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January 27, 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 Request for additional information, dated January 5, 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 License Renewal Application (TAC Nos. ME6555, ME6556)", dated January 5, 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. In the Reference 2 letter, 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 1-27-2012

Respectfully,



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

Enclosures: A: Responses to Request for Additional Information
B: Updates to affected Limerick 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-DORL, Limerick Generating Station
NRC Senior Resident Inspector, Limerick Generating Station
R. R. Janati, Commonwealth of Pennsylvania

Enclosure A

**Responses to Request for Additional Information related to various sections of the
Limerick Generating Station, Units 1 and 2,
License Renewal Application (LRA)**

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RAI 2.1-1

Background

10 CFR 54.4, "Scope," states, in part,

- (a) Plant systems, structures and components within the scope of this part are;
 - (1) Safety-related systems, structures, and components which are those relied upon to remain functional during and following design-basis events (as defined in 10 CFR 50.49(b)(1)) to ensure the following functions:
 - (i) The integrity of the reactor coolant pressure boundary;
 - (ii) The capability to shut down the reactor and maintain it in a safe shutdown condition; or
 - (iii) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable.

Issue

During the scoping and screening methodology audit, performed on-site September 19-23, 2011, the staff reviewed the license renewal application and license renewal implementing documents and had discussions with the applicant to determine the applicant's approach for identifying safety-related structures, systems and components (SSCs) included within the scope of license renewal in accordance with 10 CFR 54.4(a)(1). The staff determined that the applicant had used the "Q" field in the component database (CRL) to identify safety-related SSCs within the scope of license renewal in accordance with 10 CFR 54.4(a)(1). However, the applicant's procedure (CC-MA-304) used to populate the "Q" field in the CRL, refers to 10 CFR Part 100 as opposed 10 CFR 50.67 (Limerick Generating Station (LGS) is an alternate source term plant such that 10 CFR 50.67 is applicable).

Request

Provide a description of the process used to evaluate components or systems to be included within the scope of license renewal in accordance with 10 CFR 54.4(a)(1)(iii). Perform a review of this issue and indicate if the review concludes that use of the scoping methodology precluded the identification of SSCs which should have been included within the scope of license renewal in accordance with 10 CFR 54.4(a). Describe any additional scoping evaluations performed to address the 10 CFR 54.4(a)(1)(iii) criteria. List any additional SSCs included within the scope as a result of your efforts, and list those structures and components for which aging management reviews were conducted or any additional information related to material and environment combinations. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effects.

Exelon Response

The process used to evaluate components or systems to be included within the scope of license renewal is described in LRA Section 2.1. LGS plant components that have been classified as safety-related are identified as "Q-listed" in the controlled quality classification data field in the CRL. LGS procedure CC-MA-304 provides the requirements used to determine the component quality classification in the CRL, which includes the capability to prevent or mitigate the consequences of an accident that could result in potential offsite exposures comparable to

regulatory guideline exposures. LGS has Alternate Source Term (AST) methodology included in the licensing basis which invokes the regulatory exposure guidelines of 10 CFR 50.67.

Use of the AST methodology was approved by the NRC on September 8, 2006. The change to AST did not involve any physical changes to the plant or require any changes to the quality classification of plant components. The design changes only involved changes to analytical methodology used for the analysis of design basis accidents and associated dose consequences to off-site receptors and control room personnel. Changes to the LGS CRL after September 8, 2006, were reviewed and no components were identified that require additional evaluation for license renewal. No additional scoping evaluations are required to be performed to address the 10 CFR 54.4(a)(1)(iii) criteria.

Although the use of AST methodology added a new safety-related function for the standby liquid control system, no component quality classification changes were necessary because this system was already designed as a safety-related system for reactivity control. This new function, to buffer suppression pool water pH following a LOCA, is described in LRA Section 2.3.3.24. The use of AST methodology for LGS also did not result in the use of any nonsafety-related components or systems to perform safety-related functions and therefore, no changes to the quality classification of components were made.

The dose guidelines for design basis accidents were changed from 10 CFR 100 to 10 CFR 50.67 as described in the LGS UFSAR, Chapter 15 as well as the description of requirements for safety-related components in the LGS UFSAR, Section 3.2.3. The applicable LGS procedures were also revised to reflect this change with the exception of procedure CC-MA-304. An issue report has been created in the Corrective Action Program to provide the proper reference to 10 CFR 50.67 in procedure CC-MA-304. This change in dose guidelines did not affect any component quality classifications and did not preclude the identification of SSCs which should have been included within the scope of license renewal in accordance with 10 CFR 54.4(a).

RAI 2.1-2

Background:

10 CFR 54.4, "Scope," states, in part,

- (a) Plant systems, structures and components within the scope of this part are;
- (1) Safety-related systems, structures, and components which are those relied upon to remain functional during and following design-basis events (as defined in 10 CFR 50.49 (b)(1)) to ensure the following functions:
 - (i) The integrity of the reactor coolant pressure boundary;
 - (ii) The capability to shut down the reactor and maintain it in a safe shutdown condition; or
 - (iii) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable.
 - (2) All nonsafety-related systems, structures and components whose failure could prevent satisfactory accomplishment of any of the functions identified in (a)(1)(i), (ii), or (iii) of this section.

- (3) All systems, structures, and components relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49), pressurized thermal shock (10 CFR 50.61), anticipated transients without scram (10 CFR 50.62), and station blackout (10 CFR 50.63).

Issue

During the scoping and screening methodology audit, the staff reviewed the license renewal application, license renewal implementing documents and applicable sections of the LGS UFSAR. The staff determined that several plant systems discussed in the LGS UFSAR are not identified in the LRA. Discussions with the applicant indicated that systems nomenclature had been organized to correspond with the system information contained in NUREG-1801, "Generic Aging Lessons Learned (GALL) Report."

Request

Provide a description of the process used to identify systems to be included within the scope of license renewal in accordance with 10 CFR 54.4(a) and provide a discussion on the process used to identify systems listed in the UFSAR with system names discussed in the GALL Report. Perform a review of this issue and indicate if the review concludes that use of the scoping methodology precluded the identification of systems, structures, and components (SSCs) which should have been included within the scope of license renewal in accordance with 10 CFR 54.4(a). Describe any additional scoping evaluations performed to address the 10 CFR 54.4(a) criteria. List any additional SSCs included within the scope as a result of your efforts, and list those structures and components for which aging management reviews were conducted or any additional information related to material and environment combinations. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effects.

Exelon Response

The process for identifying systems to be included within the scope of license renewal in accordance with 10 CFR 54.4(a) began with the review of systems contained in the plant component record database. This review was supplemented with a review of the UFSAR and other plant documentation such as plant procedures, plant drawings, and Maintenance Rule documentation, to ensure a comprehensive identification of all plant systems and structures.

This comprehensive list of plant systems and structures was then evaluated and arranged into logical groupings for license renewal evaluation, and the groupings were defined as license renewal systems and structures. The distinction between plant systems and license renewal systems falls into several categories. In some cases, GALL system names were used to identify and group together Limerick plant systems or structures for license renewal. For example, a license renewal system called "Reactor Coolant Pressure Boundary" was created to align with the GALL system of the same name. This license renewal system is comprised of existing plant systems, primarily the reactor recirculation system and Class 1 portions of systems connected to the reactor vessel and recirculation loops, which perform the reactor coolant pressure boundary function and could logically be grouped together for license renewal evaluation. In other cases, plant system and structure descriptive titles were modified to

encompass various descriptive nomenclature used across multiple plant documents. For example, the license renewal structure called Chemistry Lab is the same structure that is described in the UFSAR and on plant drawings as both the Chemistry Lab Expansion and the Chemistry Lab. Finally, plant systems and structures described in the UFSAR that perform the same function were grouped together to facilitate a streamlined license renewal evaluation where appropriate. For example, the Miscellaneous I&C license renewal system is comprised of the vibration monitoring, data acquisition, meteorological towers, seismic monitoring, plant monitoring, system automatic monitoring and control, and emergency response facility display plant systems, which are all identified in the UFSAR as individual systems.

