



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
LISLE, ILLINOIS 60532-4352

February 8, 2018

EA-17-098

Mr. Bryan C. Hanson  
Senior VP, Exelon Generation Company, LLC  
President and CNO, Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: NRC DENIAL OF EXELON GENERATION COMPANY, LLC, APPEAL OF  
CLINTON POWER STATION—FINAL SIGNIFICANCE DETERMINATION  
OF A WHITE FINDING; NRC INSPECTION REPORT 05000461/2018090

Dear Mr. Hanson:

On November 27, 2017, the U.S. Nuclear Regulatory Commission (NRC) provided Exelon Generation Company, LLC, (EGC), the final significance determination for a finding of low-to-moderate significance (White) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17331B161). This finding involved the failure to evaluate the change in the actual drop out voltages for replacement relays associated with the Division 1 Emergency Diesel Generator (EDG) room ventilation fan, which was a component subject to the requirements of Title 10 of the Code of Federal Regulations (CFR) Part 50, Appendix B. The change in drop out voltages prevented the fan from operating during an undervoltage condition, resulting in the Division 1 EDG being unable to perform its intended safety function and becoming inoperable for a time longer than its Technical Specification allowed outage time.

In that same letter, the NRC stated that Exelon had 30 calendar days to appeal the NRC's final significance determination. The letter also stated that such an appeal would be considered to have merit only if it met the criteria given in Inspection Manual Chapter (IMC) 0609, Attachment 2, "Process for Appealing NRC Characterization of Inspection Findings (SDP Appeal Process)" (ADAMS Accession No. ML101400502).

By letter dated December 21, 2017, Exelon reiterated that a performance deficiency had occurred and did not dispute the violation or the assigned cross-cutting aspect (ADAMS Accession No. ML17355A562). However, Exelon appealed the NRC's characterization of the final significance determination of the White finding. Exelon asserted that the basis documented in the final significance determination letter appeared to be qualitative in nature, subjective, and based on an undefined alternative process. As a result, the NRC's final significance determination deviated from established NRC regulations and guidance currently used for safety-related equipment qualification. Therefore, Exelon stated that its appeal met the "lacked justification" merit standard provided in NRC IMC 0609, Attachment 2.

This letter provides you the NRC's response to your December 21, 2017, appeal. The NRC concluded that Exelon's appeal did not have sufficient merit for review by the appeal process specified in IMC 0609 Attachment 2. Our evaluation of the appeal submitted by Exelon is provided in the enclosure to this letter.

Accordingly, the NRC concluded that the final significance determination documented in NRC Inspection Report 05000461/2017010, is unchanged and, based on your previous response to the Notice of Violation, no further response is required. If you have any questions on our conclusions on the merit of your appeal, please contact Mr. Patrick Loudon, Director, Division of Reactor Projects, at 630-829-9600, or Ms. Karla Stoedter, Chief, Reactor Projects Branch 1, at 630-829-9731.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room and in ADAMS, accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,

*/RA/*

K. Steven West  
Regional Administrator

Docket No. 50-461  
License No. NPF-62

Enclosure:  
NRC Response to Final Significance  
Determination Appeal

Letter to Bryan Hanson from K. Steven West dated February 8, 2018

SUBJECT: NRC DENIAL OF EXELON GENERATION COMPANY, LLC, APPEAL OF CLINTON POWER STATION—FINAL SIGNIFICANCE DETERMINATION OF A WHITE FINDING; NRC INSPECTION REPORT 05000461/2018090

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ADAMS Accession Number: ML18039A728

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**NRC RESPONSE TO FINAL SIGNIFICANCE DETERMINATION APPEAL  
(EXELON LETTER U-604391 DATED DECEMBER 21, 2017)**

On December 21, 2017, Exelon submitted an appeal (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17355A562) of the NRC staff's final significance determination (FSD) associated with NRC Inspection Report 05000461/2017010, "Clinton Power Station - Final Significance Determination of a White Finding with Assessment Followup and Notice of Violation," dated November 27, 2017 (ADAMS Accession No. ML173318161).

The NRC determined that for the finding documented in NRC Inspection Report 05000461/ 2017010, the prerequisites specified in Inspection Manual Chapter (IMC) 0609, Attachment 2, "Process for Appealing NRC Characterization of Inspection Findings (SDP Appeal Process)", dated June 8, 2011, Section 0609.02-02, were met. Accordingly, the NRC reviewed the licensee's contentions to determine if they met one or more of the appealable categories specified in IMC 0609.02-03. The following provides the results of the NRC's evaluation of the licensee's appeal.

**Licensee Appeal:**

Exelon Generation Company (EGC) asserts that the basis documented by the NRC in the final significance determination to determine the acceptability of the licensee's response to the NRC's preliminary significance determination 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.

