



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

March 14, 2014

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 BYRON STATION, UNITS 1 AND 2, AND BRAIDWOOD STATION, UNITS
1 AND 2, LICENSE RENEWAL APPLICATION (TAC NOS. MF1879, MF1880,
MF1881, AND MF1882)

Dear Mr. Gallagher:

By letter dated May 29, 2013, Exelon Generation Company, LLC, submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54, to renew the operating licenses NPF-37, NPF-66, NPF-72, and NPF-77 for Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2, respectively, for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). The staff completed the on-site audit of the license renewal scoping and screening methodology in two phases: July 29 through August 2, 2013, at the Byron facility located in Byron, Illinois and December 2 through 4, 2013, at the Braidwood facility located in Braceville, Illinois.

If you have any questions, please contact me at 301-415-4115 or e-mail Lindsay.Robinson@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "LR", with a long horizontal flourish extending to the right.

Lindsay R. Robinson, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-454, 50-455, 50-456, and 50-457

Enclosure:
Audit Report

cc: Listserv

March 14, 2014

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 BYRON STATION, UNITS 1 AND 2, AND BRAIDWOOD STATION, UNITS
1 AND 2, LICENSE RENEWAL APPLICATION (TAC NOS. MF1879, MF1880,
MF1881, AND MF1882)

Dear Mr. Gallagher:

By letter dated May 29, 2013, Exelon Generation Company, LLC, submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54, to renew the operating licenses NPF-37, NPF-66, NPF-72, and NPF-77 for Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2, respectively, for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). The staff completed the on-site audit of the license renewal scoping and screening methodology in two phases: July 29 through August 2, 2013, at the Byron facility located in Byron, Illinois and December 2 through 4, 2013, at the Braidwood facility located in Braceville, Illinois.

If you have any questions, please contact me at 301-415-4115 or e-mail Lindsay.Robinson@nrc.gov.

Sincerely,
/RA/
Lindsay R. Robinson, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-454, 50-455, 50-456, and 50-457

Enclosure:

Audit Report

cc: Listserv

DISTRIBUTION: See next page

ADAMS Accession No.: ML14050A304

OFFICE	LA:DLR	PM: RPB1:DLR	PM:RPB1:DLR	BC:RASB:DLR
NAME	YEdmonds	LRobinson	JDaily	MMarshall
DATE	3/5/14	3/7/14	3/6/14	3/14/14
OFFICE	BC:RPB1:DLR	PM:RPB1:DLR		
NAME	YDiazSanabria	LRobinson		
DATE	3/13/14	3/14/14		

OFFICIAL RECORD COPY

Letter to M.P. Gallagher from Lindsay R. Robinson dated March 14, 2014

SUBJECT: SCOPING AND SCREENING METHODOLOGY AUDIT REPORT REGARDING THE BYRON STATION, UNITS 1 AND 2, AND BRAIDWOOD STATION, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION (TAC NOS. MF1879, MF1880, MF1881, AND MF1882)

DISTRIBUTION

EMAIL:

PUBLIC

RidsNrrDlr Resource

RidsNrrDlrRpb1 Resource

RidsNrrDlrRasb Resource

RidsOgcMailCenter

RidsNrrPMByron Resource

RidsNrrPMBraidwood Resource

LRobinson

JDaily

DMcIntyre, OPA

EDuncan, RIII

JBenjamin, RIII

AGarmoe, RIII

JMcGhee, RIII

JRobbins, RIII

VMitlyng, RIII

PChandrathil, RIII

SCOPING AND SCREENING METHODOLOGY TRIP REPORT FOR THE BYRON AND BRAIDWOOD LICENSE RENEWAL APPLICATION

I. Introduction

The Division of License Renewal performed an audit of the Exelon Generation Company, LLC (Exelon or the applicant), Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2 (Byron and Braidwood, respectively) license renewal scoping and screening methodology, developed to support the Byron and Braidwood license renewal application (LRA). The audit was performed during the weeks of July 29 through August 2, 2013, at the applicant's Byron facility located in Byron, Illinois, and the week of December 2 through 4, 2013, at the applicant's Braidwood facility located in Braceville, Illinois. 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 that participated in the development of the LRA.

The regulatory bases for the audit are Title 10 of the *Code of Federal Regulations*, Part 54 (10 CFR Part 54), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," 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

The requirements of 10 CFR 54.21, "Contents of Application – Technical Information," state that each application for license renewal contains 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). Per 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 were appropriately implemented and consistent with 10 CFR Part 54.

Verification of Scoping and Screening Results for Sampled Systems and Components

The audit team reviewed a sample of the scoping and screening implementation for portions of the service water system, essential service water cooling towers, the turbine building and structures adjacent to containment at Byron, and the turbine building and structures adjacent to containment at Braidwood. The staff reviewed applicable portions of the Updated Final Safety Analysis Report (UFSAR), scoping and screening reports, and license renewal drawings and performed walkdowns to confirm information identified during the review.