LRA Table 2.2-1 lists the systems and structures to be evaluated for license renewal based on the process described above.

A review of this issue was performed and it was concluded that the scoping methodology correctly identified the systems, structures, and components (SSCs) which should be included within the scope of license renewal in accordance with 10 CFR 54.4(a). There are no additional scoping evaluations required or additional SSCs to be included. No additions or changes to LRA Table 2.2-1 have been identified as a result of this review.

During evaluation of this RAI, an error was identified in the UFSAR in which a system that no longer exists, the Process Computer System, was deleted from the text of the UFSAR but not the Table of Contents. A Corrective Action Program Issue Report has been initiated to correct this discrepancy.

RAI 2.1-3

Background

10 CFR 54.4, "Scope," states, in part:

- (a) Plant systems, structures and components within the scope of this part are
 - (1) Safety-related systems, structures, and components which are those relied upon to remain functional during and following design-basis events (as defined in 10 CFR 50.49(b)(1)) to ensure the following functions:
 - (i) The integrity of the reactor coolant pressure boundary;
 - (ii) The capability to shut down the reactor and maintain it in a safe shutdown condition;
or
 - (iii) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable.
 - (2) All nonsafety-related systems, structures and components whose failure could prevent satisfactory accomplishment of any of the functions identified in (a)(1)(i), (ii), or (iii) of this section.

Issue

During the scoping and screening methodology audit, performed on-site September 19-23, 2011, the staff reviewed the license renewal application, license renewal implementing documents and applicable sections of the UFSAR. The staff determined that although the LRA shows the auxiliary boiler building is in scope for an (a)(2) intended function due to its proximity to the reactor enclosure and its location above the auxiliary boiler pipe tunnel (which contains SR pipe), the adjacent lube oil building, also located above the auxiliary boiler pipe tunnel, is not included within the scope of license renewal.

Request

The staff requests that the applicant perform a review of this issue and provided a discussion and basis for not including the nonsafety-related lube oil building, located above the auxiliary boiler pipe tunnel, within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). Indicate if the review concludes that use of the scoping methodology precluded the identification of systems, structures, and components (SSCs) which should have included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). Describe any additional scoping evaluations performed to address the 10 CFR 54.4(a)(2) criteria. List any additional SSCs included within the scope as a result of your efforts, and list those structures and components for which aging management reviews were conducted or any additional information related to material and environment combinations. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effects.

Exelon Response

The Auxiliary Boiler Enclosure, Auxiliary Boiler Pipe Tunnel, Fuel Oil Pump House Enclosure, and Lube Oil Enclosure are nonsafety-related and non-Category I structures as described within the Limerick UFSAR. The Auxiliary Boiler Enclosure and the Auxiliary Boiler Pipe Tunnel are both adjacent to the safety-related seismic Category 1 Reactor Enclosure which is in scope under 10 CFR 54.4(a)(1). The Auxiliary Boiler Enclosure and the Auxiliary Boiler Pipe Tunnel are in scope under 10 CFR 54.4(a)(2) since a failure of either the Auxiliary Boiler Enclosure or the Auxiliary Boiler Pipe Tunnel could potentially impair the integrity of the adjacent in-scope Reactor Enclosure. The nonsafety-related Lube Oil Storage Enclosure is not located immediately adjacent to an 10 CFR 54.4 (a)(1) structure and its failure would not prevent the accomplishment of any 10 CFR 54.4(a)(1) system, structure, or component intended function. The Lube Oil Storage Enclosure is therefore not in scope for license renewal.

The determination that the Lube Oil Storage Enclosure is not in scope for license renewal is consistent with the methodology described in LRA Section 2.1.3.3. A review of this issue was performed and it was concluded that the use of this scoping methodology did not preclude the identification of systems, structures, and components (SCCs) which should be included within scope of license renewal in accordance with 10 CFR 54.4(a)(2). There are no additional scoping evaluations required, no additional SSCs to be included and no additional aging management programs to be credited.

To clarify the scoping determination for the Auxiliary Boiler and Lube Oil Storage Enclosure, Section 2.4.3 of the LRA is revised as shown in Enclosure B.

RAI 2.1-4

Background

LRA Section 2.1.5.2 states nonsafety-related SSCs attached to safety-related SSCs are in the scope of license renewal for 10 CFR 54.4(a)(2) up to the first seismic (or equivalent) anchor past the safety-related/non-safety related interface.

LRA Section 2.0, "Scoping and Screening Methodology for Identifying Structures and Components Subject to Aging Management Review, and Implementation Results," states that the scoping and screening methodology is consistent with the guidelines presented in NEI 95-10, "Industry Guidelines for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," Revision 6.

NEI 95-10 defines equivalent anchor as a combination of restraints or supports such that the nonsafety-related piping and associated structures and components attached to safety related piping is included in scope up to a boundary point that encompasses at least six supports (two in each of three orthogonal directions).

Issue

During the scoping and screening methodology audit, the staff reviewed the license renewal application, license renewal implementing documents, license renewal drawings and applicable sections of the UFSAR. During the review of the applicants drawing and discussions with the applicant, the staff determined that when the applicant could not identify the required supports to develop an equivalent anchor (six in total) prior to a branch connection in the nonsafety-related pipe attached to safety-related SCs, the applicant did not consistently identify the remaining required supports on all branch connections. Specifically, the applicant stated that in some cases the branch lines and supports are included within the scope of license renewal and other cases are not included within the scope of license renewal.

Request

Perform a review of this issue and provide a discussion and the basis for the position of not including nonsafety-related pipe, attached to safety-related SCs, up to and including the first anchor or bounding condition, within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). Indicate if the review concludes that use of the scoping methodology precluded the identification of systems, structures, and components (SSCs) which should have been included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). Describe any additional scoping evaluations performed to address the 10 CFR 54.4(a)(2) criteria. List any additional SSCs included within the scope as a result of your efforts, and list those structures and components for which aging management reviews were conducted or any additional information related to material and environment combinations. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effects.

Exelon Response

During the audit, it was identified that in scope nonsafety-related Unit 1 Primary Containment Instrument Gas (PCIG) system piping connected to safety-related piping did not include the

required supports to develop an equivalent seismic anchor prior to a branch connection off the nonsafety-related pipe. Therefore, the license renewal 10 CFR 54.4(a)(2) boundary for the structural support intended function at the branch connection was not extended to all of the piping supports required to develop the equivalent anchor. Further review of this piping configuration identified that the license renewal 10 CFR 54.4(a)(2) boundary needed to be extended to include several feet of additional piping and associated piping supports. This change does not result in additional function/ component/ material combinations within the aging management review for the PCIG system as shown in LRA Table 3.3.2-14.

The methodology used for the determination of safety-related/nonsafety-related interfaces is described in LRA Section 2.1.5.2. For nonsafety-related piping directly connected to safety-related piping, the nonsafety-related piping was assumed to provide structural support to the safety-related piping, and is included within the scope of license renewal for 10 CFR 54.4(a)(2). An extent of condition review performed for all systems within the scope of license renewal identified six additional instances within the scoping performed for the LRA, where the 10 CFR 54.4(a)(2) boundary at a branch connection was not extended to all of the piping supports required to develop an equivalent seismic anchor or bounding criteria described in NEI 95-10, Appendix F. All of the locations are within the PCIG system. Extension of the 10 CFR 54.4(a)(2) boundary at these branch connections results in adding nine valve bodies and several sections of piping and piping components within the scope of license renewal. The review also identified the need to add two function/ component/ material combinations to the aging management review for the PCIG system.

