table 2.3.4-3.

Exelon Response

The screens on the air inlets as shown on license renewal boundary drawings LR-M-07; Sheets 1 and 3 locations H-2 and G-2, are not in scope for license renewal. The air inlet screens are not included LRA Table 2.3.4-3, *"Condenser and Air Removal System Component Subject to Aging Management Review."* The screens are installed to prevent foreign material from entering the open pipelines. The piping on which the screens are installed serves to admit air to the main condensers to break condenser vacuum in support of refueling outages and maintenance activities. The piping is in scope for license renewal with a leakage boundary intended function. The piping has the potential for spatial interaction because the piping is normally filled with water to provide a seal against seat leakage through the closed valves HV-*42, HV-*43, HV-*44 and HV-*45 during normal plant operation. Filling the lines to establish a

water seal is accomplished via manual operation of the ¾-inch condensate makeup valves and the valves are maintained closed following the fill operations. The screens do not perform a license renewal structural support or leakage boundary intended function, and therefore, are not in scope for license renewal.
Drawing LR-M-07 Sheets 1 and 3 will be revised to add a note clarifying that the air inlet screens are not in scope for license renewal. No change to the LRA is required.

RAI 2.3.4.6-1

On license renewal boundary drawing, LR-M-05 Sheet 1, locations G-3, G-4 and G-6, the continuation of the 1 ½" "Bearing Drain to Oily Waste" pipe from the condenser could not be found on the following license renewal boundary drawings because the drawings were not included in the license renewal boundary drawings package:

- M-19 Sheet 3
- M-19 Sheet 6

Provide the license renewal boundary for the 1 ½" "Bearing Drain to Oily Waste" pipe for the license renewal boundary drawings described above. If the continuation line cannot be shown on these license renewal boundary drawings, then provide additional information describing the extent of the scoping boundary and verify whether or not there are additional AMR component types between the continuation and the termination of the scoping boundary. If the scoping classification of a section of the piping changes over the continuation, provide additional information to clarify the change in scoping classification.

Exelon Response

The 1 ½-inch Bearing Drain to Oily Waste piping from the condenser as shown on LR-M-05 Sheet 1, locations G-3, G-4 and G-6, continues on to the oily waste drain interceptor tank shown on plant P&ID M-19 Sheet 3. The drain piping is a gravity drain with no intervening valves between the condenser and the oily waste interceptor tank. The oily waste interceptor tank is located in the Turbine Enclosure in an area that is outside the main condenser compartment and is not in scope for license renewal since there is no potential for spatial interaction with safety-related components. The oily waste lines should have changed from red highlight to black prior to the continuation arrow at all three locations on LR-M-05 Sheet 1, and a Note 3 should have been added at each of these locations. There is no piping in scope for license renewal on plant P&ID M-19 Sheet 3.
This same condition exists on LR-M-05 Sheet 3, locations G-3, G-4 and G-6, where the oily waste drain piping is shown to continue to plant P&ID M-19 Sheet 6. The oily waste lines should have changed from red highlight to black prior to the continuation arrow at all three locations on LR-M-05 Sheet 3, and a Note 3 should have been added at each of these locations. There is no piping in scope for license renewal on plant P&ID M-19 Sheet 6.

LR-M-05 Sheet 3 and Sheet 6 will be revised to show the transition from in scope piping to piping not in scope for the three oily waste drain pipes, and a Note 3 will be added at each location to describe the basis for the change from red to black.

RAI 2.3.4.7-1

Drawing LR-M-07 Sheet 2, location F-6, shows in scope pipeline 1" HBD-359, however the continuation on this same drawing at location B-4 shows this pipeline as not in scope.

Clarify the scoping boundary of this pipe section.

Exelon Response

LGS license renewal boundary drawing LR-M-07 Sheet 2 shows a 1-inch loop seal drain pipe HBD-359 at location F-6 that continues at location B-4. This drain line is in scope for license renewal and the in scope designation should continue to the piping at location B-4. Further review indicates that piping downstream of valve 1155 at location B-4 should also be in scope for potential spatial interaction since this piping is located in the main condenser compartment.

LR-M-07 Sheet 2 will be revised to include the carbon steel piping and carbon steel valve 1155 at location B-4. Specifically, the in scope piping will include the 1-inch HBD-359 piping downstream of valve 1155 connecting to 3-inch HBD-359. The 3-inch HBD-359 line to the condensate drain tank, continuing onto LR-M-05 Sheet 2 will also be shown to be in scope for license renewal. A Note 3 will be added at the transition location from in scope to not in scope.

LR-M-05 Sheet 2 will be revised at location B-2 to show the 3-inch HBD-359 piping from LR-M-07 Sheet 2, location B-4, as in scope for license renewal, and Note 3 will be removed from that location.

These boundary drawing revisions do not require a change to the LRA. The affected piping is carbon steel and is included in LRA Table 3.4.2-7, *"Main Turbine Summary of Aging Management Evaluation,"* as component type *"Piping, piping components, and piping elements."* Valve 1155 is also carbon steel and is included in Table 3.4.2-7 as component type *"Valve Body."* No other component types are affected by these drawing revisions.

