



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

April 22, 2014

LICENSEE: Exelon Generation Company, LLC

FACILITY: Byron Station, Units 1 and 2
Braidwood Station, Units 1 and 2

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON APRIL 3, 2014, BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION AND EXELON GENERATION COMPANY, LLC CONCERNING DRAFT REQUEST FOR ADDITIONAL INFORMATION, SET 21, PERTAINING TO THE BYRON STATION AND BRAIDWOOD STATION, LICENSE RENEWAL APPLICATION (TAC NOS. MF1879, MF1880, MF1881, MF1882)

The U.S. Nuclear Regulatory Commission (NRC or the staff) and representatives of Exelon Generation Company, LLC (Exelon or the applicant), held a telephone conference call on April 3, 2014, to discuss and clarify the staff's draft request for additional information (DRAI), Set 21, concerning the Byron Station, Units 1 and 2, and the Braidwood Station, Units 1 and 2, license renewal application. The telephone conference call was useful in clarifying the intent of the staff's DRAIs.

Enclosure 1 provides a listing of the participants, and Enclosure 2 contains a listing of the DRAIs discussed with the applicant, including a brief description on the status of the items.

The applicant had an opportunity to comment on this summary.

A handwritten signature in black ink, appearing to read "Lindsay Robinson", is positioned above the typed name.

Lindsay 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

Enclosures:

1. List of Participants
2. List of Draft Request for Additional Information

cc w/encls: Listserv

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/RA/

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OFFICE	LA:DLR	PM: RPB1:DLR	BC:RPB1:DLR	PM:RPB1:DLR
NAME	IKing	LRobinson	YDiazSanabria	LRobinson
DATE	4/15/14	4/21/14	4/22/14	4/22/14

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**TELEPHONE CONFERENCE CALL
BYRON STATION, UNITS 1 AND 2, AND BRAIDWOOD STATION, UNITS 1 AND 2
LICENSE RENEWAL APPLICATION**

LIST OF PARTICIPANTS

April 3, 2014

PARTICIPANTS

AFFILIATIONS

Lindsay Robinson	U.S. Nuclear Regulatory Commission (NRC)
Jim Gavula	NRC
John Hufnagel	Exelon Generating Company, LLC (Exelon)
Don Warfel	Exelon
Al Fulvio	Exelon
Albert Piha	Exelon
Phil O'Donnell	Exelon
Casey Muggleston	Exelon
Pete Tamburro	Exelon
Patrick Lewis	Exelon
Don Brindle	Exelon
Ralph Wolen	Exelon

ENCLOSURE 1

DRAFT REQUEST FOR ADDITIONAL INFORMATION
BYRON STATION, UNITS 1 AND 2, AND BRAIDWOOD STATION, UNITS 1 AND 2,
LICENSE RENEWAL APPLICATION

April 3, 2014

The U.S. Nuclear Regulatory Commission (NRC or the staff) and representatives of Exelon Generation Company, LLC (Exelon or the applicant), held a telephone conference call on April 3, 2014, to discuss and clarify the following draft request for additional information (DRAI), Set 21, concerning the Byron Station (Byron), Units 1 and 2, and the Braidwood Station (Braidwood), Units 1 and 2, license renewal application (LRA).

DRAI B.2.1.8-1

Applicability:

Byron and Braidwood

Background:

The Generic Aging Lessons Learned (GALL) Report age management program (AMP) XI.M17, "Flow-Accelerated Corrosion," states that the program relies on implementation of the Electric Power Research Institute (EPRI) guidelines in Nuclear Safety Analysis Center (NSAC)-202L, "Recommendations for an Effective Flow Accelerated Corrosion Program." The NSAC guidelines state that the program addresses wall thinning due to flow-accelerated corrosion and does not address other thinning mechanisms. LRA Section B.2.1.8 states that the program is consistent with the GALL Report AMP XI.M17 and does not cite any enhancements or exceptions.