The extended scoping boundaries and their impact on License Renewal Boundary Drawings submitted with the LRA are discussed below:

- On LR-M-59, Sheet 1 at coordinate G-4, the (a)(2) piping boundary on PCIG Header B is extended upstream of valve 1130H to include the branch connections to PSV-41-1F013M&S that are shown as a typical configuration, and a section of piping upstream of the tee to valve 1130H.
- On LR-M-59, Sheet 1 at coordinate G-4, the (a)(2) piping boundary on Header A is extended upstream of valve 1130E to include the branch connection to PSV-41-1F013K that is shown as a typical configuration, and a section of piping upstream of the tee to valve 1130E. The (a)(2) piping boundary is also revised to include branch piping from Header A through valve 1023A, and branch piping from Header B through valve 1024A, through valve 1018A to PSV-41-1F013A. The boundary continues to LR-M-41 Sheet 2 at coordinate F-7 to include valves 1F036A and 1034A, ending upstream of accumulator 1AT003. The boundary is also revised to include a portion of Header A branch piping through valve 1042B, a portion of Header B piping to valve 1041B ending upstream of valve 1074B, shown as a typical configuration at coordinate D-4. The boundary is also revised to include a portion of Header A branch piping through valve 1075B ending immediately downstream of valve 1075B, shown as a typical configuration at coordinate D-4.
- On LR-M-59, Sheet 1 at coordinate G-5, the (a)(2) piping boundary is extended downstream of valve 1005B to include additional branch piping downstream of valve 1004B on Header B. The boundary as represented on LR-M-59 Sheet 1 is correct as shown.
- On LR-M-59, Sheet 3 at coordinate G-4, the (a)(2) piping boundary on PCIG Header A is extended upstream of valve 2130E to include the branch connection to PSV-41-2F013K that is shown as a typical configuration.

- LR-M-59, Sheet 3 at coordinate G-4, the (a)(2) piping boundary on PCIG Header B is extended upstream of valve 2130H to include the branch connections to PSV-41-2F013M&S that are shown as a typical configuration.
- On LR-M-59, Sheet 3 at coordinate F-4, the (a)(2) piping boundary is extended downstream of valve 2005B to include additional branch piping downstream of valve 2004B on Header B. The boundary as represented on LR-M-59 Sheet 3 is correct as shown.
- On LR-M-76, Sheet 3 at coordinate D-7, the (a)(2) piping boundary is extended upstream of the red (a)(2) 1"JBD-336 piping back to LR-M-59 Sheet 2 at coordinate D-6. On LR-M-59, Sheet 2 at coordinate D-6, the (a)(2) piping boundary is extended back to include a section of branch piping downstream of PSV-121B, a section of piping downstream of PSV-160B, a section of piping downstream of PSV-160A-2 ending downstream of the branch piping to valve 1152A, a section of branch piping downstream of PSV-121A, and a section of branch piping ending upstream of the branch connection to valve 1209. The (a)(2) piping boundary also extends to include valve 1209, ending between valves 1209 and 1208.

This review also identified several cases where a branch connection that has a much smaller moment of inertia than the line it is connected to is not required to be included within the 10 CFR 54.4(a)(2) boundary for structural support. This is consistent with bounding criteria described in NEI 95-10, Appendix F. The Limerick design bases defines that if the ratio of the larger piping to smaller piping outside diameter is greater than or equal to 3 to 1, the branch piping is considered decoupled from the large piping stress analysis and the tee to the larger piping is considered an anchor for the smaller branch piping. LRA Section 2.1.5.2 is revised as shown in Enclosure B to add a bounding criteria that precludes decoupled branch lines from the 10 CFR 54.4(a)(2) boundary for structural support.

This review concluded that use of the scoping methodology did not preclude the identification of systems, structures, and components (SSCs) which should have been included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). The need to add the components discussed above within the scope of license renewal is a result of not applying the scoping methodology discussed in LRA Section 2.1.5.2 consistently for some piping configurations that include branch connections. No additional scoping evaluations are required to address the 10 CFR 54.4(a)(2) criteria. This review resulted in several sections of stainless steel piping and eight stainless steel valve bodies being added to the scope of license renewal. Aging management review for these components is per existing line items for stainless steel valve bodies, piping, piping components and piping elements with structural support function having air-indoor (external) and air/gas wetted (internal) environments as shown in LRA Table 3.3.2-14.

This review also resulted in several sections of carbon steel piping, piping components and piping elements and one carbon steel valve body with structural support intended function being added to the scope of license renewal. These components have air-indoor (external) and air/gas wetted (internal) environments and are being added to the aging management review for the PCIG system. They are not within the portion of the PCIG system that requires aging management by the Compressed Air Monitoring aging management program. Consistent with other carbon steel components within the PCIG system that have leakage boundary intended function, the External Surfaces Monitoring of Mechanical Surfaces program manages the external material and environment combination, and the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program manages the internal material and environment combinations. LRA Table 3.3.2-14 is revised to add Carbon Steel Piping, Piping

Components, Piping Elements and Valve Bodies with Structural Support intended function as shown in Enclosure B.

RAI 2.1-5

Background

LRA Section 2.1.3.3, "10 CFR 54.4(a)(2) Scoping Criteria," states the following:

The basis document describes the LGS approach to scoping of nonsafety-related systems with a potential for physical or spatial interaction with safety-related SSCs. LGS chose to implement the preventive option as described in NEI 95-10. The basis document provides appropriate guidance to assure that license renewal scoping for 10 CFR 54.4(a)(2) met the requirements of the license renewal rule and NEI 95-10.

LRA Section 2.1.5.2 states non-safety related SSCs attached to safety-related SSCs are in the scope of license renewal for 10 CFR 54.4(a)(2) up to the first seismic (or equivalent) anchor past the safety-related/non-safety related interface.

NEI 95-10, Appendix F states the following:

For non-safety SSCs directly connected to safety-related SSCs (typically piping systems), the non-safety piping and supports, up to and including the first equivalent anchor beyond the safety/non-safety interface, are within the scope of license renewal per 54.4(a)(2).

Issue

During the scoping and screening methodology audit staff reviewed the applicant's implementing procedure that describes the process used to identify nonsafety-related SSCs, whose failure could potentially impact the performance of the intended function of safety-related SSCs, for inclusion within the scope of license renewal. The staff determined that the applicant's implementing procedure, when discussing nonsafety-related pipe directly attached to safety-related SCs, does not require that a portion of the nonsafety-related pipe (and applicable anchors or bounding conditions on the nonsafety-related side of the interface) be included within the scope of license renewal. Instead, the implementing procedure allows for an anchor directly at the nonsafety-related/safety-related interface, or close to the interface (on the safety-related side of the interface) to be used as the last anchor within the scope of license renewal.

Request

The staff requests that the applicant perform a review of this issue and provide a discussion and basis for the use of an implementing procedure that does not require including nonsafety-related pipe, attached to safety-related SCs, up to and including the first anchor or bounding condition, beyond the nonsafety-related/safety-related interface, within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). Indicate if the review concludes that use of the scoping methodology precluded the identification of systems, structures, and components (SSCs) which should have included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). Describe any additional scoping evaluations performed to address the 10 CFR 54.4(a)(2)

criteria. List any additional SSCs included within the scope as a result of your efforts, and list those structures and components for which aging management reviews were conducted or any additional information related to material and environment combinations. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effect.

Exelon Response

The methodology used for the determination of safety-related to nonsafety-related interfaces is described in LRA Section 2.1.5.2. For nonsafety-related piping directly connected to safety-related piping, the nonsafety-related piping was assumed to provide structural support to the safety-related piping, and is included within the scope of license renewal for 10 CFR 54.4(a)(2) up to and including the first anchor or bounding condition past the safety-related to nonsafety-related interface. The procedure for scoping and the scoping basis document for the determination of 10 CFR 54.4(a)(2) SSCs are consistent with this methodology. The procedure for the development of license renewal boundary drawings is not consistent with this methodology. This procedure provides several examples of drawing notes where the credited anchor is located on the safety-related piping and the nonsafety-related attached piping beyond the safety-related to nonsafety-related interface is not included in scope for structural support.

