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U.S. Nuclear Regulatory Commission Washington, DC 20555 ATTN: Document Control Desk

Subject: **R.E. Ginna Nuclear Power Plant** Renewed Facility Operating License No. DPR-18 NRC Docket No. 50-244

Reply to Notice of Violation 05000244/2019010-02

R. E. Ginna Nuclear Power Plant - Design Bases Assurance Inspection Reference 1: (Teams) Report 05000244/2019010 and Notice of Violation

Exelon Generation Company, LLC (EGC) is respectfully contesting the Notice of Violation (NOV) contained in Reference 1. The Green NOV (NOV 05000244/2019010-02) cites a violation of Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Appendix B, Criterion III, "Design Control," (requiring, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis, as defined by 10 CFR 50.2 and as specified in the license application, are correctly translated into specifications, drawings, procedures, and instructions). The NOV states that the violation is due to a failure, since 1969, to design or ensure that in the event of a design-basis earthquake, the safety related Emergency Diesel Generator (EDG) Motor Control Centers (MCCs) H and J would not be lost due to an electrical circuit fault in the non-safety related sump pump motor. The NOV concludes that EGC's failure to assure that the design requirements to prevent the loss of MCC H and J due to a seismic event were in place was a performance deficiency and reasonably within EGC's ability to foresee and prevent. EGC maintains that the R.E. Ginna Nuclear Power Plant (Ginna) meets the NRC's standards in effect at the time of its construction (begun in 1966) as well as those in effect at the time of Application for Full-Term Operating License (1972). As such, EGC views that the NOV is unwarranted and should be rescinded. In addition, EGC believes that the position reflected in the Inspection Report constitutes a backfit and asks that the NRC assess these concerns consistent with agency backfitting processes.

There are no regulatory commitments contained in this letter.

Respectfully,

Paul M. Swift

Site Vice President

Attachment:

- 1. Detailed Reply to Notice of Violation 05000244/2019010-02
- cc: Director, Office of Enforcement Regional Administrator, Region 1 NRC Resident Inspector

IEOI RGN-T

Attachment 1

Detailed Reply to Notice of Violation 05000244/2019010-02

Reference 1 documents a finding of very low safety significance (green) and associated violation of 10 CFR Part 50, Appendix B, for failure to ensure that the maximum potential earthquake will not cause a loss of safety related Emergency Diesel Generator (EDG) motor control centers (MCCs) H and J which will impair the ability of the EDGs to perform their intended safety function. The NOV states:

"Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis, as defined by 10 CFR 50.2 and as specified in the license application, are correctly translated into specifications, drawings, procedures, and instructions.

The Atomic Industrial Forum (AIF), General Design Criteria (GDC) 2, AIF-GDC 2, and UFSAR 3.1.1.1.2, Performance Standards, require that those systems and components of reactor facilities which are essential to the prevention or the mitigation of the consequences of nuclear accidents which could cause undue risk to the health and safety of the public, shall be designed, fabricated, and erected to performance standards that enable such systems and components to withstand, without undue risk to the health and safety of the public, the forces that might reasonably be imposed by the occurrence of an extraordinary natural phenomenon such as an earthquake.

UFSAR Section 8.1.4.1, Performance Standards, describes the electrical system and the emergency diesel generators compliance with AIF-GDC 2 stating, "All electrical systems and components vital to plant safety, including the emergency diesel generators (EDG), are designed as Seismic Category I and designed so that their integrity is not impaired by the maximum potential earthquake."

UFSAR 1.8.3.2, Class 1E Electric Systems for Nuclear Power Generating Station (IEEE 308 -1971), Section 1.8.3.2.1, Principal Design Criteria, states that Class 1E electrical systems shall be designed to ensure that any design-basis event will not cause a loss of electric power to a number of engineered safety features, surveillance devices, or protection system devices sufficient to jeopardize the safety of the station. It also states that all electrical systems and components vital to plant safety, including the emergency diesel generators, are designed as Class 1E and are designed so that their integrity is not impaired by the design-basis earthquake, wind storms, floods, or disturbances on the external electrical system.

