Clinton Power Station
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Clinton, IL 61727

Exelon Generation.

U-604391

December 21, 2017

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
2443 Warrenville Road, Suite 210
Lisle, IL 60532

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Appeal of Final Significance Determination of a White Finding; EA-17-098

References:

1. Letter from Patrick L. Louden (NRC) to Bryan C. Hanson (EGC), "Clinton Power Station – NRC Inspection Report 05000461/2017009 and Preliminary White Finding [EA-17-098]," dated August 14, 2017 (ADAMS Accession No. ML17226A321)

2. Letter from Theodore R. Stoner (EGC) to NRC Document Control Desk (DCD), "Notification of Intention Regarding Inspection Report 05000461/2017009 and Preliminary White Finding (EA-17-098)," dated August 23, 2017 (ADAMS Accession No. ML17235B156)

3. Letter from Theodore R. Stoner (EGC) to NRC DCD, "Response to Nuclear Regulatory Commission Inspection Report 05000461/2017009 and Preliminary White Finding, EA-17-098," dated September 18, 2017 (ADAMS Accession No. ML17263A124)

4. Letter from Cynthia D. Pederson (NRC) to Bryan C. Hanson (EGC), "Clinton Power Station – Final Significance Determination of a White Finding with Assessment Followup and Notice of Violation; NRC Inspection Report No. 05000461/2017010 [EA-17-098]," dated November 27, 2017 (ADAMS Accession No. ML17331B161)

On August 14, 2017, the NRC issued Inspection Report 05000461/2017009 to Exelon Generation Company, LLC (EGC) (Reference 1). The Inspection Report identified a preliminary finding defined as an Apparent Violation (AV) of 10 CFR 50, Appendix B, Criterion III, "Design Control." The AV was classified as self-revealing, low to moderate safety significance (White). The AV is related to the failure to evaluate the change in the actual drop-out relay voltages for the Division 1 Emergency Diesel Generator (EDG) room ventilation fan resulting in the EDG being declared inoperable.

The Inspection Report provided EGC the option to attend a Regulatory Conference or submit EGC's position on the finding, in writing, within 40 days of the date of Reference 1. Additionally, the letter required a ten-day response to notify the NRC of the intended response.

On August 23, 2017, EGC submitted the required ten-day response to notify the NRC that a 40-day written response would be submitted to provide EGC's position on the finding (Reference 2).

On September 18, 2017, EGC submitted its 40-day written response (Reference 3). This response documented the EGC position concerning the significance of AV EA-17-098. The response provided a description and conclusion of the additional analysis performed to evaluate the survivability of equipment in the Division 1 EDG room following a postulated failure of EDG ventilation fan 1VD01CA. EGC acknowledged that a performance deficiency had occurred and did not dispute the AV or the assigned cross-cutting aspect. However, based on the information provided in the 40-day written response, EGC reassessed the safety significance and concluded that the finding has very low safety significance (Green).

Subsequently, on November 27, 2017, the NRC issued Inspection Report 05000461/2017010 to EGC (Reference 4). The Inspection Report stated that, after consideration of information provided in EGC's 40-day written response, the NRC had concluded the finding described in Reference 1 was appropriately characterized as White, a finding of low to moderate safety significance.

Inspection Report 05000461/2017010 stated that EGC had 30 calendar days from the date of the letter to appeal the determination of significance for the identified White finding. EGC has performed a thorough review of the NRC's assessment and considered both the prerequisites and the limitations as described in NRC Inspection Manual Chapter (IMC) 0609, Attachment 2, "Process for Appealing NRC Characterization of Inspection Findings ([Significance Determination Process] (SDP) Appeal Process)." After carefully considering the available information, EGC appeals the NRC's final significance determination of the White finding documented in Inspection Report 05000461/2017010 (Reference 4). The enclosure to this letter provides EGC's appeal of the significance of the finding.

EGC asserts that the basis documented in Reference 4 to determine the acceptability of Reference 3 appears to be qualitative in nature, subjective, and based on an undefined alternative process. As a result, the NRC's final significance determination deviates from established NRC regulations and guidance currently used for safety-related equipment qualification. Therefore, this appeal meets the "lacked justification" merit standard provided in NRC Inspection Manual Chapter 0609, Attachment 2.

The test sample size supporting the evaluation used in the EGC 40-day written response (Reference 3) was determined in accordance with the CPS licensing basis and standard industry practices. The evaluation is based on quantitative, NRC-endorsed methods and provides reasonable assurance that the EDG would have met its PRA mission time.