An extent of condition review, performed for all systems within the scope of license renewal, determined that there are no instances within the scoping performed for the preparation of the LRA, where an anchor or bounding condition on safety-related piping was credited for determining the license renewal boundary for piping that has a safety-related to nonsafety-related interface. Therefore, the review concluded that use of the scoping methodology as described in the procedure for the development of license renewal boundary drawings did not preclude the identification of systems, structures, and components (SSCs) which should have been included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). No additional scoping evaluations are required to address the 10 CFR 54.4(a)(2) criteria and there are no additional SSCs to be included within the license renewal scope as a result of this review.

A Corrective Action Program Issue Report has been initiated to revise the procedure for the development of license renewal boundary drawings to align this procedure with the methodology used for the determination of safety-related to nonsafety-related interfaces as described in LRA Section 2.1.5.2 and captured in the procedure for scoping and in the scoping basis document for the determination of 10 CFR 54.4(a)(2) SSCs.

RAI 2.1-6

Background

LRA Section 2.1.5.2 states that nonsafety-related SSCs attached to safety-related SCs are in the scope of license renewal for 10 CFR 54.4(a)(2) up to the first seismic (or equivalent) anchor or bounding condition past the safety-related/nonsafety-related interface. LRA Section 2.1.5.2 also states: (1) for fluid-filled nonsafety-related with the potential for spatial interaction it is assumed that nonsafety-related SSCs within these structures may be located in proximity to safety-related SSCs and included within the scope of license renewal and (2) there may be selected rooms within the structure that do not contain any safety-related components within the room.

Issue

During the scoping and screening methodology audit, the applicant stated that if the first anchor or bounding condition was determined to be beyond the area of potential spatial interaction for spray or leakage within the structure or room (space), the portion of nonsafety-related pipe, attached to a safety-related SC, included within the scope of license renewal was continued outside the space, up to and including an identified anchor or bounding condition. However, the applicant stated that if the anchor or bounding condition was within the space, the applicant included the pipe up to the boundary of the space, but did not specifically identify the anchor or bounding condition. The staff was not able to determine the process used by the applicant to confirm that an anchor or bounding condition existed within a space, if an anchor or bounding condition was not specifically identified.

Request

Perform a review of this issue and provide a discussion on the process used to verify that an anchor or bounding condition exists within the area of potential spatial interaction or nonsafety-related pipe attached to safety-related SCs, and therefore no additional pipe, anchors or bounding conditions needed to be included within the scope of license renewal outside the area of potential spatial interaction. Indicate if the review concludes that use of the scoping methodology precluded the identification of systems, structures, and components (SSCs) which should have included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). Describe any additional scoping evaluations performed to address the 10 CFR 54.4(a)(2) criteria. List any additional SSCs included within the scope as a result of your efforts, and list those structures and components for which aging management reviews were conducted or any additional information related to material and environment combinations. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effects.

Exelon Response

The methodology for evaluating nonsafety-related SSCs affecting safety-related SSCs is described in LRA Section 2.1.5.2. For nonsafety-related piping directly connected to safety-related piping, the nonsafety-related piping was assumed to provide structural support to the safety-related piping. The nonsafety-related piping was included in scope for 10 CFR 54.4(a)(2) up to an anchor or bounding condition. Failure in the nonsafety-related piping beyond this boundary would not impact structural support for the safety-related piping. If the connected nonsafety-related piping system contains fluid, then the in scope boundary was extended

beyond the anchor or bounding condition due to the potential for spatial interaction out to a point where there is no longer a spatial relationship.

LRA Table 2.1-1 defines the Leakage Boundary intended function. Nonsafety-related components required to maintain mechanical and structural integrity to prevent spatial interactions that could cause failure of safety-related SSCs have a Leakage Boundary intended function. This function includes the required structural support when the nonsafety-related piping is also attached to safety-related piping.

The Leakage Boundary intended function is shown on the license renewal drawings in red. When the SSCs in scope for structural support are enveloped by the SSCs in scope for spatial interaction, the location of the structural support endpoint has not been identified on the license renewal boundary drawing. When the location of the structural endpoint extends past the spatial envelope, the intended function of Structural Support is applied and a note is added to the license renewal boundary drawing.

An extent of condition review was performed on all license renewal boundary drawings associated with all systems within the scope of license renewal to identify the seismic anchors or bounding conditions within the areas of potential spatial interaction. This review confirmed that the scoping methodology was correctly implemented and that the seismic anchors or bounding conditions were within the areas of potential spatial interaction as shown on the license renewal boundary drawings except as described below. As a result of this review, the following (a)(2) structural support boundaries needed to be extended beyond the spatial envelope to include a seismic anchor or boundary condition:

- Condensate System - The (a)(2) scoping boundary for the 10" HBC-108 stainless steel piping was incorrectly identified at the Unit 1 Reactor Enclosure wall on license renewal boundary drawing LR-M-08 Sheet 2, at coordinate B-2 and on LR-M-55 Sheet 1, at coordinate G-4. The scoping boundary should have extended through the wall beyond the spatial envelope to just inside the Radwaste Enclosure to the credited anchor. This additional piping is in scope with a structural support intended function only since leakage is not a concern within the Radwaste Enclosure because the Radwaste Enclosure does not house safety-related SSCs.

LRA Section 2.3.4.2, Table 2.3.4-2 and Table 3.4.2-2 for the Condensate System are revised to include the piping added to license renewal scope, aging management review, and aging management programs credited for managing aging effects, as shown in Enclosure B.

- Safety Related Service Water System - The (a)(2) scoping boundary for 3" HBD carbon steel piping associated with the Unit 1 RHR heat exchanger tube corrosion monitoring subsystem was incorrectly identified on license renewal boundary drawing LR-M-12 Sheet 2 at coordinates D-1 and D-5. The scoping boundary should have extended up to and included the base mounted specimen chamber and specimen chamber service water pump. The piping, specimen chamber, and specimen chamber service water pump are added to license renewal scope only for Structural Support intended function since this equipment is abandoned, has been confirmed to be drained, and does not create a spatial interaction concern.

LRA Section 2.3.3.22, Section 3.3.2.1.22, Table 2.3.3-22, Table 3.3.1, and Table 3.3.2-22 for the Safety Related Service Water System are revised to include the SSCs added to

license renewal scope, aging management review, and aging management programs credited for managing aging effects, as shown in Enclosure B.

RAI 2.1-7

Background

10 CFR 54.4, "Scope," states, in part, that plant systems, structures and components within the scope of this part [includes] all nonsafety-related systems, structures and components whose failure could prevent satisfactory accomplishment of any of the functions identified in (a)(1)(i), (ii), or (iii) of this section (10 CFR 54.4).

Issue

During the scoping and screening methodology audit, performed on-site September 19-23, 2011, the staff noted that the applicant identified containment boundaries in the scope of license renewal, including the ceiling of the suppression pool. The staff also noted that there is abandoned nonsafety-related structural and miscellaneous steel (including the Q-deck) attached to the safety-related diaphragm slab. The applicant had determined not to include the abandoned nonsafety-related structural and miscellaneous steel within the scope of license renewal.

Request

The staff requests that the applicant perform a review of this issue and provide a discussion and basis for the position of not including abandoned nonsafety-related structural and miscellaneous steel, attached to the safety-related structures, within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). Indicate if the review concludes that use of the scoping methodology precluded the identification of systems, structures, and components (SSCs) which should have included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). Describe any additional scoping evaluations performed to address the 10 CFR 54.4(a)(2) criteria. List any additional SSCs included within the scope as a result of your efforts, and list those structures and components for which aging management reviews were conducted or any additional information related to material and environment combinations. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effects.

