



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

December 9, 2011

Mr. Michael P. Gallagher  
Vice President License Renewal Projects  
Exelon Generation Company, LLC  
200 Exelon Way  
Kennett Square, PA 19348

SUBJECT: SCOPING AND SCREENING METHODOLOGY AUDIT REPORT REGARDING  
THE LIMERICK GENERATING STATION, UNITS 1 AND 2 (TAC NOS. ME6555,  
ME6556)

Dear Mr. Gallagher:

By letter, dated June 22, 2011, Exelon Generation Company, LLC (or the applicant) submitted an application for renewal of operating licenses NPF-39 and NPF-85 for the Limerick Generating Station (LGS) Units 1 and 2. On September 23, 2011, the staff of the U.S. Nuclear Regulatory Commission (NRC or the staff) completed the on-site audit of the scoping and screening methodology. The audit report is enclosed.

If you have any questions, please contact me by telephone at (301) 415-3733 or by e-mail at [Robert.Kuntz@nrc.gov](mailto:Robert.Kuntz@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "R. Kuntz", written over a horizontal line.

Robert F. Kuntz, Senior Project Manager  
Projects Branch 1  
Division of License Renewal  
Office of Nuclear Reactor Regulation

Docket Nos. 50-352 and 50-353

Enclosure:  
As stated

cc: Listserv

SCOPING AND SCREENING METHODOLOGY AUDIT REPORT FOR  
THE LIMERICK GENERATING STATION  
LICENSE RENEWAL APPLICATION

**I. Introduction**

The Division of License Renewal performed an audit of the Limerick Generating Station, Units 1 and 2 (LGS; the applicant), license renewal scoping and screening methodology, developed to support the LGS license renewal application (LRA). The audit was performed during the week of September 19-23, 2011, at the applicant's facility located in Montgomery County, Pennsylvania. The purpose of the audit was to review the applicant's administrative controls governing implementation of the scoping and screening methodology and the technical basis for selected scoping and screening results for various plant systems, structures, and components (SSCs). The audit team also reviewed selected examples of component material and environment combinations, information contained in the applicant's corrective action database relevant to plant-specific age-related degradation, quality practices applied during development of the LRA and the training of personnel who participated in the development of the LRA.

The regulatory bases for the audit were Title 10 of the *Code of Federal Regulations*, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," (10 CFR Part 54) and NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants," Revision 2 (SRP-LR). In addition, the applicant developed the LRA in accordance with the guidance contained in Nuclear Energy Institute (NEI) 95-10, "Industry Guidelines for Implementing the Requirements of 10 CFR Part 54 – The License Renewal Rule," Revision 6 (NEI 95-10), which the NRC has endorsed via Regulatory Guide 1.188, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses," (RG 1.188).

**II. Background**

10 CFR 54.21, "Contents of Application – Technical Information," requires that each application for license renewal contain an integrated plant assessment (IPA). The IPA must list, for SSCs within the scope of license renewal, the structures and components (SCs) that are subject to an aging management review (AMR). 10 CFR 54.4(a), "Scope," provides the criteria for inclusion of SSCs within the scope of license renewal and 10 CFR 54.21(a)(1) requires that SCs within the scope of license renewal, that are determined to be passive and not periodically replaced, are subject to an AMR.

**III. Scoping Methodology**

The scoping evaluations for the LRA were performed by the applicant's license renewal project personnel. The audit team conducted detailed discussions with the applicant's management and staff. In addition, the audit team reviewed documentation pertinent to the scoping process. The audit team assessed whether the scoping methodology outlined in the LRA and implementing procedures was appropriately implemented and consistent with 10 CFR Part 54.

ENCLOSURE

### Verification of Scoping and Screening Results for Portions of Sampled Systems

The audit team reviewed a sample of documented scoping results for portions of the safety-related service water system and the turbine building. In addition, the staff performed walk-downs of selected portions of the following systems:

- essential service water
- fuel pool cooling and cleanup system
- emergency diesel generator system
- fuel oil transfer and air start subsystems

### Verification of Scoping and Screening Results for Sampled Components

The audit team conducted a review of selected components from the applicant's controlled plant equipment database to confirm the results of the applicant's determination of whether components were within the scope of license renewal and subject to an AMR. The audit team reviewed the selected components, which included mechanical, electrical and structural components, using the Updated Final Safety Analysis Report (UFSAR); system information; and piping and instrumentation drawings to perform its review. The controlled plant equipment database, which provided a list of components, was a primary source of information used during the license renewal scoping and screening process, including scoping and screening reviews, aging management reviews, and assignment of aging management programs (AMP).

