



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

January 13, 2014

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

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
BYRON NUCLEAR STATION, UNITS 1 AND 2, AND BRAIDWOOD NUCLEAR
STATION, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION, SET 6
(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 Regulation* (CFR) Part 54, to renew the operating licenses NPF-37, NPF-66, NPF-72, and NPF-77 for Byron Nuclear Station, Units 1 and 2, and Braidwood Nuclear Station, Units 1 and 2, respectfully, for review by the U.S. Nuclear Regulatory Commission staff. The staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete the review.

These requests for additional information were discussed with John Hufnagel, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me at 301-415-4115 or by e-mail Lindsay.Robinson@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Lindsay R. Robinson", with a long horizontal line 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:
Requests for Additional Information

cc w/encl: Listserv

January 13, 2014

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

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE BYRON NUCLEAR STATION, UNITS 1 AND 2, AND BRAIDWOOD NUCLEAR STATION, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION, SET 6 (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 10 CFR Part 54, to renew the operating licenses NPF-37, NPF-66, NPF-72, and NPF-77 for Byron Nuclear Station, Units 1 and 2, and Braidwood Nuclear Station, Units 1 and 2, respectfully, for review by the U.S. Nuclear Regulatory Commission staff. The staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete the review.

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

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Requests for Additional Information

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DISTRIBUTION: See next page

ADAMS Accession No.: ML13317A075

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NAME	lKing	LRobinson	JDaily	YDiaz-Sanabria	LRobinson
DATE	11/14/2013	11/14/2013	1/13/2014	1/13/2014	1/13/2014

OFFICIAL RECORD COPY

Letter to M. Gallagher from L. Robinson dated January 13, 2014

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
BYRON NUCLEAR STATION, UNITS 1 AND 2, AND BRAIDWOOD NUCLEAR
STATION, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION, SET 6
(TAC NOS. MF1879, MF1880, MF1881, AND MF1882)

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**BYRON NUCLEAR STATION, UNITS 1 AND 2
AND BRAIDWOOD NUCLEAR STATION, UNITS 1 AND 2
LICENSE RENEWAL APPLICATION
REQUESTS FOR ADDITIONAL INFORMATION – SET 6
(TAC NOS. MF1879, MF1880, MF1881, AND MF1882)**

RAI B.2.1.38-1

Applicability:

Byron Station (Byron) and Braidwood Station (Braidwood), all units.

Background:

The applicant stated that license renewal application (LRA) aging management program (AMP) B.2.1.38, "Insulation Material For Electrical Cables and Connections Not Subject To 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits," is a new program that is consistent with NUREG-1801 AMP XI.E2, "Insulation Material For Electrical Cables and Connections Not Subject To 10 CFR 50.49 Environmental Qualification Requirements Used In Instrumentation Circuits."

The "scope of program" program element of the LRA AMP states that the in-scope cables and connections that are used in instrumentation circuits with sensitive, high voltage, low level current signals, which are not part of the EQ program, are within the scope of this program. The applicant further stated that portions of the radiation monitoring system and portions of the reactor protection system are in scope of the program. For Braidwood, the applicant stated that source range/intermediate range neutron monitoring circuits (SR/IR) are in-scope of this program. For Byron, the SR and IR are not in scope of the program because they are managed by the Environmental Qualification of Electric Components program. Power range neutron monitoring circuits (PR) are not stated in scope for any LRA AMPs.

The Generic Aging Lessons Learned (GALL) Report AMP recommends that this AMP applies to electrical cables and connections (cable system) used in circuits with sensitive, high voltage, low-level current signals, such as radiation monitoring and nuclear instrumentation, that are subject to aging management review and installed in adverse localized environments caused by temperature, radiation, or moisture.

Issue:

The applicant did not identify power range neutron monitoring circuits as in scope of this AMP for both Byron and Braidwood or explain why these circuits are not in scope of this program.

Request:

Explain why power range neutron monitoring circuits are not in scope of AMP B.2.1.38 for both Byron and Braidwood.

ENCLOSURE

RAI B.2.1.38-2

Applicability:

Byron and Braidwood, all units.

Background:

The applicant stated that LRA AMP B.2.1.38, "Insulation Material For Electrical Cables and Connections Not Subject To 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits," is a new program that is consistent with NUREG-1801 AMP XI.E2, "Insulation Material For Electrical Cables and Connections Not Subject To 10 CFR 50.49 Environmental Qualification Requirements Used In Instrumentation Circuits."

The "detection of aging effects" program element of LRA AMP B.2.1.38 states that cable system testing will be credited as an alternative approach to the review of surveillance or calibration results and will be performed using a proven, industry accepted, cable system test for detecting deterioration of the insulation system.