Exelon Response

Miscellaneous steel is included in LRA Table 2.4-11 as a component type within the scope of license renewal and subject to aging management review. LGS LRA Section 2.4.11, Primary Containment, Page 2.4-46 states: "The Containment Structure performs intended functions delineated in 10 CFR 54.4 and is inscope for license renewal in its entirety, except for the metal decking and abandoned steel under the diaphragm slab which does not perform an intended function." The design documents show that the subject metal decking serves no structural purpose and was designed as a form to support placement of concrete during construction. The metal decking is supported by structural steel which is within the scope of license renewal in accordance with 10 CFR 54.4 (a)(1) and 10 CFR 54.4(a)(2). The abandoned steel shown on a drawing for the diaphragm slab is limited to an abandoned monorail which is supported by other structural steel and bolting which are within the scope of license renewal in accordance with 10 CFR 54.4 (a)(1) and 10 CFR 54.4(a)(2). The metal decking and abandoned monorail steel

under the diaphragm slab do not perform any intended function and they are supported by structural steel and bolting which is within the scope of license renewal in accordance with 10 CFR 54.4 (a)(1) and 10 CFR 54.4(a)(2). The decision to not include the metal decking and abandoned monorail steel under the diaphragm slab within the scope of license renewal is consistent with the methodology discussed in Section 2.1.3.3 of the LRA. This is also consistent with the industry guidelines as described within NEI 95-10 Appendix F and as applied to other items such as nonsafety-related air and gas system piping and components, where the piping is not in scope but whose supports are in scope. A review of this issue was performed and it was concluded that the scoping methodology correctly identified the systems, structures, and components (SSCs) which should be included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2).

However, the metal decking on the underside of the Primary Containment diaphragm slab has been visually examined during the Containment ISI IWL examinations of the underside of the concrete diaphragm slab. The decking is now included within the scope of license renewal, as component type "Metal Decking" and subject to aging management using the Structures Monitoring aging management program during the inspections of the adjacent support steel. In addition, since the abandoned monorail steel is the only abandoned steel beneath the diaphragm slab and represents a small fraction of the steel under the diaphragm slab, the remainder of which is in scope, the abandoned monorail steel is now included in scope for completeness, as component type "Metal Components: All structural members (includes abandoned monorail steel)" and is subject to the Structures Monitoring aging management program.

Consistent with this response, LRA Section 2.4.11 (Page 2.4-45 and 2.4-46), Table 2.4-11 (Page 2.4-49), and Table 3.5.2-11 (Page 3.5-172) are revised as shown in Enclosure B.

Enclosure B

**Limerick Generating Station Units 1 and 2
License Renewal Application Updates**

Note: 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 2.1-3 provided in Enclosure A of this letter, LRA Section 2.4.3 is revised as follows:

2.4.3 Auxiliary Boiler and Lube Oil Storage Enclosure

Description:

The Auxiliary Boiler and Lube Oil Storage Enclosure include the Fuel Oil Pump House enclosure and the Auxiliary Boiler Pipe Tunnel (also known as the Machine Shop Pipe Tunnel).

Auxiliary Boiler Enclosure:

The Auxiliary Boiler enclosure is a seismic Category II structural steel, concrete block and precast concrete panel enclosure, which uses the eastern portion of the external Reactor Enclosure exterior wall as part of the enclosure. The building is approximately 21 feet by 72 feet in plan area and is a multi-story structure housing the auxiliary boiler and associated control and supporting equipment. The enclosure is located above a below-grade pipe tunnel, which contains steam piping and miscellaneous safety-related and nonsafety-related piping. The pipe tunnel foundation consists of a below grade reinforced concrete slab supported by fill. The roof is composed of a metal deck with a membrane cover located over insulation. The Auxiliary Boiler enclosure is a nonsafety-related structure designed to commercial grade standards. There is a seismic gap provided between the Auxiliary Boiler enclosure and the Reactor enclosure. The Auxiliary Boiler enclosure has been, analytically evaluated to ensure that the nonsafety-related structure does not collapse on or otherwise impair the integrity of adjacent Seismic Category I structures when subjected to design seismic loads. The purpose of the Auxiliary Boiler enclosure is to provide physical support, shelter, and protection for the nonsafety-related Auxiliary Steam System components and its supporting systems. Major components housed in the building include the heating boilers, deaerator, water heaters, boiler pumps, fans, blowers, piping and piping components, controls and instrumentation, electrical panels and enclosures, and exhaust stacks. The Auxiliary Boiler enclosure is in the vicinity of the Reactor Enclosure and ~~over the Auxiliary Boiler Pipe Tunnel~~ and is therefore, in scope of license renewal.

Auxiliary Boiler Pipe Tunnel

The **nonsafety-related** Auxiliary Boiler Pipe Tunnel is a reinforced concrete rectangular box enclosure located under the Auxiliary Boiler enclosure and the Lube Oil Storage enclosure and runs north to the Turbine Enclosure. It is located adjacent to the Unit 2 Reactor Enclosure. The tunnel is approximately 174 feet in length and 21 feet in width and between 8 feet and 12 feet high. The bottom slab is founded on bedrock or on fill material. The roof of the slab is approximately 18 inches thick and its roof is flush with grade. The purpose of the Auxiliary Boiler Pipe Tunnel is to provide structural support for Unit 1 and Unit 2 piping and the structures founded on the tunnel. The pipe tunnel **is in the vicinity of the Reactor Enclosure and** houses safety-related and nonsafety-related piping into the power block. Therefore it is in scope of license renewal.

Lube Oil Storage Enclosure:

The Lube Oil Storage enclosure is a Seismic Category II precast concrete panel enclosure which attaches to, and uses the southern side of the Auxiliary Boiler enclosure exterior masonry block wall as part of the enclosure. The building is approximately 21 feet by 32 feet in plan area and is a single story structure which houses lubricating oil and instrument calibration equipment and work areas along with miscellaneous portable equipment. The roof is made of precast concrete panels with a built up elastomer exterior coating. The exterior walls are comprised of precast concrete panels, secured to the steel frame. The enclosure is located above a below-grade pipe tunnel which contains miscellaneous safety-related and nonsafety-related piping. The pipe tunnel foundation consists of a below grade reinforced concrete slab supported by fill. The Lube Oil Storage enclosure is a nonsafety-related structure designed to commercial grade standards. This structure is separated from safety-related systems, structures, and components (SCCs) such that its failure would not impact a safety-related function.

The purpose of the Lube Oil Storage enclosure is to provide physical support, shelter, and protection for the nonsafety-related equipment located inside the enclosure. The Lube Oil Storage enclosure does not perform an intended function and is therefore, not in scope of license renewal.

Fuel Oil Pump House Enclosure:

The Fuel Oil Pump House enclosure is a Seismic Category II structural steel and concrete structure with precast concrete exterior panels located south of the powerblock. The building is a single story structure. The enclosure is approximately 25 feet by 40 feet in plan area and houses the fuel oil transfer and supply pumps and associated control equipment. The building foundation consists of a reinforced concrete slab on grade supported on fill. The roof is made of precast concrete panels with a built up elastomer exterior coating. The exterior enclosures are composed of precast concrete panels and secured to the steel frame.

The purpose of the Fuel Oil Pump House enclosure is to provide physical support, shelter and protection for the nonsafety-related fuel oil transfer and fuel oil supply pumps that provide fuel to the fuel oil storage tank and feed oil to the nonsafety-related auxiliary boilers and supporting equipment. The Fuel Oil Pump House enclosure houses components required for fire protection, as required by 10 CFR 50.48 and are therefore, in scope of license renewal.