Several of the Byron operating experience documents indicate that the current Flow-Accelerated Corrosion (FAC) program addresses aging mechanisms other than FAC and also manages components made from stainless steel, which are exempted from the FAC program. This is shown in AR 01415234, which addresses a FAC program examination of a susceptible-not-modeled component, 1DV006-1, and notes that the wall thinning was due to droplet impingement (a non-FAC mechanism). In addition, AR 01416484 addresses a FAC program examination of a stainless steel component, 1SD319. Both aspects are inconsistent with the industry guidance for a FAC program.

Additionally, the staff noted that Exelon manages loss of material due to erosion mechanisms through its procedure ER-AA-430-1004, "Erosion in Piping and Components Guide." Although this procedure is in the same numbering sequence as Exelon's ER-AA-430, "Conduct of Flow-Accelerated Corrosion Activities," the staff could not determine which AMP uses implementing procedure ER-AA-430-1004 for managing loss of material due to erosion mechanisms.

Issue:

As currently implemented, the FAC program is inconsistent with the GALL Report because it manages wall thinning mechanisms other than FAC and manages stainless steel components that are not susceptible to FAC. It is unclear to the staff whether Exelon will change its current approach to manage these non-FAC mechanisms and components made from non-FAC

susceptible materials through an alternate AMP, or whether Exelon will change the LRA to reflect how it currently implements its FAC program.

Request:

Either modify the LRA and the associated program basis documents for the Flow-Accelerated Corrosion program to reflect the current implementation (i.e., that it manages mechanisms other than FAC and components made from stainless steel, which are not susceptible to FAC), or provide details regarding which AMP (either an enhancement to an existing program or a plant specific program) will manage loss of material due to erosion. Include information regarding which AMP(s) will credit Exelon procedure ER-AA-430-1004, "Erosion in Piping and Components Guide."

Discussion: The applicant requested clarity on the staff's concern. The applicant suggested that the first sentence of the Issue section be eliminated; but after further discussion, the staff decided to retain the Issue description as written. This question will be sent as part of the formal request titled: "RAI B.2.1.8-1."

DRAI B.2.1.8-2

Applicability:

Byron and Braidwood

Background:

The GALL Report AMP XI.M17, "Flow-Accelerated Corrosion," states that the program relies on implementation of the EPRI guidelines in NSAC-202L, "Recommendations for an Effective Flow Accelerated Corrosion Program." The GALL Report AMP XI.M17 also states that the program includes the use of a predictive code, such as CHECWORKS, to provide assurance that aging effects caused by FAC are properly managed. The NSAC guidelines state that corporate commitment is essential to an effective FAC program, which includes ensuring that appropriate quality assurance is applied. In addition, the NSAC guidelines recommend that the governing procedures include quality assurance requirements and that several portions of the program be independently checked, to include the susceptibility analysis, the predictive plant model, the selection of inspection locations, and component structural evaluations.

LRA Section B.2.1.8 states that the program is consistent with the GALL Report AMP XI.M17 and does not cite any enhancements or exceptions. The LRA also states that the program is based on NSAC-202L and that the analyses to determine critical locations are performed using the predictive code (software), CHECWORKS. The LRA further states that the FAC program is implemented as required by NRC Generic Letter (GL) 89-08, "Erosion/Corrosion Induced Pipe Wall Thinning." In its response to GL 89-08, dated July 21, 1989, Exelon states that all stations have implemented erosion/corrosion inspection programs, and that corporate guidance, which was provided to ensure a consistent approach at each site, meets or exceeds the recommendations of industry organizations such as EPRI. In addition, LRA Section A.2.1.8 states that the program activities "include analyses to determine critical locations." The staff also noted that Exelon Procedure ER-AA-430, "Conduct of Flow Accelerated Corrosion Activities," Section 4.6, "Evaluation of Inspection Data," states, "Ultrasonic inspection data should be evaluated using an approved (i.e., validated and verified) software program."