Based on information provided in the enclosure, EGC maintains the finding appropriately should be characterized as having very low safety significance (i.e., Green) for the following reasons:

- The NRC's letter (Reference 4) did not credit EGC's component test results, because the NRC maintains that the test sample size did not represent a statistically significant sample or represent a substantive basis to reliably establish equipment survivability limits.

- This NRC action was based on an undefined regulatory requirement and ignores precedent for how this type of testing typically has been conducted.

- EGC's sample size was reasonably selected based on regulatory guidance available for establishing equipment qualification limits for electrical components. The NRC has not articulated any standard or practice that invalidates EGC's approach in this instance.

- The EGC approach is consistent with the approach that a licensee would use to first qualify a component pursuant to 10 CFR 50.49 and therefore, is reasonable under this circumstance for demonstrating the survivability of the component.

EGC appreciates the NRC's consideration of the issues raised in this appeal in accordance with established processes. Should the NRC have questions regarding the appeal, we remain available to continue our dialogue to achieve a common understanding of the facts and significance of this finding. We look forward to reviewing the results of NRC's assessment of the issues raised in this appeal.

There are no regulatory commitments contained in this letter. If you have any questions, please contact Mr. Dale A. Shelton, Regulatory Assurance Manager, at (217) 937-2800.

Respectfully,

Theodore R. Stoner
Site Vice President
Clinton Power Station

Enclosure: Exelon Generation Company, LLC, Appeal of the Significance of Apparent Violation EA-17-098

cc: Ms. Laura Kozak, Acting Chief, Branch 1, Division of Reactor Projects - NRC Region III
NRC Project Manager, NRR - Clinton Power Station
NRC Senior Resident Inspector- Clinton Power Station
US NRC Document Control Desk

Enclosure

Exelon Generation Company, LLC
Appeal of the Significance of
Apparent Violation EA-17-098

Enclosure

Exelon Generation Company, LLC
Appeal of the Significance of Apparent Violation EA-17-098

Violation:

On November 27, 2017, the NRC issued Inspection Report 05000461/2017010 to Exelon Generation Company, LLC (EGC). The Inspection Report stated that, after consideration of information provided in EGC's 40-day written response, the NRC had concluded the finding for the Clinton Power Station (CPS) Division 1 Emergency Diesel Generator (EDG) being inoperable for greater than the Technical Specification (TS) allowed outage time was appropriately characterized as White, a finding of low to moderate safety significance. The Inspection Report further stated that EGC had 30 calendar days from the date of the letter to appeal the determination of significance for the identified White finding. This document provides EGC's appeal of the significance of the finding.

Background:

Inspection Report 05000461/2017010 states:

> *Although the licensee provided test data, we judged that the test sample size, most frequently one test per component for those that were tested, did not represent a statistically significant sample or represent a substantive basis to reliably establish equipment survivability limits.*
>
> *With respect to component evaluations, we relied on component information / details contained within the previously discussed EC's and IP-Q-0396a [IP-Q-0396, Revision 1], "Operability Evaluation of Equipment at Elevated Temperature in Diesel Generating Room," which is part of the current licensing basis. The IP-Q-0396a [IP-Q-0396, Revision 1] previously evaluated the qualification of the components for operation at elevated temperatures (room temperature excursions to 140 degrees F for 12 hours).*

NRC Inspection Procedure 0609, Attachment 2, provides the following criterion for consideration of an appeal:

> *The staff's significance determination process was inconsistent with the applicable SDP guidance or lacked justification. Issues involving the staff's choice of probabilistic risk modeling assumptions used in the SDP will not be considered appealable under this process, provided the staff documented its justification in those cases where the licensee presented a different point of view.* [emphasis added]

The NRC Final Significance Determination Letter (Reference A), makes the following statements:

> *" . . . we judged that the test sample size, most frequently one test per component for those that were tested, did not represent a statistically significant sample or represent a substantive basis to reliably establish equipment survivability limits."*
>
> And

> *"In our judgement, the significant departure (i.e., greater than 10%) from qualified temperatures was not justified by the limited testing and did not provide reasonable assurance that margin existed between the room temperature and equipment survivability limits."*

EGC asserts that the basis documented in Reference A to determine the acceptability of Reference B appears to be subjective and not based on any required or defined alternative process. The NRC cannot create an acceptance standard in the middle of an enforcement proceeding, which it previously had not provided to EGC, and additionally invalidate a test approach it previously has accepted for similar purposes. As a result, the NRC's final significance determination deviates from established NRC regulations and guidance currently used for safety-related equipment qualification. Therefore, this appeal meets the "lacked justification" merit standard provided in NRC Inspection Manual Chapter 0609, Attachment 2.