RAI 2.3.4.7-2

License renewal boundary drawings LR-M-07 Sheets 2 and 4, location E-7, depict drain pipelines 1" HBD-359, and 1" HBD-459 within the scope of license renewal for 10 CFR 54.4(a)(2). However, license renewal boundary drawings LR-M-06 Sheets 2 and 5, location D-8, depict the continuation lines as not being within the scope of license renewal.

Clarify the scoping boundaries for the pipe lines.

Exelon Response

LGS license renewal boundary drawings LR-M-07 Sheets 2 and 4, location E-7, depict drain piping from the reactor feedwater pump (RFP) turbine shaft steam seals. These drain pipes (1-inch HBD-359 for Unit 1 and 1-inch HBD-459 for Unit 2), drain the steam seal condensate to the RFP Turbine Steam Exhaust duct as shown on LR-M-06 Sheets 2 and 5, location D-8. Further review indicates that the 1-inch drain piping to the RFP turbine exhaust duct and an additional portion of RFP turbine exhaust duct should have been shown as in scope for license renewal because it is located in the main condenser compartment and has the potential for spatial interaction with safety-related components.
In the discussions below, (*) indicates that the component is associated with equipment trains "A", "B", and "C".

LR-M-06 Sheet 2 will be revised to show the 1-inch drain line, HBD-359, from LR-M-07 Sheet 2, location E-7, to the RFP turbine exhaust duct as in scope for license renewal for potential spatial interaction. In addition, RFP turbine exhaust duct, downstream of the expansion joint, XJ-116*, will be shown in scope up to valve HV-116* for the potential for spatial interaction. A portion of the 2-inch HBD-382 vent piping and a portion of the 1-inch HBD-382 drain piping at location C-8 will also be shown as in-scope. However, the vent and drain valves, 1032* and 1031* respectively, and downstream piping are not in scope since they are located outside of the main

condenser compartment and do not have the potential for spatial interaction. Note 3 will be added at the locations where the piping transitions from in scope to not in scope.

LR-M-06 Sheet 5 will be revised to show the 1-inch line, HBD-459, from LR-M-07 Sheet 4, location E-7, to the RFP turbine exhaust duct as in scope for license renewal for potential spatial interaction. In addition, RFP turbine exhaust duct, downstream of the expansion joint, XJ-216*, will be in scope up to valve HV-216* for the potential for spatial interaction. A portion of the 2-inch HBD-482 vent piping and a portion of the 1-inch HBD-482 drain piping at location C-8 will also be shown as in-scope. However, the vent and drain valves, 2032* and 2031* respectively, and downstream piping are not in scope since they are located outside of the main condenser compartment and do not have the potential for spatial interaction. Note 3 will be added at the locations where the piping transitions from in scope to not in scope.

The above changes in the boundary drawings do not require any changes to the LRA. The additional piping from LR-M-07 Sheets 2 and 4 is carbon steel and is included in LRA Table 3.4.2-7, *"Main Turbine Summary of Aging Management Evaluation,"* in the *"Piping, piping components, and piping elements"* component type. The RFP turbine exhaust duct is fabricated from welded carbon steel plate and the attached vent and drain lines, shown on LR-M-06 Sheets 2 and 5 are also carbon steel and are included in LRA Table 3.4.2-5, *"Feedwater Summary of Aging Management Evaluation,"* in the *"Piping, piping components, and piping elements"* component type. No other component types are affected by this revision to the LR-M-06 Sheets 2 and 5 boundary drawings.

RAI B.2.1.33-2

Background

GALL Report Aging Management Program (AMP) XI.S4, "10 CFR Part 50 Appendix J" program, in “detection of aging effects,” program element states that while the calculation of leakage rates and satisfactory performance of containment leakage rate testing demonstrates the leak-tightness and structural integrity of the containment, it does not by itself provide information that would indicate that aging degradation has initiated or that the capacity of the containment may have been reduced. The NRC through two Information Notices (INs) identified conditions that could impact leak tightness and aging degradation of the containment boundary pressure-retaining systems and components (SCs) by line vibrations and other external loadings. Information Notices, IN 2005-23 “Vibration Induced Degradation of Butterfly Valves” and IN 2006-15 “Vibration Induced Degradation and Failure of Safety-Related Valves,” have been issued to plant's describing circumstances which aside from valve malfunctioning and leakage could also include accelerated aging, degradation, cracking, and loss of function in various systems penetrating the containment, including seals and gaskets the condition of which are to be monitored by the 10 CFR Part 50, Appendix J program.

Issue

During the audit a search of the plant’s operating experience database indicated that Limerick Generating Station’s (LGS), Unit 2 main steam isolation valve (MSIV) experienced vibration and or shuddering. Although the staff noted that the issue was resolved, the staff discussed with the applicant that such vibrations within proximity to the containment boundary could damage pressure-retaining components. The staff referenced the above INs and further noted to the applicant that effects of vibration could impact the integrity of SCs associated with Type B and C tests, including the inspection intervals of such components.

Request

Discuss how IN 2005-23 and IN 2006-15 have been dispositioned and how the 10 CFR Part 50, Appendix J program will account for the recommendations in those INs for potentially affected SCs that could potentially compromise the containment pressure boundary integrity during the period of extended operation.