The GALL Report AMP recommends that cable testing be conducted when the calibration or surveillance program does not include the cabling system in the testing circuit. A proven cable system test for detecting deterioration of the insulation system (such as insulation resistance tests, time domain reflectometry tests, or other testing judged to be effective in determining cable system insulation as justified in the application) should be performed.

Issue:

The GALL Report recommends cable system testing when the calibration or surveillance program does not include the cable system. The applicant's AMP could allow reviewing of calibration results even though the cable system is not included in the calibration or surveillance program. The applicant's AMP states that a proven, industry accepted, cable system test for detecting deterioration for the insulation will be performed. However, the applicant does not identify the type of test that can be used. In the absence of these testing techniques, the staff cannot determine the consistency of the "detection of aging effects" program element to the GALL Report.

Request:

Clarify the cable system test requirements applicability. Also, identify the testing techniques to be used for detecting deterioration of the insulation system for nuclear instrumentation circuits.

RAI B.2.1.38-3

Applicability:

Byron and Braidwood, all units.

Background:

The applicant stated that LRA AMP B.2.1.38, "Insulation Material For Electrical Cables and Connections Not Subject To 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits," is a new program that is consistent with NUREG-1801 AMP XI.E2, "Insulation Material For Electrical Cables and Connections Not Subject To 10 CFR 50.49 Environmental Qualification Requirements Used In Instrumentation Circuits."

Standard Review Plan (SRP), Table 3.0-1, Final Safety Analysis Report (FSAR) Supplement for Aging Management of Applicable Systems under AMP XI.E2, states that in cases where cables are not part of a calibration or surveillance program, a proven test (such as insulation resistance tests, time domain reflectometry tests, or other test judged to be effective as justified in the application) for detecting deterioration of insulation system are performed. LRA Section A.2.1.38 states that a proven cable test is performed in cases where cables are not included as part of the calibration or surveillance program testing circuit.

Issue:

The applicant does not identify the type of tests (e.g., such as insulation resistance tests, time domain reflectometry tests, or other test judged to be effective as justified in the application) that can be used in the updated FSAR (UFSAR) Supplement. In the absence of these testing techniques, the UFSAR Supplement is inconsistent with GALL Report AMP XI.E2 and SRP Table 3.0-1 which provides guidance on the specific tests.

Request:

Provide the testing techniques to be used for detecting deterioration of the instrumentation circuit insulation system.

RAI B.2.1.41-1

Applicability:

Byron only.

Background:

The applicant stated that LRA AMP B.2.1.41, "Fuse Holders," is a new condition monitoring program that is consistent with NUREG-1801 AMP XI.E5, "Fuse Holders."

The "acceptance criteria" program element of the applicant's site AMP Basis Document states the thermography program establishes acceptance criteria for thermography testing. When thermography is not practical, other acceptance tests are implemented, such as connection

resistance measurement. The AMP Basis Document states: "Acceptance criteria are set in accordance with good practice."

The GALL Report AMP recommends the acceptance criteria for each test are defined by the specific type of test performed and the specific type of fuse holder tested. The temperature of the metallic clamp of the fuse holder needs to be below the maximum allowed temperature for the application when thermography is used; otherwise, a low resistance value appropriate for the application when resistance measurement is used.

Issue:

"Acceptance criteria set in accordance with good practice" is unclear. An acceptance criterion consistent with the GALL Report needs to be established in order for the applicant to take corrective action. Acceptance criteria ensure that the intended function of the fuse holders can be maintained consistent with the current license basis.

Request:

Explain why the establishment of AMP B.2.1.41 "acceptance criteria as accordance with good practice" is consistent with the GALL Report and not an enhancement or exception.

RAI B.2.1.42-1

Applicability:

Byron and Braidwood, all units.

Background:

The applicant stated that LRA AMP B.2.1.42, "Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements," is a new program that is consistent with NUREG-1801 aging management program XI.E6, "Electrical Cable Connections Not Subject To 10 CFR 50.49 Environmental Qualification Requirements."

The GALL Report AMP XI.E6 states, "twenty percent of the population with a maximum sample of 25 constitutes a representative sample size. Otherwise a technical justification of the methodology and sample size used for selecting components for one-time test should be included as part of the AMP's site documentation."

The "detection of aging effects" program element of the applicant's site AMP Basis Document states the technical basis for the sample size is documented per station procedures. In addition, the site AMP Basis Document states that a representative sample size is twenty percent of the population with a maximum sample of 25 connections.

Issue:

Based on the applicant's AMP Basis Document, the applicant could select a sample size/method that is inconsistent from the GALL Report AMP XI.E6 recommendation without an evaluation by the staff.

Request:

Clarify if the sample size selection will be consistent with GALL Report AMP XI.E6 recommendation. If it is different than the GALL Report, provide a technical justification of the methodology and sample size used for selecting components.