The test sample size supporting the evaluation used in the EGC 40-day written response (Reference B) was determined in accordance with the CPS licensing basis and standard industry practices in accordance with 10 CFR 50.49, "Environmental qualification of electric equipment important to safety for nuclear power plants," NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," and IEEE 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations," as described below. The evaluation used quantitative, NRC-endorsed methods that provide reasonable assurance the EDG would have met its mission time.

Licensing Basis:

NRC Regulation 10 CFR 50.49(a) states:

> *Each holder of or an applicant for an operating license issued under this part . . . shall establish a program for qualifying the electric equipment defined in paragraph (b) of this section.*

Paragraph (b) of 10 CFR 50.49 defines that the regulation is applicable to safety-related equipment that is relied upon to remain functional during and following design basis events.

Paragraph (f) of 10 CFR 50.49 further states:

> *Each item of electric equipment important to safety must be qualified by one of the following methods:*
>
> *(1) Testing an identical item of equipment under identical conditions or under similar conditions with a supporting analysis to show that the equipment to be qualified is acceptable.*
>
> *(2) Testing a similar item of equipment with a supporting analysis to show that the equipment to be qualified is acceptable.*
>
> *(3) Experience with identical or similar equipment under similar conditions with a supporting analysis to show that the equipment to be qualified is acceptable.*

> *(4) Analysis in combination with partial type test data that supports the analytical assumptions and conclusions.*

The regulation does not contain any requirements for performing testing of a significant sample of equipment but instead applies margins to the testing environment to account for unquantified uncertainty, such as the effects of production variations and inaccuracies in test instruments in 10 CFR 50.49(e) as follows:

> *(1) Temperature and pressure. The time-dependent temperature and pressure at the location of the electric equipment important to safety must be established for the most severe design basis accident during or following which this equipment is required to remain functional.*
>
> . . .
>
> *(8) Margins. Margins must be applied to account for unquantified uncertainty, such as the effects of production variations and inaccuracies in test instruments. These margins are in addition to any conservatisms applied during the derivation of local environmental conditions of the equipment unless these conservatisms can be quantified and shown to contain appropriate margins.*

The regulation provides additional clarifications for applicants and holders of operating licenses in 10 CFR 50.49(k) as follows:

> *Applicants for and holders of operating licenses are not required to requalify electric equipment important to safety in accordance with the provisions of this section if the Commission has previously required qualification of that equipment in accordance with "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors," November 1979 (DOR Guidelines), or NUREG-0588 (For Comment version), "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment."*

CPS was licensed in accordance with NUREG-0588 as allowed by 10 CFR 50.49(k) and documented in CPS Updated Safety Analysis Report (USAR) Section 3.11.1 as follows:

> *3.11.1 Introduction*
>
> *Environmental equipment qualification efforts for the Clinton Power Station Unit 1 began with the issuance of original equipment procurement specifications. These documents contained requirements to ensure General Design Criteria (10 CFR 50 Appendix A) 1, 2, 4, and 23 were satisfied and included IEEE 323 and 344.*
>
> *Since the issuance of IE Bulletin 79-01B, NUREG-0588 ([USAR] Reference 2) and the Commission Memorandum and Order (CLI-80-21) of May 23, 1980 ([USAR] Reference 1), an effort was initiated to compare the Clinton*

> *Environmental Qualification (CEQ) program against the requirements as stated in these documents. This included recalculation or verification of environmental parameters (radiation, temperature, pressure, humidity) to ensure consistency with guidelines contained in NUREG-0588, Rev. 1, Category 1 requirements.*

CPS is committed to IEEE 323-1974.

NUREG-0588 does not require testing a statistical sample and recognizes that a small number of units may be tested (Reference Section 2.4.3(3)). NUREG-0588 endorses IEEE 323 for equipment qualification and provides additional guidance, as applicable. In addition, NRC Regulatory Guide 1.89, "Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants," Revision 1, endorses IEEE 323-1974 as an acceptable method for satisfying the NRC's regulations pertaining to the qualification of electric equipment for service in nuclear power plants to ensure that the equipment can perform its safety functions. As a result, Equipment Qualification for safety related (IEEE Class 1E) equipment throughout the industry was based on testing a very limited sample size. Although these 1E components were designed and built to be rugged and robust, the qualification for the environment was and is often demonstrated by testing a single component type.