Included in the boundary of the Auxiliary Boiler and Lube Oil Storage Enclosure which also includes the Fuel Oil Pump House enclosure and the Auxiliary Boiler Pipe Tunnel is structural bolting, cable trays and gutters, seismic gap filler, conduit, concrete, concrete anchors and embedments, doors, hatches and plugs, masonry walls, metal components including decking and siding, miscellaneous steel, penetration seals, penetration sleeves, precast panels, roof scuppers, tube track, panels, racks, cabinets and other enclosures, roofing, seals, gaskets, and moisture barriers. These structures either house components required for fire protection, as required by 10 CFR 50.48, or protect safety-related components and are therefore, in scope of license renewal.

Not included in the boundary of the Auxiliary and Lube Oil Storage Enclosure which includes the Fuel Oil Pump House and Auxiliary Boiler Pipe Tunnel are component supports, cranes and hoists, and fire barriers. Component supports are identified and separately evaluated in the Component Support Commodity Group section. Cranes and hoists are evaluated separately with the Cranes and Hoists system. Fire barriers are identified and evaluated with the license renewal Fire Protection System. Also not included are the Auxiliary

Boiler and Lube Oil Storage Enclosures are the RHRSW and ESW systems, which are evaluated separately with the license renewal Safety Related Service Water System. Also not included are the Auxiliary Boiler and Lube Oil and Lube Oil components. These components are evaluated separately within the Auxiliary Steam System. The fire protection piping in the enclosures are evaluated within the Fire Protection System.

For more detailed information, see UFSAR Sections 3.2.1, 3.7.2.8, 3.7.3 and 10.4.10.2.

Reason for Scope Determination

The Auxiliary Boiler and Lube Oil Storage Enclosure which, includes the Fuel Oil Pump House Enclosure and Auxiliary Boiler Pump House Pipe Tunnel is not in scope under 10 CFR 54.4(a)(1) because no portions of the enclosures are safety-related or relied upon to remain functional during and following design basis events. The Auxiliary Boiler ~~and Lube Oil Storage including the Fuel Oil Pump House~~ Enclosure and Auxiliary Boiler ~~Pump House~~ Pipe Tunnel meet 10 CFR 54.4(a)(2) because failure of nonsafety-related portions of the enclosures could prevent satisfactory accomplishment of function(s) identified for 10 CFR 54.4(a)(1). The Auxiliary Boiler ~~and Lube Oil Storage~~ Enclosure including **and** the Fuel Oil Pump House Enclosure ~~and Auxiliary Boiler Pump House Pipe Tunnel~~ also meets 10 CFR 54.4(a)(3) because it is relied upon in the safety analyses and plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for Fire Protection (10 CFR 50.48). The Auxiliary Boiler and Lube Oil Storage Enclosure including the Fuel Oil Pump House Enclosure and Auxiliary Boiler ~~Pump House~~ Pipe Tunnel is not relied upon in any safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for Environmental Qualification (10 CFR 50.49), Anticipated Transient Without Scram (10 CFR 50.62), and Station Blackout (10 CFR 50.63).

As a result of the response to RAI 2.1-4 provided in Enclosure A of this letter, LRA Table 3.3.2-14, pages 3.3-180 and 3.3-181, are revised as shown below:

Table 3.3.2-14 Primary Containment Instrument Gas 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 - Dry (Internal)	None	None	VII.J.AP-22	3.3.1-120	A
			Air/Gas - Wetted (Internal)	Loss of Material	Compressed Air Monitoring (B.2.1.15)	VII.D.AP-81	3.3.1-56	A
					Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)	VII.F1.AP-99	3.3.1-94	C
	Structural Support	Aluminum Alloy	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-135	3.3.1-113	A
			Air/Gas - Wetted (Internal)	Loss of Material	Compressed Air Monitoring (B.2.1.15)	VII.F1.AP-142	3.3.1-92	E, 1
		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
			Air/Gas - Wetted (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)	VII.G.A-23	3.3.1-89	A
		Copper	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-144	3.3.1-114	A
			Air/Gas - Wetted (Internal)	Loss of Material	Compressed Air Monitoring (B.2.1.15)	VII.D.AP-240	3.3.1-54	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	Compressed Air Monitoring (B.2.1.15)	VII.D.AP-81	3.3.1-56	A	
		Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)		VII.F1.AP-99	3.3.1-94	C		
Strainer (Element)	Filter	Copper Alloy with less than 15% Zinc	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-144	3.3.1-114	A
			Air/Gas - Dry (Internal)	None	None	VII.J.AP-9	3.3.1-114	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

Table 3.3.2-14 Primary Containment Instrument Gas 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/Gas - Wetted (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)	VII.G.A-23	3.3.1-89	A	
		Copper Alloy with less than 15% Zinc	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-144	3.3.1-114	A	
			Air/Gas - Wetted (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)	VII.G.AP-143	3.3.1-89	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.F1.AP-99	3.3.1-94	C	
	Pressure Boundary	Stainless Steel	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-17	3.3.1-120	A	
			Air/Gas - Dry (Internal)	None	None	VII.J.AP-22	3.3.1-120	A	
			Air/Gas - Wetted (Internal)	Loss of Material	Compressed Air Monitoring (B.2.1.15)	VII.D.AP-81	3.3.1-56	A	
					Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)	VII.F1.AP-99	3.3.1-94	C	
		Zinc	Air - Indoor, Uncontrolled (External)	None	None			F, 2	
			Air/Gas - Dry (Internal)	None	None			F, 2	
	Structural Support	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
				Air/Gas - Wetted (Internal)	Loss of Material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)	VII.G.A-23	3.3.1-89	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	Compressed Air Monitoring (B.2.1.15)	VII.D.AP-81	3.3.1-56	A	

As a result of the response to RAI 2.1-4, relative to the scoping of nonsafety-related piping components connected to and providing structural support for safety-related SSCs, the following change is being made to LRA Section 2.1.5.2, starting on page 2.1-19:

Connected to and Provide Structural Support for Safety-Related SSCs

For nonsafety-related piping directly connected to safety-related piping, the nonsafety-related piping was assumed to provide structural support to the safety-related piping, unless otherwise confirmed by a review of the installation details.

The nonsafety-related piping was included in scope for 10 CFR 54.4(a)(2), up to one of the following:

1. The first seismic anchor. A seismic anchor is defined as a device or structure that ensures that forces and moments are restrained in three (3) orthogonal directions.
2. A series of supports that have been evaluated as a part of a plant-specific piping design analysis to ensure that forces and moments are restrained in three (3) orthogonal directions.
3. A combination of restraints or supports that encompasses at least two (2) supports in each of three (3) orthogonal directions.
4. A base-mounted component (pump, heat exchanger, tank, etc.) that is a rugged component and is designed not to impose loads on connecting piping. The base-mounted component is included in the scope of license renewal as it has a structural support function for the safety-related piping.
5. A flexible connection that is considered a pipe stress analysis model end point when the flexible connection effectively decouples the piping system (i.e., does not support loads or transfer loads across it to connecting piping).
6. A free end of nonsafety-related piping, such as a drain pipe that ends at an open floor drain.
7. For nonsafety-related piping runs that are connected at both ends to safety-related piping, the entire run of nonsafety-related piping is included in scope.
8. ***Smaller branch lines, where the moment of inertia ratio of the larger piping to the smaller branch piping is equal to or greater than that defined by the design bases, do not need to be considered relative to the structural support of the larger piping. For Limerick, if the ratio of the larger piping to smaller piping outside diameter is greater than or equal to 3 to 1, the branch piping is considered decoupled from the large piping stress analysis and the tee to the larger piping is considered an anchor for the smaller branch piping.***

These scoping boundaries are determined from review of the physical installation details, design drawings or seismic analysis calculations.