Contrary to the above, since 1969, after the non-safety related EDG building vault sump pumps were installed, the licensee did not ensure that the maximum potential earthquake will not cause a loss of safety related EDG motor control centers (MCCs) H and J which will impair the ability of the EDGs to perform their intended safety function. Specifically, the licensee did not design or ensure that in the event of a design-basis earthquake, the safety related EDG MCCs H and J would not be lost due to an electrical circuit fault in the non-safety related sump pump motor.

This violation is associated with a Green Significance Determination Process finding."

With this letter, EGC is contesting this NOV.

(1) Basis for Contesting the Violation

In the Notice of Violation, the NRC inspection team identified a Cited Violation of 10 CFR part 50, Appendix B, Criterion III, "Design Control" on the basis that Motor Control Center H and J are not designed to isolate an electrical circuit fault in the non-safety related sump pump motor. EGC agrees that a lack of circuit breaker coordination exists but had previously analyzed the condition. The design and construction of the motor control centers was completed in 1969, prior to the publication of IEEE standards, Regulatory Guides, and codification of the General Design Criteria in Appendix A to 10 CFR part 50. EGC performed a review of standards in effect in 1972 and concluded that the site conforms to the codes and standards in effect, as listed in the Technical Supplement Accompanying Application for a Full-Term Operating License, dated August 1972.

EGC believes that the conclusions of the NRC inspection team rely upon the application of versions of codes and standards that were not in effect at the time of Ginna's initial licensing. Those codes and standards were revised and clarified following the licensing of the plant but were never expressly made applicable to Ginna. As such, the position reflected in the Notice of Violation represents a change in the staff's position and would result in a change in Ginna's licensing basis. Application of later revisions to those codes, standards and guidance by the NRC is subject to the constraints of the backfit rule at 10 CFR 50.109 and recent direction by the Commission in the issuance of Management Direction 8.4, "Management of Backfitting, Forward Fitting, Issue Finality, and Information Requests."

IEEE 308-1971 is the IEEE Standard Criteria for Class 1E Electric Systems for Nuclear Power Generating Stations. Ginna committed to the 1971 standard in the Application for Full-Term Operating License in 1972. This standard was revised in 1974 and again in 1978 and makes clear that IEEE 308-1971 should not be interpreted as the staff has done in the Notice of Violation. In the forward to the 1978 revision, for instance, it states that one of the reasons why the revision was undertaken was to address a number of areas where additional guidance was needed, including item (3) Connection of non-Class 1E loads to Class 1E buses and item (4) Independence of Class 1E power systems. There are several important differences between IEEE 308-1971 and IEEE 308-1978 that help to understand the evolution of standards over time. (*See next section.*)

Recognition and Treatment of Non-Class 1E Loads

In addition to recognition of Non-Class 1E loads in the forward of the IEEE 308-1978 standard, Section 5.10 was added for "Connection of Non-Class 1E Circuits." The section recognizes that non-Class 1E loads may be supplied from Class 1E systems, provided that Class 1E systems are not degraded below an acceptable level. This section requires that non-Class 1E circuits meet the independence requirements of IEEE 384-1977. This section did not exist in the IEEE 308-1971 version, nor was there similar guidance provided.

According to the forward, the 1977 revision of IEEE 384 "reflects an expansion in scope responsive to various expressed needs to address ... areas of concern," including "isolation characteristics" and "isolation devices; types and application criteria."

- Section 4.6 was added to this standard to reflect guidance for non-Class 1E circuits.
- Section 6 was added for "Specific Electrical Isolation Criteria."
 - Section 6.1.1 establishes the general criteria for electrical isolation of non-Class 1E from Class 1E circuits.
 - Section 6.1.2.1 describes the criteria for Circuit Breakers to trip on a fault.