**NRC Response:**

The NRC's final significance determination is based on a quantitative evaluation estimating a change in core damage frequency in accordance with IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power" and IMC 0308, Attachment 3, "Significance Determination Process Technical Basis." An important probabilistic modeling assumption used in our independent significance determination is that room cooling is required for diesel generator success. In reaching a final significance determination, this assumption is based on the current Clinton Probabilistic Risk Assessment (PRA) model and our consideration of the information provided in the EGC evaluation. The degraded condition assessed under the SDP, a room ventilation fan failure, would expose critical diesel generator electrical components to extreme room temperatures. EGC pursued component testing to demonstrate survivability of the components. The NRC inspection staff reviewed EGC's test results and concluded that the test data did not provide a substantive basis to reliably establish equipment survivability limits. Accordingly, the NRC reaffirmed an assumption that room cooling is required for diesel generator operation and estimated a change in risk for a degraded condition involving the diesel generator room ventilation fan failure. Therefore, the NRC contends that notwithstanding EGC's position, the NRC's assumptions are not qualitative, subjective or based on an undefined alternative process.

The NRC's criteria for determining if an appeal has merit for review by the appeal process under the "lacked justification" standard also states that the staff's choice of PRA modeling assumptions used in the SDP will not be considered appealable, provided the staff

documented its justification in those cases where the licensee presented a different point of view. The PRA modeling assumption that room cooling is required for diesel generator success was documented in our inspection report with our preliminary significance determination and remained unchanged in the final significance determination. The NRC's consideration of EGC's evaluation, which was provided prior to the final significance determination, resulted in credit in the risk evaluation for operator action to recover room cooling if the ventilation fan failed and for additional time to restore offsite power because the diesel generator is not expected to fail immediately upon room cooling failure. The NRC considered but did not agree with EGC's conclusion that room cooling was not needed for diesel generator operation and that no change in risk occurs due to a room ventilation fan failure. The NRC's justification for the SDP assumptions and for the disagreement with EGC's conclusion was documented in the final significance determination letter. Therefore, the NRC determined that the appeal did not meet the merit guidelines since PRA modeling assumptions were appropriately and clearly documented with justification in the preliminary and final significance determination letters.

The EGC contends that the component testing was conducted in conformance with their licensing basis with respect to component qualification standards and therefore, the methodology and single component testing is technically sufficient to demonstrate equipment survivability. Specifically, the licensee contends that the testing conducted conforms to IEEE-323, "IEEE Standard for Qualifying Class IE Equipment for Nuclear Power Generating Stations," which provides for component type testing to qualify equipment. The NRC agrees that IEEE-323 is an acceptable method to qualify components subject to environmental qualification requirements. As the requirements of 10 Code of Federal Regulations (CFR) 50.49 do not apply to these components and the licensee had not previously stated the intent to demonstrate a capability via application of the standards associated with 10 CFR 50.49, the NRC did not document our conclusions on the adequacy of testing in comparison to this standard. We note EGC's contention that the testing conformed to this standard or any other standard had not been communicated to the inspection staff through the inspection and significance determination process, up to and including EGC's submittal on September 18, 2017.

The NRC staff reviewed EGC's test results and IEEE-323 and concluded that invocation of type testing as described within IEEE-323 would require conformance with all elements described within IEEE-323, or an appropriate justification for a deviation. The evaluation provided by EGC does not discuss or otherwise indicate that the information provided aligned with type testing requirements (e.g., testing performed on components selected did not align with portions of Section 5.1 "Type Testing," and Section 6.3 "Type Test Procedures") nor was any deviation discussed. The NRC conclusion on the acceptability of the testing was not based on full qualification of the components pursuant to IEEE-323 requirements. Because the equipment in the room was not originally qualified to the temperatures that would exist without room cooling, and the evaluation and testing provided did not meet IEEE-323 requirements, there is no pre-existing standard for judging the adequacy of EGC's testing.

Notwithstanding, the NRC did not make a final determination on whether the testing met IEEE-323 standards, as meeting such a standard is not required within the SDP. In the final determination letter, the NRC stated that EGC's testing did not represent a statistically significant sample or represent a substantive basis to reliably establish equipment survivability limits. Since the EGC response to the preliminary significance determination letter did not provide any standard used in the performance of the testing, the NRC staff considered general industry and engineering standards in reviewing the evaluation to determine if the assumptions used in the SDP evaluation should be modified. However, the staff could not

correlate the provided test to any standard given the limited information provided by the single test. Therefore, as stated above, a single test was deemed insufficient because the components in question were not already designed to significantly higher temperatures, thereby demonstrating reliable component performance under extreme operating temperatures.

Any evaluation to demonstrate equipment will function reliably outside its design specifications is subject to uncertainty. The NRC acknowledged this uncertainty during the consideration of the EGC evaluation in support of our final significance determination. It is possible the equipment could successfully and reliably operate at much higher temperatures but a sufficient technical basis was not provided to draw that conclusion. To consider and account for the uncertainty, the NRC performed a sensitivity evaluation, using a different modeling approach which considered the degraded condition to be an increase in diesel generator failure rate rather than a diesel generator failure caused by a room cooling failure. A modest increase in the failure rate also would result in a finding of White significance. Accordingly, consideration of the uncertainty provided confidence in the PRA assumptions and in our conclusion on the significance of the inspection finding.