Exelon Response

Information Notice (IN) 2005-23 was evaluated for applicability to LGS in December 2006. IN 2005-23 identifies the issue of vibration induced degradation of butterfly valves in water systems. LGS UFSAR Table 6.2-17, "Containment Penetration Data," identifies containment penetrations X-25, X-26, X-201A and X-202 as the only LGS penetrations that use butterfly valves for containment isolation valves. These penetrations are for the drywell and suppression pool purge supply and exhaust piping, which is an air environment. Therefore, these butterfly valves are not susceptible to the vibration induced degradation experienced by butterfly valves in water systems identified in Information Notice 2005-23.
IN 2006-15 was evaluated for applicability to LGS in April 2007. IN 2006-15 identifies the issue of vibration-induced degradation and failure of safety-related valves. It cites specific examples of failures and discusses initiatives to preclude valve failures such as identifying components or sub-components that could be susceptible to vibration-induced stress and wear and evaluating and inspecting those components on a schedule consistent with the overall risk significance associated with a failure. This is addressed in Exelon's preventive maintenance process which classifies components based on criticality and service and specifies inspections and inspection frequencies as appropriate. As discussed in Exelon's response to RAI B.1.4-1, operating experience, such as vibration-induced degradation of valves cited in the Information Notice, will be evaluated during the period of extended operation against aging management activities, including those activities performed by the 10 CFR Part 50 Appendix J program.

RAI B.2.1.33-3

Background

GALL Report AMP XI.S4, “10 CFR Part 50, Appendix J,” in its “scope of program,” program element states that the scope of the program includes all containment boundary pressure-retaining SCs. The Updated Final Safety Analysis Report (UFSAR) lists the containment components (penetrations and valves) subject to Type B or C testing as required by 10 CFR Part 50, Appendix J. The UFSAR also states that the Technical Requirements Manual (TRM) contains the plant’s testing requirements. The TRM as well has a list of the components subject to 10 CFR Part 50, Appendix J testing.

Issue

During the audit the staff noted a condition report which stated that there are discrepancies between the UFSAR and the TRM documentation on implementing procedures and testing for the 10 CFR Part 50 Appendix J testing. Although these differences in testing procedures are being tracked by the applicant, it is unclear to the staff for the “scope of program,” program element, which document, the UFSAR or the TRM, the applicant will use for testing of SCs during the period of extended operation to meet the recommendations for the 10 CFR Part 50, Appendix J program.

Request

1. State which document, UFSAR or the TRM, will be used for testing of SCs during the period of extended operation to meet the “scope of program,” program element of 10 CFR Part 50, Appendix J program.

2. Update the LRA B.2.1.33 10 CFR Part 50, Appendix J program to indicate the document to be followed during the implementation of the 10 CFR Part 50 Appendix J program testing.

Exelon Response

1. Neither the Updated Final Safety Analysis Report (UFSAR) nor the Technical Requirements Manual (TRM) will be used for testing of SCs during the period of extended operation to meet the “scope of program,” program element of the 10 CFR Part 50, Appendix J program. Testing is performed in accordance with plant test procedures which are based on the licensing basis described in the LGS UFSAR and TRM.

   The condition report referred to in the "Issue" statement above identified a discrepancy within the UFSAR, TRM and test procedure regarding the ILRT valve alignment associated with LGS Unit 1 containment penetration X-230B isolation valve HV-061-102, which is shown on license renewal boundary drawing LR-M-61, Sheet 1, location H-4. UFSAR Table 6.2-17, TRM Table 3.6.3-1 and the ILRT test procedure correctly identify that the required position of HV-061-102 during the ILRT is "closed." UFSAR Table 6.2-25 incorrectly identified that the required position of HV-061-102 during the ILRT is "open." UFSAR Table 6.2-25 has been revised to identify that the required position of HV-061-102 during the ILRT is "closed," consistent with UFSAR Table 6.2-17, TRM Table 3.6.3-1 and the ILRT test procedure.

2. 10 CFR Part 50 Appendix J program testing is performed using test procedures based on the licensing basis described in the LGS UFSAR and TRM. The LRA Appendix B program description for B.2.1.33 is revised as shown in Enclosure B to indicate that 10 CFR Part 50 Appendix J program testing is performed using plant procedures.

RAI 4.1-2

Background and Issue:

10 CFR 54.21(c) indicates that license renewal applicants must include a list of time-limited aging analyses (TLAA), as defined in 10 CFR 54.3 and the TLAA must be dispositioned in accordance with 10 CFR 54.21(c)(1). The response to RAI BWRVIP-1, in a letter dated February 15, 2012, included a new Appendix C to the LGS LRA to address action items in all applicable BWRVIP reports credited for aging management.

License Renewal Action Item No. 14 for BWRVIP-74-A states:

> Components that have indications that have been previously analytically evaluated in accordance with sub-section IWB-3600 of Section XI to the ASME Code until the end of the 40-year service period shall be re-evaluated for the 60-year service period corresponding to the LR term.

A commitment (Commitment No. 47) was provided in response to Action Item No. 14, to re-evaluate the flaw in the LGS, Unit 1 reactor pressure vessel (RPV) nozzle to safe-end weld

VRR-1RD-1A-N2H in accordance with ASME Code Section XI, subsection IWB-3600 for the 60-year service period corresponding to the license renewal term.