The NRC staff independently selected a random sample of eighty-five components from the approximately one hundred and ninety thousand components listed in the plant equipment database and reviewed the component information to determine whether the components were appropriately included within the scope of license renewal and determined to be subject to an AMR. The staff reviewed the component information including the component name, system, function, tag number, location and other documentation. Of the eighty-five randomly selected components, the applicant had included fifty-nine components within the scope of license renewal and determined the components to be subject to an AMR. The applicant had determined twenty-six components were either not within the scope of license renewal or not subject to an AMR (because the component was active or replaced on a periodic basis). The NRC staff reviewed the twenty-six components and confirmed the applicant's conclusion that the twenty-six components were not required to be within the scope of license renewal or subject to an AMR, as applicable.

### Areas Requiring Additional Information

The audit team determined that the applicant's scoping methodology was generally consistent with the requirements of 10 CFR Part 54 for the identification of SSCs that meet the scoping criteria of 10 CFR 54.4(a). However, the audit team determined that additional information was required in order for the staff to complete its review:

- The applicant's procedure CC-MA-304, "Establishing and Maintaining Component Classification," that provides direction on the process to populate the "Q" field in the

plant equipment database (used, in part, to identify safety-related SSCs within the scope of license renewal) refers to 10 CFR Part 100 as opposed 10 CFR 50.67, although Limerick is an alternate source term plant such that 10 CFR 50.67 is applicable.

- Several plant systems discussed in the UFSAR are not identified in the LRA. Systems nomenclature had been organized to correspond with the system information contained in NUREG 1801, "Generic Aging Lessons Learned (GALL) Report," but the process was not described in the LRA.
- The lube oil building, located above the auxiliary boiler pipe tunnel (which contains SR pipe), is not included within the scope of license renewal.
- The applicant did not consistently identify the required supports on all branch connections for nonsafety-related pipe attached to safety-related SSCs.
- The applicant had not included a portion of nonsafety-related pipe, attached to safety-related SSCs, up to and including an anchor or bounding condition within the scope of license renewal. Instead, the applicant identified an anchor directly at the nonsafety-related/safety-related interface (or very close to the interface, on the safety-related side of the interface).
- The applicant did not specifically identify the anchor or bounding condition required for the structural support of nonsafety-related pipes attached to safety-related SSCs, if the nonsafety-related pipe was included within the scope of license renewal for spatial interaction.

#### **IV. Screening Methodology**

The audit team reviewed the methodology used by the applicant to determine if mechanical, structural, and electrical components within the scope of license renewal would be subject to an AMR (screening). The applicant provided the audit team with a detailed discussion of the processes used for each discipline and used the safety-related service water and turbine building as examples in their scoping and screening presentations. The audit team reviewed the applicable implementing procedures and reports and focused on a sample of the documentation for the safety-related service water and the turbine building. The audit team noted that the applicant's screening process was performed in accordance with its written requirements and was consistent with the guidance provided in the SRP-LR and NEI 95-10. The audit team determined that the screening methodology was consistent with the requirements of 10 CFR Part 54 for the identification of SSCs that meet the screening criteria of 10 CFR 54.21(a)(1).

#### **V. Component Material and Environment Combinations**

The staff performed a review to confirm a sample of the component material and environment information contained in the LRA. The staff reviewed the applicant's documentation during the scoping and screening methodology audit and performed the walk-downs during the AMP audit performed during the weeks of October 3 and October 11, 2011.

The NRC staff independently selected a random sample of thirty-five components from the "Summary of Aging Management Evaluation" tables (AMR line items) contained in Section 3 of the LRA. The staff verified the information either during a walkdown or through review of the applicant's reference documents. These reference documents included the UFSAR; plant system and design drawings; and component vendor manuals. The staff was able to visually inspect sixteen of the thirty-five selected components.

During the staff review of the thirty-five components, thirty-four of the component material environment combinations were confirmed by the staff.

The staff determined that additional information was required in order for the staff to complete its review.

- The EHC drain tank in the main turbine system (LRA Table 3.4.2-7), exposed to an environment of air/gas-wetted (internal), is listed as having stainless steel as the construction material. This could not be verified by a walkdown or in the documentation provided.