As a result of the response to RAI 2.1-6 provided in Enclosure A of this letter, LRA Section 2.3.4.2, Table 2.3.4-2 and Table 3.4.2-2 for the Condensate System are revised as follows:

Section 2.3.4.2, page 2.3-178, Boundary description, paragraph 4 for nonsafety-related piping directly connected to safety-related piping:

Also included in the license renewal scoping boundary of the Condensate System are those portions of nonsafety-related piping and equipment that extend beyond the safety-related to nonsafety-related interface up to the location of the first seismic anchor, or to a point no longer in proximity to equipment performing a safety-related function, whichever extends furthest. This includes the nonsafety-related portions of the system located within the Reactor Enclosure, ~~and~~ Auxiliary Boiler and Lube Oil Storage Enclosure, **and Radwaste Enclosure**. Included in this boundary are pressure-retaining components relied upon to preserve the leakage boundary **and structural support** intended functions of this portion of the system. For more information, refer to the License Renewal Boundary Drawing for identification of this boundary, shown in red.

Section 2.3.4.2, page 2.3-179, Intended Functions, function 2:

2. Resist nonsafety-related SSC failure that could prevent satisfactory accomplishment of a safety-related function. The Condensate System contains nonsafety-related fluid filled lines in the Reactor Enclosure, Control Enclosure, Auxiliary Boiler and Lube Oil Storage Enclosure, **Radwaste Enclosure**, and Turbine Enclosure which provide structural support or have potential spatial interactions with safety-related SSCs. 10 CFR 54.4(a)(2)

Table 2.3.4-2, page 2.3-181:

**Table 2.3.4-2 Condensate System
Component Subject to Aging Management Review**

Component Type	Intended Function
Bolting	Mechanical Closure
Expansion Joints	Leakage Boundary
Flow Device	Leakage Boundary
Piping, piping components, and piping elements	Leakage Boundary
	Pressure Boundary
	Structural Support
Valve Body	Leakage Boundary
	Pressure Boundary

Table 3.4.2-2, page 3.4-34:

Table 3.4.2-2 Condensate 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	Leakage Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	One-Time Inspection (B.2.1.22)	VIII.E.SP-73	3.4.1-14	A
					Water Chemistry (B.2.1.2)	VIII.E.SP-73	3.4.1-14	A
				Wall Thinning	Flow-Accelerated Corrosion (B.2.1.10)	VIII.E.S-16	3.4.1-5	A
		Stainless Steel	Air - Indoor, Uncontrolled (External)	None	None	VIII.I.SP-12	3.4.1-58	A
				Treated Water (Internal)	Loss of Material	One-Time Inspection (B.2.1.22)	VIII.E.SP-87	3.4.1-16
			Water Chemistry (B.2.1.2)			VIII.E.SP-87	3.4.1-16	A
	Pressure Boundary	Stainless Steel	Air - Indoor, Uncontrolled (External)	None	None	VIII.I.SP-12	3.4.1-58	A
				Treated Water (Internal)	Loss of Material	One-Time Inspection (B.2.1.22)	VIII.E.SP-87	3.4.1-16
		Water Chemistry (B.2.1.2)	VIII.E.SP-87			3.4.1-16	A	
	Structural Support	Stainless Steel	Air - Indoor, Uncontrolled (External)	None	None	VIII.I.SP-12	3.4.1-58	A
Treated Water (Internal)				Loss of Material	One-Time Inspection (B.2.1.22)	VIII.E.SP-87	3.4.1-16	A
			Water Chemistry (B.2.1.2)		VIII.E.SP-87	3.4.1-16	A	

As a result of the response to RAI 2.1-6 provided in Enclosure A of this letter, LRA Section 2.3.3.22, Table 2.3.3-22, Section 3.3.2.1.22, Table 3.3.1, and Table 3.3.2-22 for the Safety Related Service Water System are revised as follows:

Section 2.3.3.22, page 2.3-152, Boundary description, paragraph 4:

The RHR heat exchanger tube corrosion monitoring subsystem is not in scope for license renewal except for the supply and return piping from the SRSW System, **specimen chamber, and specimen service water pump required to provide structural support**, including the closed double valves that isolate this inactive system from the active SRSW System.

Section 2.3.3.22, page 2.3-153, Intended Functions, function 5:

5. Resist nonsafety-related SSC failure that could prevent satisfactory accomplishment of a safety-related function. The Safety Related Service Water system contains nonsafety-related fluid filled lines in the Reactor Enclosure, Diesel Generator Enclosure, Control Enclosure and Spray Pond Pump House which provide structural support or have potential spatial interactions with safety-related SSC. **The Safety Related Service Water system contains nonsafety-related non-fluid filled lines in the Reactor Enclosure which provide structural support to safety-related SSC.** 10 CFR 54.4(a)(2)

Table 2.3.3-22, page 2.3-155:

**Table 2.3.3-22 Safety Related Service Water System
Component Subject to Aging Management Review**

Component Type	Intended Function
Bolting	Mechanical Closure
Expansion Joints (EDG HTX)	Pressure Boundary
Expansion Joints (RHR motor oil cooler)	Pressure Boundary
Flow Device	Leakage Boundary
Heat Exchanger Components (ECCS Room Coolers)	Heat Transfer
	Pressure Boundary
Heat Exchanger Components (EDG HTX)	Heat Transfer
	Pressure Boundary
Heat Exchanger Components (MCR Chiller Condenser)	Heat Transfer
	Pressure Boundary
Heat Exchanger Components (RHR HTX)	Heat Transfer
	Pressure Boundary
Heat Exchanger Components (RHR Pump Motor Oil Cooler)	Heat Transfer
	Pressure Boundary
Piping, piping components, and piping elements	Leakage Boundary
	Pressure Boundary
	Structural Support
Pump Casing	Pressure Boundary
Spray Nozzles	Spray
Valve Body	Pressure Boundary
Pump Casing (Specimen Service Water Pump)	Structural Support
Heat Exchanger Components (Specimen Chamber)	Structural Support

Section 3.3.2.1.22: page 3.3-26 and 27, List of Aging Management Programs:

Aging Management Programs

The following aging management programs manage the aging effects for the Safety Related Service Water System components:

- Bolting Integrity (B.2.1.11)
- Buried and Underground Piping and Tanks (B.2.1.29)
- External Surfaces Monitoring of Mechanical Components (B.2.1.25)
- Open-Cycle Cooling Water System (B.2.1.12)
- ***Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)***

Table 3.3.1, page 3.3-74:

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
3.3.1-95	Copper alloy, Stainless steel, Nickel alloy, Steel Piping, piping components, and piping elements, Heat exchanger components, Piping, piping components, and piping elements; tanks exposed to Waste water, Condensation (Internal)	Loss of material due to pitting, crevice, and microbiologically-influenced corrosion	Chapter XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components"	No	Consistent with NUREG-1801. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26) program will be used to manage the loss of material in carbon steel, stainless steel, and nickel alloy piping, piping components, and piping elements, ducting components, and tanks exposed to air-gas/wetted or waste water in the Containment Atmospheric Control System, Control Enclosure Ventilation System, Control Rod Drive System, Emergency Diesel Generator System, Fuel Pool Cooling and Cleanup System, Plant Drainage System, Primary Containment Instrument Gas System, Primary Containment Leak Testing System, Primary Containment Ventilation System, Radwaste System, and Reactor Enclosure Ventilation System, and Safety Related Service Water System.