The response did not include a justification of why this analysis was not identified as a TLAA in the LRA in accordance with 10 CFR 54.21(c)(1). In addition, the commitment to perform the analysis at a later date does not demonstrate an adequate evaluation of the TLAA.

Request:

Clarify how the flaw evaluation of the LGS, Unit 1 RPV nozzle to safe-end weld VRR-1RD-1A-N2H compares to the six criteria for TLAAs in 10 CFR 54.3, and justify whether or not the flaw evaluation should be identified as a TLAA for the LRA under the TLAA identification requirements of 10 CFR 54.21(c)(1). If the analysis needs to be identified as a TLAA, provide necessary information and LRA revision to support the TLAA disposition.

Exelon Response

A flaw was identified in the LGS, Unit 1 reactor pressure vessel (RPV) nozzle-to-safe end weld VRR-1RD-1A-N2H (N2H) in 1989 during an ultrasonic test (UT) examination, as discussed in LRA Section B.2.1.7, operating experience example 1. Three evaluations of the flaw in the N2H safe end were performed in accordance with IWB-3600 prior to Mechanical Stress Improvement Process (MSIP) application in 1992. These evaluations were compared to the six criteria for TLAAs in 10 CFR 54.3. These evaluations do not involve time-limited assumptions defined by the current operating term (Criterion 3 of 10 CFR 54.3(a)). Therefore, these evaluations should not be identified as TLAAs and do not require disposition in accordance with 10 CFR 54.21(c), as discussed below.
The first flaw evaluation was performed in 1989 following the UT examination that initially identified the flaw. The evaluation determined a crack growth rate and concluded that the flaw condition was acceptable for continued service for one additional operating cycle. Refer to letter and summary report from PECO to NRC, dated April 3, 1989 (Accession #8904120177), and letter and Safety Evaluation Report from NRC to PECO, dated May 2, 1989 (Accession #8905050163).

UT examination in October 1990 indicated a small increase in the length and depth of the flaw. A second flaw evaluation was performed that determined a crack growth rate and concluded that the flaw condition was acceptable for continued service for one additional operating cycle. Refer to letter and summary report from PECO to NRC, dated October 23, 1990 (Accession #9011020035), and letter and Safety Evaluation Report from NRC to PECO, dated November 20, 1990 (Accession #9011290241).

UT examination in April 1992 indicated no appreciable increase in flaw size since the October 1990 examination. A third flaw evaluation concluded that MSIP could be safely applied and would arrest crack growth. This evaluation did not involve a time-limited assumption. Periodic inspection in accordance with LGS Technical Specifications and NRC GL 88-01 and management of reactor coolant water chemistry were documented as the bases for continued operation. Refer to letter and summary report from PECO to NRC, dated April 3, 1992 (Accession #9204160038) and letter from NRC to PECO, dated April 9, 1992 (Accession #9204200237). MSIP was successfully applied to the N2H safe end in April 1992. Periodic inspections have been performed since 1992 in accordance with Technical Specifications and NRC GL 88-01 requirements, which have confirmed that crack growth in the N2H nozzle safe end has been arrested.

The flaw condition is being managed in accordance with the GL 88-01 inspection program and through effective management of reactor coolant water chemistry. This is consistent with the license renewal aging management review for Nozzle Safe Ends and Welds (N2 Recirculation Inlet) as shown in LRA Table 3.1.2-2.

Commitment 47 provided in response to License Renewal Action Item No. 14 for BWRVIP-74-A requires re-evaluation of the condition of the flaw in the N2H nozzle safe end and any crack growth that occurs prior to the period of extended operation to verify the acceptability of the condition upon entering the period of extended operation.

Enclosure B
LGS License Renewal Application Updates

Notes:

- Updated LRA Sections and Tables are provided in the same order as the RAI responses contained in Enclosure A.
- To facilitate understanding, portions of the original LRA have been repeated in this Enclosure, with revisions indicated.
- Existing LRA text is shown in normal font. Changes are highlighted with ***bold italics*** for inserted text and strikethroughs for deleted text.

As a result of the response to RAI 2.3.3.17-1 provided in Enclosure A of this letter, LRA Section 3.3.2.1.17, pages 3.3-20 and 3.3-21, is revised as follows:

3.3.2.1.17 Process Radiation Monitoring System

Materials

The materials of construction for the Process Radiation Monitoring System components are:

- Aluminum
- ~~Carbon Steel~~
- Carbon and Low Alloy Steel Bolting
- Copper Alloy with less than 15% Zinc
- Glass
- Stainless Steel
- Stainless Steel Bolting

Environments

The Process Radiation Monitoring System components are exposed to the following environments:

- Air - Indoor, Uncontrolled
- Air/Gas - Wetted
- ***Closed Cycle Cooling Water***
- Raw Water
- ~~Treated Water~~

Aging Effects Requiring Management

The following aging effects associated with the Process Radiation Monitoring System components require management:

- Loss of Material
- Loss of Preload

Aging Management Programs

The following aging management programs manage the aging effects for the Process Radiation Monitoring System components:

- Bolting Integrity (B.2.1.11)
- ***Closed Treated Water Systems (B.2.1.13)***
- ~~External Surfaces Monitoring of Mechanical Components (B.2.1.25)~~
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)

- ~~One-Time Inspection (B.2.1.22)~~
- Open-Cycle Cooling Water System (B.2.1.12)
- ~~Water Chemistry (B.2.1.2)~~

As a result of the response to RAI 2.3.3.17-1 provided in Enclosure A of this letter, LRA Table 3.3.2-17, pages 3.3-194 through 3.3-197, is revised as follows:

Table 3.3.2-17 Process Radiation Monitoring System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Item	Table 1 Item	Notes
Bolting	Mechanical Closure	Carbon and Low Alloy Steel Bolting	Air - Indoor, Uncontrolled (External)	Loss of Material	Bolting Integrity (B.2.1.11)	VII.I.AP-125	3.3.1-12	A
				Loss of Preload	Bolting Integrity (B.2.1.11)	VII.I.AP-124	3.3.1-15	A
		Stainless Steel Bolting	Air - Indoor, Uncontrolled (External)	Loss of Material	Bolting Integrity (B.2.1.11)	VII.I.AP-125	3.3.1-12	A
				Loss of Preload	Bolting Integrity (B.2.1.11)	VII.I.AP-124	3.3.1-15	A
Flow Device	Pressure Boundary	Glass	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-14	3.3.1-117	A
			Air/Gas - Wetted (Internal)	None	None	VII.J.AP-97	3.3.1-117	A
		Stainless Steel	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-17	3.3.1-120	A
			Air/Gas - Wetted (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)	VII.F2.AP-99	3.3.1-94	C
~~Heat Exchanger Components)~~	~~Leakage Boundary~~	~~Stainless Steel~~	~~Air - Indoor, Uncontrolled (External)~~	~~None~~	~~None~~	~~VII.J.AP-17~~	~~3.3.1-120~~	~~A~~
			~~Air/Gas - Wetted (Internal)~~	~~Loss of Material~~	~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)~~	~~VII.F2.AP-99~~	~~3.3.1-94~~	~~C~~
			~~Treated Water (Internal)~~	~~Loss of Material~~	~~One-Time Inspection (B.2.1.22)~~	~~VII.E3.AP-110~~	~~3.3.1-25~~	~~C~~
					~~Water Chemistry (B.2.1.2)~~	~~VII.E3.AP-110~~	~~3.3.1-25~~	~~C~~

Table 3.3.2-17 Process Radiation Monitoring System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Item	Table 1 Item	Notes
Hoses	Leakage Boundary	Stainless Steel	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-17	3.3.1-120	A
			~~Treated Water (Internal)~~ ***Closed Cycle Cooling Water (Internal)***	Loss of Material	~~One-Time Inspection (B.2.1.22)~~	~~VII.E3.AP-110~~	~~3.3.1-25~~	~~A~~
					~~Water Chemistry (B.2.1.2)~~ ***Closed Treated Water Systems (B.2.1.13)***	~~VII.E3.AP-110~~ ***VII.C2.A-52***	~~3.3.1-25~~ ***3.3.1-49***	A
	Pressure Boundary	Stainless Steel	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-17	3.3.1-120	A
			Raw Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.2.1.12)	VIII.F.SP-117	3.4.1-21	C
Piping, piping components, and piping elements	Leakage Boundary	~~Carbon Steel~~	~~Air - Indoor, Uncontrolled (External)~~	~~Loss of Material~~	~~External Surfaces Monitoring of Mechanical Components (B.2.1.25)~~	~~VII.D.A-80~~	~~3.3.1-78~~	~~A~~
			~~Raw Water (Internal)~~	~~Loss of Material~~	~~Open-Cycle Cooling Water System (B.2.1.12)~~	~~VII.C1.AP-183~~	~~3.3.1-38~~	~~C~~
			~~Treated Water (Internal)~~	~~Loss of Material~~	~~One-Time Inspection (B.2.1.22)~~	~~VII.E3.AP-106~~	~~3.3.1-21~~	~~A~~
					~~Water Chemistry (B.2.1.2)~~	~~VII.E3.AP-106~~	~~3.3.1-21~~	~~A~~
		Stainless Steel	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-17	3.3.1-120	A
			Raw Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.2.1.12)	VIII.E.SP-117	3.4.1-19	C
			~~Treated Water (Internal)~~ ***Closed Cycle Cooling Water (Internal)***	Loss of Material	~~One-Time Inspection (B.2.1.22)~~	~~VII.E3.AP-110~~	~~3.3.1-25~~	~~A~~
					~~Water Chemistry (B.2.1.2)~~ ***Closed Treated Water Systems (B.2.1.13)***	~~VII.E3.AP-110~~ ***VII.C2.A-52***	~~3.3.1-25~~ ***3.3.1-49***	A
			Air/Gas - Wetted (Internal)	***Loss of Material***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)***	***VII.F2.AP-99***	***3.3.1-94***	***C***
	Pressure Boundary	~~Carbon Steel~~	~~Air - Indoor, Uncontrolled (External)~~	~~Loss of Material~~	~~External Surfaces Monitoring of Mechanical Components (B.2.1.25)~~	~~VII.D.A-80~~	~~3.3.1-78~~	~~A~~
			~~Raw Water (Internal)~~	~~Loss of Material~~	~~Open-Cycle Cooling Water System (B.2.1.12)~~	~~VII.C1.AP-183~~	~~3.3.1-38~~	~~C~~
		Stainless Steel	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-17	3.3.1-120	A