## **VI. Site-Specific Operating Experience**

The SRP-LR provides guidance to the staff on the process to be followed when assessing the ten program elements for each AMP submitted in an LRA. Operating experience (OE) is one of the ten elements and is defined in the SRP-LR and the GALL Report. The site-specific and industry OE also relates to two other AMP elements: detection of aging effects and monitoring and trending. The SRP-LR addresses the importance of the applicant's specific OE in relation to scoping and screening, aging management review, and time-limited aging analysis activities. During the scoping and screening methodology audit, the staff performed an independent search of the applicant's corrective action report database, using staff selected keywords, to identify occurrences of age-related degradation. This activity was performed independently of the applicant's review of the corrective action report database. The staff identified corrective action reports that contained information concerning age-related degradation that would be used by the staff during the performance of the AMP audit.

## **VII. Aging Management Program Quality Assurance Attributes**

The audit team reviewed the AMPs quality assurance elements to verify consistency with the staff's guidance described in SRP-LR, Appendix A, "Branch Technical Positions," Section A.2, "Quality Assurance for Aging Management Programs (Branch Technical Position IQMB-1)." The AMP quality assurance elements are corrective action, confirmation process, and administrative controls.

The applicant described the AMP quality assurance elements in LRA Appendix A, Section A.1.5, "Quality Assurance Program and Administrative Controls," and LRA Appendix B, Section B.1.3, "Quality Assurance Program and Administrative Controls," and the applicant's "Aging Management Program Quality Assurance Elements for License Renewal" document. LRA Appendices A and B stated that the applicant's existing quality assurance (QA) program will be applied to three AMP elements. The applicant's "Aging Management Program Quality Assurance Elements for License Renewal" document incorporates portions of various QA procedures required to ensure the elements of corrective action program, confirmation process,

and administrative controls are compliant with the 10 CFR Part 50, Appendix B requirements for all AMPs. The audit team reviewed the AMP basis documents and confirmed that the AMPs incorporate corrective action programs, confirmation processes, and administrative controls as described in the "Aging Management Program Quality Assurance Elements for License Renewal" document.

Based on the audit team's evaluation, review of the AMP basis documents and information contained in LRA Appendix A, Section A.1.5, and Appendix B, Section B.1.3, the staff determined the AMP quality assurance elements to be generally consistent with the staff's position regarding QA for aging management.

### **VIII. Quality Assurance Controls Applied to LRA Development**

The staff reviewed the quality controls used by the applicant during development of the LRA, which included:

- Performing scoping and screening activities using approved documents and procedures.
- Databases were employed to guide and support scoping and screening and generate license renewal documents. These databases were controlled by procedures and included:
  - license renewal database – incorporated a list of systems, scoping and screening results, AMRs, LRA generation, implementing procedure tracking, and change control
  - plant information management system – incorporated the component records list, work planning, and design control
  - electronic document management system – incorporated procedures, drawings, and controlled design information
  - maintenance rule database
  - corrective action program database

The audit team performed a review of implementing procedures and guides, examined the applicant's documentation of activities contained in reports, reviewed the applicant's activities performed to assess the quality of the LRA, and held discussions with the applicant's license renewal management and staff. The audit team determined that the applicant's activities provide assurance that the LRA was developed consistent with the applicant's license renewal program requirements.

### **IX. Training for License Renewal Project Personnel**

The staff reviewed the LGS training processes to ensure the guidelines and methodology for the scoping and screening activities were applied in a consistent and appropriate manner. As outlined in procedures, the applicant required training for personnel participating in the development of the LRA and used trained and qualified personnel to prepare the scoping and screening implementing procedures. The training included the following activities:

- Personnel were trained to the applicable project procedures and other relevant license renewal information using LGS procedure LR-LG-1004, "Training of License Renewal Project Team and Site Personnel," as appropriate to their functions.
- License renewal and subject matter expert training included:
  - 10 CFR Part 54
  - relevant NRC and industry guidance documents
  - lessons learned from other nuclear power plant license renewals
  - applicable procedures

The staff discussed training activities with the applicant's management and staff and reviewed applicable documentation. The audit team determined that the applicant had developed and implemented adequate controls for the training of personnel performing LRA activities.

## **X. Final Briefing**

A final briefing was held with the applicant on September 23, 2011, to discuss the results of the scoping and screening methodology audit. The audit team identified preliminary areas where additional information would be required to support completion of the staff's LRA review.