Table 3.3.2-22, page 3.3-231:

Table 3.3.2-22

Safety Related Service 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	Pressure Boundary	Stainless Steel	Air - Indoor, Uncontrolled (External)	None	None	VII.J.AP-17	3.3.1-120	A
			Air - Outdoor (External)	Loss of Material	Buried and Underground Piping and Tanks (B.2.1.29)	VII.C3.AP-221	3.3.1-6	E, 1
			Raw Water (Internal)	Loss of Material	Open-Cycle Cooling Water System (B.2.1.12)	VII.C1.A-54	3.3.1-40	A
Heat Exchanger Components (Specimen Chamber)	Structural Support	Stainless Steel	<i>Air-Indoor, Uncontrolled (External)</i>	<i>None</i>	<i>None</i>	<i>VII.J.AP-17</i>	<i>3.3.1-120</i>	<i>A</i>
			<i>Air/gas-wetted (Internal)</i>	<i>Loss of Material-Pitting, Crevice, and Microbiologically Induced Corrosion</i>	<i>Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)</i>	<i>VII.E5.AP-273</i>	<i>3.3.1-95</i>	<i>C</i>
Pump Casing (Specimen Service Water Pump)	Structural Support	Carbon Steel	<i>Air-Indoor, Uncontrolled (External)</i>	<i>Loss of Material-General Corrosion</i>	<i>External Surfaces Monitoring of Mechanical Components (B.2.1.25)</i>	<i>VII.I.A-77</i>	<i>3.3.1-78</i>	<i>A</i>
			<i>Air/Gas-Wetted (Internal)</i>	<i>Loss of Material-General, Pitting, Crevice, and Microbiologically Induced Corrosion</i>	<i>Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)</i>	<i>VII.E5.AP-280</i>	<i>3.3.1-95</i>	<i>A</i>
Piping, Piping Components and Piping Elements	Structural Support	Carbon Steel	<i>Air-Indoor, Uncontrolled (External)</i>	<i>Loss of Material-General Corrosion</i>	<i>External Surfaces Monitoring of Mechanical Components (B.2.1.25)</i>	<i>VII.I.A-77</i>	<i>3.3.1-78</i>	<i>A</i>
			<i>Air/Gas-Wetted (Internal)</i>	<i>Loss of Material-General, Pitting, Crevice, and Microbiologically Induced Corrosion</i>	<i>Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26)</i>	<i>VII.E5.AP-280</i>	<i>3.3.1-95</i>	<i>A</i>

As a result of the response to RAI 2.1-7 provided in Enclosure A of this letter, LRA Section 2.4.11, Table 2.4-11, and Table 3.5.2-11 for the Primary Containment are revised as follows:

Section 2.4.11, Primary Containment, Description, last paragraph on page 2.4-45 and continuing to 2.4-46 and including the next paragraph:

Included in the boundary of the Primary Containment are the reinforced concrete components that make up the Primary Containment and internal concrete structures. Steel elements and components in the boundary of the Primary Containment include energy absorbers, reactor pressure vessel (RPV) and reactor shield transfer girders, reactor shield, seismic stabilizer and RPV stabilizer, steel columns, downcomers and bracing, vacuum relief valves and piping, refueling bellows assembly, seal plate, debris screens, grating and bars, liner, liner anchors and integral attachments, and the drywell head. Other components included in the boundary of the Primary Containment are bolting (containment closure and structural), cable trays and gutters, Service Level 1 coatings, concrete anchors and embedments, conduit, doors (reactor shield doors and plugs), electrical penetration seals, hatches and plugs, metal components (***abandoned monorail steel***, permanent drywell shielding and all structural members), ***metal decking***, miscellaneous steel, panels, racks and other enclosures, penetration sleeves, personnel airlock, equipment, CRD, and other hatches and closures, pipe whip restraints and jet impingement shields, seals and gaskets, seismic gap filler, sliding (support surfaces), tube track, and includes internal structures mentioned above. Refer to the "Components Subject to Aging Management Review" table below for a complete list of components included in the boundary of the Primary Containment.

The Containment Structure performs intended functions delineated in 10 CFR 54.4 and is in scope for license renewal in its entirety; ~~except for the metal form decking and abandoned steel under the diaphragm slab which does not perform an intended function.~~

Table 2.4-11 Primary Containment, Components Subject to Aging Management Review, page 2.4-49:

Component Type	Intended Function
Electrical Penetration Assembly	Structural Pressure Boundary
Hatches/Plugs	Missile Barrier
	Shelter, Protection
	Structural Pressure Boundary
Metal components: (Permanent Drywell Shielding)	Shielding
	Structural Support
Metal components: All structural members (<i>includes abandoned monorail steel</i>)	Structural Support
Metal Decking	Structural Support
Miscellaneous steel (catwalks, stairs, handrails, ladders, platforms, etc.)	Structural Support
Panels, Racks, Cabinets, and Other Enclosures	Shelter, Protection
	Structural Support
Penetration sleeves: (includes caps for spares)	Shelter, Protection
	Structural Pressure Boundary
	Structural Support
Personnel airlock, equipment hatch, CRD hatch	Missile Barrier
	Shelter, Protection
	Structural Pressure Boundary
Personnel airlock, equipment hatch, CRD hatch: Locks, hinges, and closure mechanisms	Structural Pressure Boundary
	Structural Support
Pipe Whip Restraints and Jet Impingement Shields	Pipe Whip Restraint
	Shelter, Protection
Seals and gaskets	Structural Pressure Boundary
Seismic Gap Filler	Expansion/Separation
Service Level I Coatings	Maintain Adhesion
Sliding (support) surfaces	Structural Support
Steel Components (Energy Absorbers)	Pipe Whip Restraint
Steel Components (RPV Stabilizer)	Structural Support
Steel Components (RPV Transfer Girder and Reactor Shield Transfer Girder)	Structural Support
Steel Components (Reactor Shield)	Missile Barrier
	Shelter, Protection
	Shielding
	Structural Support
Steel Components (Seismic Stabilizer)	Structural Support
Steel Components (Steel Columns in Suppression Pool)	Structural Support
Steel elements: diaphragm slab liner, liner anchors, integral attachments	Direct Flow

Table 3.5.2-11, page 3.5-172:

Table 3.5.2-11

Primary Containment

(Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Item	Table 1 Item	Notes
Metal components: (Permanent Drywell Shielding)	Structural Support	Carbon Steel	Air - Indoor, Uncontrolled	Loss of Material	Structures Monitoring (B.2.1.35)	III.A4.TP-302	3.5.1-77	C
		Fiberglass	Air - Indoor, Uncontrolled	None	None			J, 4
Metal components: All structural members, (<i>includes abandoned monorail steel</i>)	Structural Support	Carbon Steel	Air - Indoor, Uncontrolled	Loss of Material	Structures Monitoring (B.2.1.35)	III.A4.TP-302	3.5.1-77	A
		Galvanized Steel	Air - Indoor, Uncontrolled	None	None	III.B5.TP-8	3.5.1-95	A
Metal Decking	Structural Support	Galvanized Steel	Air - Indoor, Uncontrolled	Loss of Material	Structures Monitoring (B.2.1.35)	III.A4.TP-302	3.5.1-77	A
Miscellaneous steel (catwalks, stairs, handrails, ladders, platforms, etc.)	Structural Support	Aluminum	Air - Indoor, Uncontrolled	None	None	III.B5.TP-8	3.5.1-95	A
		Carbon Steel	Air - Indoor, Uncontrolled	Loss of Material	Structures Monitoring (B.2.1.35)	III.A4.TP-302	3.5.1-77	A
		Galvanized Steel	Air - Indoor, Uncontrolled	None	None	III.B5.TP-8	3.5.1-95	A
		Stainless Steel	Air - Indoor, Uncontrolled	None	None	III.B5.TP-8	3.5.1-95	A
Panels, Racks, Cabinets, and Other Enclosures	Shelter, Protection	Carbon Steel	Air - Indoor, Uncontrolled	Loss of Material	Structures Monitoring (B.2.1.35)	III.A4.TP-302	3.5.1-77	C
		Galvanized Steel	Air - Indoor, Uncontrolled	None	None	III.B3.TP-8	3.5.1-95	C
		Stainless Steel	Air - Indoor, Uncontrolled	None	None	III.B3.TP-8	3.5.1-95	C
	Structural Support	Carbon Steel	Air - Indoor, Uncontrolled	Loss of Material	Structures Monitoring (B.2.1.35)	III.A4.TP-302	3.5.1-77	C
		Galvanized Steel	Air - Indoor, Uncontrolled	None	None	III.B3.TP-8	3.5.1-95	C
		Stainless Steel	Air - Indoor, Uncontrolled	None	None	III.B3.TP-8	3.5.1-95	C