Table 3.3.2-17 Process Radiation Monitoring System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Item	Table 1 Item	Notes
Piping, piping components, and piping elements	Pressure Boundary	Stainless Steel	Air/Gas - Wetted (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)	VII.F2.AP-99	3.3.1-94	C
			Raw Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.2.1.12)	VIII.F.SP-117	3.4.1-21	C
Pump Casing	Leakage Boundary	Copper Alloy with less than 15% Zinc	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-144	3.3.1-114	A
			~~Treated Water (Internal)~~ ***Closed Cycle Cooling Water (Internal)***	Loss of Material	~~One-Time Inspection (B.2.1.22)~~	~~VII.E3.AP-140~~	~~3.3.1-22~~	~~A~~
					~~Water Chemistry (B.2.1.2)~~ ***Closed Treated Water Systems (B.2.1.13)***	~~VII.E3.AP-140~~ ***VII.C2.AP-199***	~~3.3.1-22~~ ***3.3.1-46***	A
	Pressure Boundary	Aluminum	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-135	3.3.1-113	A
			Air/Gas - Wetted (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)	VII.F2.AP-142	3.3.1-92	A
		Copper Alloy with less than 15% Zinc	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-144	3.3.1-114	A
			Raw Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.2.1.12)	VII.C1.AP-196	3.3.1-36	A
Valve Body	Leakage Boundary	~~Carbon Steel~~	~~Air - Indoor, Uncontrolled (External)~~	~~Loss of Material~~	~~External Surfaces Monitoring of Mechanical Components (B.2.1.25)~~	~~VII.D.A-80~~	~~3.3.1-78~~	~~A~~
			~~Raw Water (Internal)~~	~~Loss of Material~~	~~Open-Cycle Cooling Water System (B.2.1.12)~~	~~VII.C1.AP-183~~	~~3.3.1-38~~	~~C~~
			~~Treated Water (Internal)~~	~~Loss of Material~~	~~One-Time Inspection (B.2.1.22)~~	~~VII.E3.AP-106~~	~~3.3.1-21~~	~~A~~
					~~Water Chemistry (B.2.1.2)~~	~~VII.E3.AP-106~~	~~3.3.1-21~~	~~A~~
		Stainless Steel	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-17	3.3.1-120	A

Table 3.3.2-17 Process Radiation Monitoring System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Stainless Steel	Raw Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.2.1.12)	VIII.F.SP-117	3.4.1-21	C
			~~Treated Water (Internal)~~ ***Closed Cycle Cooling Water (Internal)***	Loss of Material	~~One-Time Inspection (B.2.1.22)~~	~~VII.E3.AP-110~~	~~3.3.1-25~~	~~A~~
					~~Water Chemistry (B.2.1.2)~~ ***Closed Treated Water Systems (B.2.1.13)***	~~VII.E3.AP-110~~ ***VII.C2.A-52***	~~3.3.1-25~~ ***3.3.1-49***	A
			Air/Gas - Wetted (Internal)	***Loss of Material***	***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)***	***VII.F2.AP-99***	***3.3.1-94***	***C***
	Pressure Boundary	~~Carbon Steel~~	~~Air - Indoor, Uncontrolled (External)~~	~~Loss of Material~~	~~External Surfaces Monitoring of Mechanical Components (B.2.1.25)~~	~~VII.D.A-80~~	~~3.3.1-78~~	~~A~~
			~~Raw Water (Internal)~~	~~Loss of Material~~	~~Open-Cycle Cooling Water System (B.2.1.12)~~	~~VII.C1.AP-183~~	~~3.3.1-38~~	~~C~~
		Stainless Steel	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-17	3.3.1-120	A
			Air/Gas - Wetted (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)	VII.F2.AP-99	3.3.1-94	C
			Raw Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.2.1.12)	VIII.F.SP-117	3.4.1-21	C

As a result of the response to RAI 2.3.3.17-1 provided in Enclosure A of this letter, the affected *Item Numbers* of LRA Table 3.3.1 are revised as follows:

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
3.3.1-21	Steel Piping, piping components, and piping elements exposed to Treated water	Loss of material due to general, pitting, and crevice corrosion	Chapter XI.M2, "Water Chemistry," and Chapter XI.M32, "One-Time Inspection"	No	Consistent with NUREG-1801. The Water Chemistry (B.2.1.2) program and One-Time Inspection (B.2.1.22) program will be used to manage the loss of material in carbon steel piping, piping components, and piping elements, tanks, and heat exchanger components exposed to treated water in the Auxiliary Steam System, Control Rod Drive System, Fuel Pool Cooling and Cleanup System, ~~Process Radiation Monitoring System,~~ Process and Post-Accident Sampling System, Radwaste System, Reactor Water Cleanup System, Standby Liquid Control System, and Water Treatment and Distribution System.
3.3.1-22	Copper alloy Piping, piping components, and piping elements exposed to Treated water	Loss of material due to general, pitting, crevice, and galvanic corrosion	Chapter XI.M2, "Water Chemistry," and Chapter XI.M32, "One-Time Inspection"	No	Consistent with NUREG-1801. The Water Chemistry (B.2.1.2) program and One-Time Inspection (B.2.1.22) program will be used to manage the loss of material in copper alloy piping, piping components, and piping elements, and heat exchanger components exposed to treated water in the Auxiliary Steam System, Fuel Pool Cooling and Cleanup System, High Pressure Coolant Injection System, ~~Process Radiation Monitoring System,~~ Process and Post-Accident Sampling System, and Reactor Core Isolation Cooling System.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems					
Item Number	**Component**	**Aging Effect/ Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-25	Stainless steel, Stainless steel; steel with stainless steel cladding, Aluminum Piping, piping components, and piping elements, Heat exchanger components exposed to Treated water, Sodium pentaborate solution	Loss of material due to pitting and crevice corrosion	Chapter XI.M2, "Water Chemistry," and Chapter XI.M32, "One-Time Inspection"	No	Consistent with NUREG-1801. The Water Chemistry (B.2.1.2) program and One-Time Inspection (B.2.1.22) program will be used to manage the loss of material in stainless steel, cast austenitic stainless steel, carbon or low alloy steel with stainless steel cladding, and aluminum piping, piping components, and piping elements, heat exchanger components, and tanks exposed to treated water and sodium pentaborate solution in the Auxiliary Steam System, Control Rod Drive System, Fuel Handling and Storage, Fuel Pool Cooling and Cleanup System, ~~Process Radiation Monitoring System,~~ Process and Post-Accident Sampling System, Radwaste System, Reactor Coolant Pressure Boundary, Reactor Water Cleanup System, Standby Liquid Control System, and Water Treatment and Distribution System. The Bolting Integrity (B.2.1.11) program has been substituted and will be used to manage the loss of material in stainless steel bolting exposed to treated water in the Fuel Pool Cooling and Cleanup System. The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.14) program has been substituted for the One-Time Inspection (B.2.1.22) program and will be used with the Water Chemistry (B.2.1.2) program to manage the loss of material in aluminum crane/hoist components exposed to treated water in the Fuel Handling and Storage system.

Table 3.3.1 Summary of Aging Management Evaluations for the Auxiliary Systems					
Item Number	**Component**	**Aging Effect/ Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-38	Copper alloy, Steel Heat exchanger components exposed to Raw water	Loss of material due to general, pitting, crevice, galvanic, and microbiologically-influenced corrosion; fouling that leads to corrosion	Chapter XI.M20, "Open-Cycle Cooling Water System"	No	Consistent with NUREG-1801. The Open-Cycle Cooling Water System (B.2.1.12) program will be used to manage the loss of material in copper alloy, carbon steel, ductile cast iron, and gray cast iron piping, piping components, and piping elements, and heat exchanger components exposed to raw water in the Nonsafety-Related Service Water System, ~~Process Radiation Monitoring System,~~ and Safety Related Service Water System.
3.3.1-46	Steel, Copper alloy Heat exchanger components, Piping, piping components, and piping elements exposed to Closed-cycle cooling water	Loss of material due to general, pitting, crevice, and galvanic corrosion	Chapter XI.M21A, "Closed Treated Water Systems"	No	Consistent with NUREG-1801. The Closed Treated Water Systems (B.2.1.13) program will be used to manage the loss of material in carbon steel and copper alloy heat exchanger components, piping, piping components, and piping elements exposed to closed cycle cooling water in the Closed Cooling Water System, Control Enclosure Ventilation System, Emergency Diesel Generator System, ~~and~~ Primary Containment Ventilation System, ***and Process Radiation Monitoring System***.
3.3.1-49	Stainless steel Piping, piping components, and piping elements exposed to Closed-cycle cooling water	Loss of material due to pitting and crevice corrosion	Chapter XI.M21A, "Closed Treated Water Systems"	No	Consistent with NUREG-1801. The Closed Treated Water Systems (B.2.1.13) program will be used to manage the loss of material in stainless steel piping, piping components, and piping elements, and heat exchanger components exposed to closed cycle cooling water in the Closed Cooling Water System, Control Enclosure Ventilation System, Emergency Diesel Generator System, Primary Containment Ventilation System, ***Process Radiation Monitoring System,*** and Reactor Coolant Pressure Boundary.