Based on discussions during the NRC's AMP Audit, Exelon categorized the CHECWORKS software as Class DD, "Screened," in accordance with IT-AA-101, "Digital Technology Software Quality Assurance (DTSQA) Procedure." According to statements in IT-AA-101, the Class DD designation applies to software whose failure to perform would have little or no risk of operational impact. The staff noted that Exelon does not categorize CHECWORKS as Class BB, "Nuclear Regulatory Related," which includes software required by either nuclear licensing or regulations or whose failure to operate as expected would have an indirect effect on nuclear plant safety. The staff noted that the DTSQA procedure includes a number of documentation requirements for Class BB software, including a validation and verification plan, whereas Class DD software requires minimal documentation and does not require or suggest validation and verification. The staff noted that, although EPRI (the developer and provider of CHECWORKS) currently validates and verifies the software, these activities are not required by Exelon's DTSQA procedure based on its current categorization.

Issue:

Although not required by GL 89-08, the industry's initial recommendations for effective FAC programs included the use of predictive software to identify locations for inspections. Exelon's response to GL 89-08 states that corporate guidance for long-term erosion-corrosion inspection programs met or exceeded the industry's recommendations. Exelon uses CHECWORKS as the predictive software to perform "analyses to determine critical locations." Although the use of CHECWORKS is not required by nuclear licensing or regulations, Exelon uses it to satisfy its current commitments to GL 89-08, and its future commitments in license renewal. Although the LRA states that a validated and verified computer program such as FAC Manager is also used in conjunction with CHECWORKS, it is not clear that validation and verification activities are programmatic requirements for any of the software used by the FAC program.

In addition, although Exelon Procedure ER-AA-430-1001, "Guidelines for Flow Accelerated Corrosion Activities," requires independent verification or independent review of several FAC activities, it is not clear that the appropriate quality assurance has been applied to all of the program aspects recommended by NSAC-202L. In particular, it is not clear whether predictive plant models have been independently checked to ensure that the susceptibility analyses provide valid results.

Request:

For software used by the FAC program (e.g., CHECWORKS and FAC Manager), provide information to demonstrate that appropriate quality assurance measures are being applied with regard to validation and verification. Specifically discuss how software discussed in Section 4.6 of Procedure ER-AA-430 (noted above) is being addressed.

For the portions of the FAC program that NSAC-202L recommends be independently checked, provide information demonstrating that implementing procedures apply appropriate quality assurance measures to these activities. Specifically discuss whether predictive plant models have been independently checked.

Discussion: The applicant requested clarity on the staff's concern. No edits were proposed. This question will be sent as part of the formal request titled: "RAI B.2.1.8-2."

DRAI B.2.1.11-1

Applicability:

Byron and Braidwood

Background:

The GALL Report AMP XI.M20, "Open-Cycle Cooling Water System," states that the program relies on implementation of the recommendations of NRC's Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety-Related Equipment." LRA Section B.2.1.11 states that the activities for this program are consistent with the site commitments to the requirements of GL 89-13. By letter dated January 29, 1990, Exelon responded to GL 89-13 and addressed Item III (with respect to establishing maintenance program activities to ensure that corrosion of piping and components cannot degrade the performance of safety-related systems supplied by service water), by stating, "Corrosion rates are continuously monitored with a corrator and with corrosion coupons of the appropriate metallurgy."

During its review of the program basis document, BB-PBD-AMP-XI.M20, "Open-Cycle Cooling Water System," the staff noted that it did not discuss monitoring corrosion rates with a corrator or with corrosion coupons, as noted in the site's response to GL 89-13. During the AMP audit at Braidwood, Exelon personnel stated that site activities are performed through the chemistry department and are consistent with its commitments to GL 89-13.

Issue:

The program basis document states that the activities for this program are consistent with the site commitments to GL 89-13. However the program basis document did not describe the maintenance activities associated with evaluating corrosion rates using corrosion coupons, even though the sites are apparently performing these maintenance activities consistent with the site's commitments to GL 89-13.

Request:

Reconcile the apparent discrepancy between the program activities being performed by the sites relating to the monitoring of corrosion rates, and the program activities described in the Open-Cycle Cooling Water System program basis document.

Discussion: The applicant requested clarity on the staff's concern. No edits were proposed. This question will be sent as part of the formal request titled: "RAI B.2.1.11-1."