Prior to 1977, IEEE 384 only described separation criteria, not isolation criteria.

Generic Letter 89-18 contains specific highlighted concerns with respect to Electric Power Systems and adverse interactions between safety related and non-safety related portions of power supplies due to inadequate isolation. Generic Letter 89-18 recognized that in the case of older plants, causes of adverse system interactions often are related to the fact that less design guidance and associated analyses were available and/or required when the plants were licensed. This is presented separately from 1) those failures from obvious errors or 2) failures to meet clearly-specified design requirements. Generic Letter 89-18 also acknowledged that total elimination of adverse systems interactions was not achievable and stated that the staff did not recommend that "each plant undertake a large, comprehensive study to uncover [adverse system interactions]." The staff recognized the continuing importance of ongoing activities such as probabilistic risk assessments or other systematic plant evaluations in addressing these issues. Ginna was one of the sites within the Systematic Evaluation Program (SEP) and participated in a multi-year effort to identify and resolve risk-significant issues arising from a review against updated standards.

Systematic Evaluation Program (SEP) and Unresolved Safety Issue A-46

In the SEP program, when deviations from current licensing approaches were identified, several alternatives (or combinations of alternatives) were considered as a basis for establishing acceptability:

- 1) The deviation can be justified as not significantly decreasing the level of safety, i.e., the probability and consequences of events are sufficiently low.
- 2) Use of non-safety systems to perform safety functions.
- 3) Administrative or procedural changes to enhance system reliability.
- 4) Augmented surveillance programs.
- 5) Selected backfitting to enhance system reliability.

The SEP also established that favorable operating experience would be considered in assessing deviations from current criteria where appropriate.

Key SEP Topic reviews related to the diesel generator were:

- SEP Topic III-1, Classification of Structures, Systems, and Components (SSCs) (seismic and quality),
- Topic III-6, Seismic Design Considerations, and
- Topic VIII-2, Onsite Emergency Power System, specifically the diesel generators.

What was not reviewed under SEP was the seismic qualification of other equipment. As discussed in the Safety Evaluation Report, "SEP Safety Topics III-6, Seismic Design Consideration, and III-II, Component Integrity - Ginna Nuclear Power Plant," dated January 29, 1982, page 7, the site-specific ground response spectra were not available at the time the NRC SEP review started in mid-1979. Additionally, the NRC staff initiated a generic program to develop criteria for the seismic qualification of equipment under Unresolved Safety Issues (USI A-46, "Seismic Qualification of Equipment in Operating Plants") that was intended to set explicit criteria that would be used to judge the adequacy of the seismic qualification (both functional capability and structural integrity) of safety related mechanical and electrical equipment at all operating nuclear power plants. That NRC initiative led to the formation in 1982 of the Seismic Qualification Utility Group (SQUG) by U.S. utilities with older nuclear power plants that were subject to resolution of the NRC's Unresolved Safety Issue (USI) A-46, to develop, maintain, support, and broaden the use of earthquake experience data as a cost-effective method for seismic qualification of equipment. To address Generic Letter 87-02, ""Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) A-46," SQUG developed the Generic Implementation Procedure for Seismic Verification of Nuclear Plant Equipment. In 1992, the NRC identified the second revision of the Generic Implementation Procedure (GIP-2) as the definitive version for implementing the USI A-46 program. During the 2019 DBAI inspection, it is the GIP-2 criteria developed at Ginna to satisfy closure of USI A-46 that were used to determine that the diesel generator vault sump pumps would not adequately withstand a seismic event. No specific criteria had been developed

prior to the resolution of USI A-46. The discussion provided in Regulatory Guide 1.48 provides additional supporting information that there was no established method for performing seismic evaluations for active components as of 1973 (the date of its initial publication).

Although the Systematic Evaluation Program was comprehensive in nature, Seismic Qualification of many safety related components within in-scope systems was not explicitly evaluated. Based on the SEP documents cited, no specific criteria or analysis methods existed for safety related components. It follows that a methodology for evaluation of non-safety related components was also not established at the time of initial plant licensing.