IEEE Standard 323 states:

> *Qualification may be accomplished in several ways: type testing, operating experience, or analysis. These may be used individually or in any combination depending upon the particular situation.*

The IEEE standard does not require a statistical sample and defines type testing as a minimum of one as follows:

> *Type tests. Tests made on one or more sample equipment's to verify adequacy of design and the manufacturing processes.*

The standard does require that margin be applied to type testing as follows:

> *6.3.1.5 Margin. Margin is the difference between the most severe specified service conditions of the plant and the conditions used in type testing to* ***account for normal variations in commercial production of equipment and reasonable errors in defining satisfactory performance****. The qualification type testing shall include provisions to verify that adequate margin exists. In defining the type test, increasing levels of testing, number of test cycles, and test duration shall be considered as methods of assuring adequate margin does exist. Suggested factors to be applied to service conditions for type testing are as follows:*

> *(l) Temperature: + 15 °F (8 °C)...*

Discussion:

The approach CPS took to evaluate the equipment under the higher temperature environment was analogous to the approach used to qualify these same components for the typical operating conditions. The EDGs were originally designed for an operating environment of 122 °F. Much of the equipment that was installed on the EDGs was robust but was not originally designed to be operated at the extreme temperatures such as those indicated in IP-Q-0396, Revision 1, (Reference C) (*room temperature excursions to 140 °F for 12 hours*). It was quite common during construction, prior to plant operation, for the environmental conditions of a given area to change due to industry experience or due to changes in NRC requirements (e.g., NUREG-0588). The approach used and accepted by the NRC during this time frame was to qualify the safety related equipment in accordance with the licensing basis, in this case NUREG-0588. This approach was used by CPS in response to Information Notice 89-30, Supplement 1, "High Temperature Environments at Nuclear Power Plants," as documented in IP-Q-0396, Revision 1 (Reference C). The approach was to test and evaluate components that did not meet the new requirements in accordance with NUREG-0588 and IEEE 323 as applicable. It should be noted that the NRC indicated in their response (Reference A) that:

> *With respect to component evaluations, we relied on component information/details contained within the previously discussed EC's and IP-Q-0396a [IP-Q-0396, Revision 1], "Operability Evaluation of Equipment at Elevated Temperature in Diesel Generating Room," which is part of the current licensing basis.*

This equipment testing did not need to include multiple samples to establish a statistical result. If the test component failed, CPS also would have had to accept that non-statistical test result. However, the tested components did not fail at test temperatures that were significantly above the expected area temperatures. This approach is consistent with industry practices for Class 1E equipment and with the approach used in existing CPS analysis referenced by the NRC (i.e., IP-Q-0396, Revision 1 (Reference C)). The logic for this established industry approach is that the subject equipment that is installed on the machine is substantially the same as those purchased for replacement because it is provided from vendors who have an Appendix B, QA program. As indicated in IEEE 323:

> *The manufacturers and users of Class 1E equipment are required to provide assurance that such equipment will meet or exceed its performance requirements throughout its installed life. This is accomplished through a disciplined program of quality assurance that includes but is not limited to design, qualification, production quality control, installation, maintenance, and periodic testing.*

Recognizing that there would be small variations in components even under these tight controls the IEEE 323 standard, in lieu of testing large samples, requires that, *"Margins must be applied to account for unquantified uncertainty, such as the effects of production variations and inaccuracies in test instruments."* The standard provides suggested margins for temperature testing of 15 °F and time of 10%, which support the requirements in 10 CFR 50.49. The type testing performed by CPS in Reference B satisfied these margins as required by the standard.

Conclusion:

The EGC evaluation of the critical components to support the EDG mission time provided in the EGC 40-day written response (Reference B) was performed in accordance with the CPS licensing basis and standard industry practices in accordance with 10 CFR 50.49, NUREG-0588 and IEEE 323 and was analogous to the testing and analysis performed for similar IEEE equipment qualified at CPS as documented in the current design basis (i.e., IP-Q-0396, Revision 1 (Reference C)).

Therefore, after carefully considering the available information, and the prerequisites and the limitations as described in NRC Inspection Manual Chapter (IMC) 0609, EGC appeals the NRC's characterization of the finding documented in Inspection Report 05000461/2017010 as White and maintains that the finding is more appropriately characterized as having very low safety significance (i.e., Green) based on the analyses provided in the EGC 40-day written response (Reference B).

References:

(A) Letter from Cynthia D. Pederson (NRC) to Bryan C. Hanson (EGC), "Clinton Power Station – Final Significance Determination of a White Finding with Assessment Followup and Notice of Violation; NRC Inspection Report No. 05000461/2017010 [EA-17-098]," dated November 27, 2017 (ADAMS Accession No. ML17331B161)

(B) Letter from Theodore R. Stoner (EGC) to NRC, "Response to Nuclear Regulatory Commission Inspection Report 05000461/2017009 and Preliminary White Finding, EA-17-098," dated September 18, 2017 (ADAMS Accession No. ML17263A124)

(C) IP-Q-0396, Revision 1, "Operability Evaluation of Equipment at Elevated Temperature in the Diesel Generator Room"