In addition, 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 the components were within the scope of license renewal and subject to an AMR or not. The audit team reviewed the selected components (mechanical, electrical and structural) using the 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, scoping and screening reviews, AMR, and assignment of aging management programs (AMPs).

- Byron - The staff randomly selected components from Byron's plant equipment database of approximately 256,795 components. The applicant indicated for each selected component whether or not it had been included within the scope of license renewal and subject to an AMR. The selected components were then reviewed by the staff. Of the 85 randomly selected components, 29 components had been scoped by the applicant into their AMRs; 56 were considered by the applicant to be out of scope or screened out by the criteria of 10 CFR Part 54. The staff independently reviewed the 56 components that had been designated by the applicant as not subject to an AMR. Through a review of the components' description and system, the staff agreed that 56 of the components were correctly scoped and screened as not subject to an AMR for license renewal.
- Braidwood - The staff randomly selected components from Braidwood's plant equipment database of approximately 255,484 components. The applicant indicated for each selected component whether or not it had been included within the scope of license renewal and subject to an AMR. The selected components were then reviewed by the staff. Of the 85 randomly selected components, 69 components had been scoped by the applicant into their AMRs; 16 were considered by the applicant to be out of scope or screened out by the criteria of 10 CFR Part 54. The staff independently reviewed the 16 components that had been designated by the applicant as not subject to an AMR. Through a review of the components' description and system, the staff agreed that 16 of the components were correctly scoped and screened as not subject to an AMR for license renewal.

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,

applicable to both Byron and Braidwood, was required in order for the staff to complete its review:

- The methods used and the basis for any conclusions, where components identified as safety-related in the plant equipment database, were not included within the scope of license renewal in accordance with 10 CFR 54.4(a)(1).
- The methods used and the basis for any conclusions where nonsafety related structures adjacent to in-scope Category 1 safety-related structures, were not included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2).
- The methods used and the basis for any conclusions, where abandoned equipment located in spaces containing safety-related SSCs, were not included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2).

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. The audit team reviewed the applicable implementing procedures and reports and focused on a sample of the documentation for the service water system 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 verification of component material and environment information contained in the Byron and Braidwood LRA to validate the specified generic component material and environment information. The staff performed the verification for a randomly selected sample of components by performing visual verifications by walkdown and through review of plant specific reference materials.

- Byron - The staff performed the on-site material or environment verification of 35 components by walkdowns and by review of Byron's plant specific reference materials. These reference documents included Byron's UFSAR, plant system and design drawings, and component vendor manuals. The staff was able to visually inspect 28 of the 35 randomly selected generic component types from Table 2 of the LRA. The example component items selected represented components that could be readily accessed by a walkdown inside and outside of the physical site. Based on the review of the 35 selected line items, the staff found no discrepancies.
- Braidwood - The staff performed the on-site material or environment verification of 35 components by walkdowns and by review of Braidwood's plant specific reference materials. These reference documents included Braidwood's UFSAR, plant system and design drawings, and component vendor manuals. The staff was able to visually inspect 16 of the 35 randomly selected generic component types from Table 2 of the LRA. The

example component items selected represented components that could be readily accessed by a walkdown inside and outside of the physical site. Based on the review of the 35 selected line items, the staff found no discrepancies.

VI. Site-Specific Operating Experience

The staff performed an independent database search of the applicant's operating experience (OE) database to identify examples of age related degradation that should be considered in the development of AMPs. The NRC's SRP-LR provides guidance to the staff on assessing the 10 program elements for each AMP submitted in the LRA. OE is listed as one of these elements and briefly defined in the GALL Report.

The plant-specific and industry OE also relate two other AMP elements: "detection of aging effects" and "monitoring and trending." The SRP-LR also calls attention to the importance of the applicant's specific OE in relation to scoping and screening, AMR and time-limited aging analysis activities.

The staff conducted an independent database search of the applicant's plant-specific OE database for both Byron and Braidwood, identifying OE that potentially relates to age related degradation. The results of the search were provided to the Byron and Braidwood AMP audit teams for use during their review and assessment of AMPs.

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 actions, 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 Appendix B, Section B.1.3, "Quality Assurance Program and Administrative Controls," and the individual AMPs. LRA Appendices A and B stated that the applicant's existing 10 CFR Part 50 Appendix B Quality Assurance Program corrective actions, confirmation process, and administrative controls requirements are applicable to all SSCs subject to AMPs and activities required during the period of extended operation. The audit team reviewed the AMPs and confirmed that the AMPs incorporate corrective action programs, confirmation processes, and administrative controls. The applicant identified no exceptions to these program elements and specified a variety of enhancements to them for specific AMPs. Based on the audit team's evaluation and its review of the AMPs 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 quality assurance 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

- Using databases to guide and support scoping and screening and to generate license renewal documents
- Employing the standard processes for scoping, screening, and LRA preparation
- Using processes and procedures that incorporate preparation, review, comment, and owner acceptance
- Incorporating industry lessons learned and request for additional information (RAI) from other plant license renewals
- Performing external assessments including a peer review and benchmarking to recent license renewal applications
- Performing internal assessments including those performed by a challenge board, the offsite review committee, and the nuclear safety review board