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**
3.3.1-78	Steel Piping and components (External surfaces), Ducting and components (External surfaces), Ducting; closure bolting exposed to Air – indoor, uncontrolled (External), Air – indoor, uncontrolled (External), Air – outdoor (External), Condensation (External)	Loss of material due to general corrosion	Chapter XI.M36, "External Surfaces Monitoring of Mechanical Components"	No	Consistent with NUREG-1801. The External Surfaces Monitoring of Mechanical Components (B.2.1.25) program will be used to manage the loss of material in carbon steel or low allow steel, carbon or low allow steel with stainless steel cladding, ductile cast iron, and gray cast iron piping, piping components, and piping elements, bolting, ducting and components, heat exchanger components, and tanks exposed to air-indoor, uncontrolled in the Auxiliary Steam System, Closed Cooling Water System, Compressed Air System, Control Enclosure Ventilation System, Control Rod Drive System, Emergency Diesel Generator Enclosure Ventilation System, Emergency Diesel Generator System, Fire Protection System, Fuel Pool Cooling and Cleanup System, Nonsafety-Related Service Water System, Plant Drainage System, Primary Containment Instrument Gas System, Primary Containment Leak Testing System, Primary Containment Ventilation System, ~~Process Radiation Monitoring System,~~ Process and Post-Accident Sampling System, Radwaste System, Reactor Enclosure Ventilation System, Reactor Water Cleanup System, Safety Related Service Water System, Spray Pond Pump House Ventilation System, Standby Liquid Control System, Traversing Incore Probe System, and Water Treatment and Distribution System.

As a result of the response to RAI 2.3.3.17-1 provided in Enclosure A of this letter, LRA Table 2.3.3-17, page 2.3-131 is revised as follows:

Table 2.3.3-17 Process Radiation Monitoring System
Component Subject to Aging Management Review

Component Type	Intended Function
Bolting	Mechanical Closure
Flow Device	Pressure Boundary
~~Heat Exchanger Components~~	~~Leakage Boundary~~
Hoses	Leakage Boundary
	Pressure Boundary
Piping, piping components, and piping elements	Leakage Boundary
	Pressure Boundary
Pump Casing	Leakage Boundary
	Pressure Boundary
Valve Body	Leakage Boundary
	Pressure Boundary

As a result of the response to RAI 2.3.3.22-2 provided in Enclosure A of this letter, LRA Table 3.3.2-2, page 3.3-93 for the Closed Cooling Water System is revised as follows:

Table 3.3.2-2 Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Item	Table 1 Item	Notes
Valve Body	Leakage Boundary	Carbon Steel	Air - Indoor, Uncontrolled (External)	Loss of Material	External Surfaces Monitoring of Mechanical Components (B.2.1.25)	VII.I.A-77	3.3.1-78	A
			Closed Cycle Cooling Water (Internal)	Loss of Material	Closed Treated Water Systems (B.2.1.13)	VII.C2.AP-189	3.3.1-46	C
		Copper Alloy with 15% Zinc or More	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-144	3.3.1-114	A
			Closed Cycle Cooling Water (Internal)	Loss of Material	Closed Treated Water Systems (B.2.1.13)	VII.C2.AP-199	3.3.1-46	A
					Selective Leaching (B.2.1.23)	VII.C2.AP-43	3.3.1-72	A
		Copper Alloy with less than 15% Zinc	***Air - Indoor, Uncontrolled (External)***	***None***	***None***	***VII.J.AP-144***	***3.3.1-114***	***A***
			Closed Cycle Cooling Water (Internal)	***Loss of Material***	***Closed Treated Water Systems (B.2.1.13)***	***VII.C2.AP-199***	***3.3.1-46***	***A***

As a result of the response to RAI 2.3.3.22-2 provided in Enclosure A of this letter, LRA Section 3.3.2.1.2, page 3.3-4 for the Closed Cooling Water System is revised as follows:

3.3.2.1.2 Closed Cooling Water System

Materials

The materials of construction for the Closed Cooling Water System components are:

- Carbon Steel
- Carbon and Low Alloy Steel Bolting
- Copper
- Copper Alloy with 15% Zinc or More
- ***Copper Alloy with less than 15% Zinc***
- Glass
- Gray Cast Iron
- Stainless Steel

As a result of the response to RAI B.2.1.33-3 provided in Enclosure A of this letter, LRA Appendix B.2.1.33, page B-133, is revised as follows:

B.2.1.33 10 CFR PART 50, APPENDIX J

Program Description

The 10 CFR Part 50, Appendix J aging management program is an existing condition monitoring program that provides for detection of age related pressure boundary degradation due to aging effects including loss of material, loss of sealing, loss of leak tightness, and loss of bolting preload in the containment and various systems penetrating primary containment. The program manages steel containment structural elements, concrete embedments, penetration sleeves, hatches, airlocks, and bolting in air-indoor and treated water environments. The program also provides for detection of degradation of gaskets and seals for the primary containment pressure boundary access points.

The program consists of tests performed in accordance with the regulations and guidance provided in 10 CFR 50 Appendix J, “Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors,” Option B, Regulatory Guide 1.163, “Performance-Based Containment Leak-Testing Program,” NEI 94-01, “Industry Guideline for Implementing Performance-Based Options of 10 CFR Part 50, Appendix J,” and ANSI/ANS 56.8, “Containment System Leakage Testing Requirements.”

Containment leak rate tests are performed ***using plant procedures*** to assure that leakage through the containment and systems and components penetrating primary containment does not exceed allowable leakage limits specified in the Technical Specifications. An integrated leak rate test (ILRT) is performed during a period of reactor shutdown at the frequency specified in 10 CFR Part 50, Appendix J, Option B. Local leak rate tests (LLRT) are performed on isolation valves and containment access penetrations at frequencies that comply with the requirements of 10 CFR 50 Appendix J, Option B.