## **XI. Documents Reviewed**

1. NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants," Revision 2
2. NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 The License Renewal Rule," Revision 6
3. License Renewal Application - Limerick Generating Station, Units 1 and 2
4. Exelon Procedure LS-AA-120 Issue Identification and Screening Process
5. Exelon Procedure LS-AA-125 Corrective Action Program (CAP) Procedure
6. Exelon NO-AA-10 Quality Assurance Topical Report (QATR)
7. Exelon CC-MA-304 Establishing and Maintaining Component Classification
8. LR-LG-1001 License Renewal Process and Definitions
9. LR-LG-1002 Preparation of Basis Documents
10. LR-LG-1003 License Renewal Document Control
11. LR-LG-1004 Training of License Renewal Project Team and Site Personnel
12. LR-LG-1005 Scoping of Systems and Structures
13. LR-LG-1006 Screening of Systems, Structures and Commodities
14. LR-LG-1007 License Renewal Boundary Drawings
15. LR-LG-1009 Aging Management Reviews
16. LR-LG-1011 Aging Management Program Basis Documents
17. LR-LG-1012 License Renewal Change Request Process
18. LR-LG-1015 Assembly, Review, and Verification of the Draft LRA
19. LG-SSBD-A1 10 CFR 54.4(a)(1) Safety Related Systems Scoping Basis Document
20. LG-SSBD-A2 10 CFR 54.4(a)(2) System Scoping Criteria Scoping and Screening Basis Document
21. LG-SSBD-AOT Abnormal Operational Transients Scoping and Screening Basis Document
22. LG-SSBD-ATWS 10 CFR 54.4(a)(3) ATWS Systems Scoping and Screening Basis Document

23. LG-SSBD-E6 Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Sample Basis Document
24. LG-SSBD-EQ 10 CFR 54.4(a)(3) Environmental Qualification Systems Scoping and Screening Basis Document
25. LG-SSBD-FP 10 CFR 54.4(a)(3) Fire Protection Systems Scoping and Screening Basis Document
26. LG-SSBD-SBO Station Blackout Scoping Basis Document
27. LG-SSBD-SCRN Structures, Component and Commodity Types, With Active, Passive Determinations and Intended Functions Scoping and Screening Basis Document
28. LG-SSBD-SSL License Renewal Systems and Structures Basis Document
29. LG-SSBD-TEA2 Evaluation of Safety-Related Components Located in Nonsafety-Related Structures Scoping and Screening Basis Document
30. System and Structure Scoping Reports (various)
31. Component Summary Screening Reports (various)
32. License Renewal Boundary Drawings (various)
33. LGS Updated Final Safety Analysis Report (UFSAR) Revision 14

## **XII. NRC Audit Team Members**

Bill Rogers	NRR/DLR
Stacie Sakai	NRR/DLR
Angela Buford	NRR/DLR
Donald Brittner	NRR/DLR
Edward Smith	NRR/DSS
Gary Armstrong, Jr.	NRR/DSS
Michael Levine	NRR/DSS
Ogbonna Hopkins	NRR/DSS
Steven Jones	NRR/DSS
Lane Howard	DLR Contractor Southwest Research Institute
Patrick Mackin	DLR Contractor Southwest Research Institute
James Nickolaus	DSS Contractor Pacific Northwest National Laboratory

## **XIII. Applicant Personnel Contacted During Audit**

Bill Maguire	Patsy Kreamer
Pete Gardner	Mike Gallagher
Dan Doran	Al Fulvio
Bob Dickinson	John O'Rourke
Steve Bobyock	Chris Wilson
John Hunter	Nancy Ranek
Chris Cooney	Gene Kelly
Leanne Birkmire	Shannon Rafferty-Czincila
Joe Szafran	Charlotte Geiger
Ron Hess	Mary Kowalski
Jim Jordan	Mark Miller
Mike Guthrie	Deb Spamer
Dave Clohecy	Wayne Choromanski
Robert Tarr	

November 9, 2011

Mr. Michael P. Gallagher  
Vice President License Renewal Projects  
Exelon Generation Company, LLC  
200 Exelon Way  
Kennett Square, PA 19348

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Sincerely,

*/RA/*

Robert F. Kuntz, Senior Project Manager  
Projects Branch 1  
Division of License Renewal  
Office of Nuclear Reactor Regulation

Docket Nos. 50-352 and 50-353

Enclosure:  
As stated

cc: Listserv

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\*via e-mail

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DATE	12/9/11	12/9/11	12/9/11	12/9/11

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Letter to Michael Gallagher from Robert F. Kuntz dated November 9, 2011

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THE LIMERICK GENERATING STATION, UNITS 1 AND 2 (TAC NOS. ME6555,  
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