The audit team performed a review of implementing procedures and guides, examined the applicant's documentation of activities 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 applicant's 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 who participated in the development of the LRA and used trained and qualified personnel to prepare the scoping and screening implementation procedures. The training included the following activities:

- Training was performed in accordance with the requirements of the Training and Reference Materials (T&RM) LR-AA-1004, "Job Familiarization of License Renewal Project Team and Site Personnel," for corporate and site personnel
- Initial qualification was required for personnel without previous license renewal experience
 - license renewal process orientation
 - license renewal T&RMs and basis documents
 - lessons learned
- Specific training on
 - site documentation
 - systems and structures
 - license renewal database

- scoping
- screening
- aging management programs

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 August 2, 2013, to discuss the results of the Byron phase of the scoping and screening methodology audit. A final briefing was held with the applicant on December 4, 2013, to discuss the results of the Braidwood phase 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 – Byron Station, Units 1 and 2; Braidwood Station, Units 1 and 2
4. LR-AA-1201, License Renewal Process and Definitions
5. LR-AA-1004, Job Familiarization of License Renewal Project Team and Site Personnel
6. LR-AA-1205, Scoping of Systems and Structures
7. LR-AA-1206, Screening of Systems, Structures, and Commodities
8. LR-AA-1207, License Renewal Boundary Drawings
9. BB-SSBD-SSL, License Renewal Systems and Structures
10. BB-SSBD-AOT, Abnormal Operational Transients (AOT)
11. BB-SSBD-A1, 10 CFR 54.4(a)(1) Safety-Related Systems
12. BB-SSBD-A2, 10 CFR 54.4(a)(2) System Scoping Criteria
13. BB-SSBD-TBA2, Evaluation of Safety-Related Components Located Within the Turbine Building
14. BB-SSBD-FP, 10 CFR 54.4(a)(3) Fire Protection Systems
15. BB-SSBD-EQ, 10 CFR 54.4(a)(3) Environmental Qualification Systems
16. BB-SSBD-PTS, 10 CFR 54.4(a)(3) Pressurized Thermal Shock (PTS)
17. BB-SSBD-ATWS, 10 CFR 54.4(a)(3) anticipated transient without scram (ATWS) Systems
18. BB-SSBD-SBO, 10 CFR 54.4(a)(3) Station Blackout

XII. NRC Audit Team Members

Bill Rogers	NRR/Division of License Renewal (DLR)
Rui Li	NRR/DLR
Angela Buford	NRR/DLR
Donald Brittner	NRR/DLR
Steven Bloom	NRR/DLR
Edward Smith	NRR/Division of Safety Systems (DSS)
Carla Roque-Cruz	NRR/DSS

Jim Nickolaus NRC Contractor

XIII. Applicant Personnel Contacted During Audit

Mike Gallagher	Al Fulvio
Don Brindle	Christine Kinkead
Don Warfel	John Hufnagel
Albert Piha	Gary Becknell
John Kozakowski	Casey Muggleston
Phil O'Donnell	Pete Tamburo
Paul Weyhmuller	John Yacyshyn
Jim Annett	Paul Cervenka
Dylan Cimock	Tony Franchitti
John Hilditch	

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 BYRON STATION, UNITS 1 AND 2, AND BRAIDWOOD STATION, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION (TAC NOS. MF1879, MF1880, MF1881, AND MF1882)

Dear Mr. Gallagher:

By letter dated May 29, 2013, Exelon Generation Company, LLC, submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54, to renew the operating licenses NPF-37, NPF-66, NPF-72, and NPF-77 for Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2, respectively, for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). The staff completed the on-site audit of the license renewal scoping and screening methodology in two phases: July 29 through August 2, 2013, at the Byron facility located in Byron, Illinois and December 2 through 4, 2013, at the Braidwood facility located in Braceville, Illinois.

If you have any questions, please contact me at 301-415-4115 or e-mail Lindsay.Robinson@nrc.gov.

Sincerely,

Lindsay R. Robinson, Project Manager
 Projects Branch 1
 Division of License Renewal
 Office of Nuclear Reactor Regulation

Docket Nos. 50-454, 50-455, 50-456, and 50-457

Enclosure:

Audit Report

cc: Listserv

DISTRIBUTION: See next page

ADAMS Accession No.: ML14050A304

OFFICE	LA:DLR	PM: RPB1:DLR	PM:RPB1:DLR	BC:RASB:DLR
NAME	YEdmonds	LRobinson	JDaily	MMarshall
DATE	3/5/14	3/7/14	3/6/14	3/14/14 <i>MM</i>
OFFICE	BC:RPB1:DLR	PM:RPB1:DLR		
NAME	YDiazSanabria	LRobinson		
DATE	3/15/14 <i>YDS</i>	3/14/14 <i>LR</i>		

OFFICIAL RECORD COPY