Relationship between AIF-GDC-2 and IEEE standards

Atomic Industrial Forum General Design Criteria 2 (AIF-GDC-2) states, in part, "*Those systems and components of reactor facilities which are essential to the prevention or to the mitigation of the consequences of nuclear accidents ... shall be designed, fabricated, and erected to performance standards that enable such systems and components to withstand ... the forces that might reasonably be imposed by the occurrence of an extraordinary natural phenomenon, such as an earthquake.*" With regard to electrical power systems, the performance standards in effect at the time included IEEE 308-1971. Based on Table 1 of that standard, earthquakes are one of the design basis events within its scope. Therefore, design of electrical power systems in accordance with IEEE 308-1971 would meet the requirements of AIF-GDC-2. As previously discussed, isolation criteria and consideration of non-Class 1E circuits were not contained within IEEE 308-1971.

Safety Guide 29, Seismic Design Classification

Regarding Safety Guide 29, the Ginna Updated Final Safety Analysis Report (UFSAR), Section 1.8.1.29, states, "Although this Safety Guide had not been published at the time of the Ginna Station design and construction, the seismic classifications generally conform to the Guide." Similarly, being careful to preserve the original licensing basis, Section 1.8.2.9 discusses application of Regulatory Guide 1.29, Revision 3, stating, "New structures, systems, and components, and configuration changes meet the design and construction seismic requirements of the UFSAR or this Regulatory Guide." Because the sump pumps were originally installed in 1969, they do not qualify as new SSCs or configuration changes.

A review of Regulatory Guide (RG) 1.29, Revision 1 (1973) against Safety Guide 29 (1972) provides further insight into the applicable standards at the time Ginna was designed and licensed. RG 1.29, Revision 1, is used instead of RG 1.29, Revision 3 (1978), to provide a better context for when changes occurred.

RG 1.29, Revision 1, contains specific language relevant to non-safety related components. Specifically,

"Those portions of structures, systems, or components whose continued function is not required but whose failure could reduce the functioning of any plant feature included in items 1.a through 1.r. above to an unacceptable safety level should be designed and constructed so that the SSE would not cause such failure."

For Safety Guide 29, in a similar section (C.1) identifying which SSCs are to be designated as Class 1 and designed to withstand the effects of the SSE and remain functional, item "r." is:

"Structures, systems, or components whose failure could reduce the functioning of any plant feature included in items 1.a. through 1.q. above to an unacceptable safety level."

RG 1.29 clarified that the paragraphs apply to equipment whose function is not required, which is generally non-safety related equipment.

Conclusion

Isolation and coordination of non-safety related loads and circuit breakers is a currently accepted practice using standards that have been in effect since the late 1970s. The historical record also makes clear at what point these standards were revised to reflect these practices. However, because Ginna was designed and licensed prior to more recently accepted standards/regulations, differences exist between Ginna and later requirements. The Systematic Evaluation Program and Probabilistic Risk Assessments have been completed at Ginna to identify and resolve those differences where modifications would have a safety benefit to the station. The configuration of the motor control centers has been widely known and understood since original plant licensing.

As confirmed by probabilistic analyses performed specifically due to this Notice of Violation, the NRC calculated a 4E-7 delta Core Damage Frequency as a result of this configuration and EGC developed a best-estimate case which concluded there is a 1E-9/year delta Core Damage Frequency. Both results are well below the 1E-6 screening threshold used by the NRC for lesser safety significance during the Systematic Evaluation Program. EGC is committed to excellence in equipment reliability and has addressed this very low probability event by seismically securing the sump pumps such that the chance of failure is now eliminated. Notwithstanding this resolution, EGC contests this violation on the basis that it inconsistent with the original design and licensing basis for Ginna and requests the NRC to rescind the violation.

Finally, the NRC's position that Ginna should be in compliance with codes and standards instituted by the agency subsequent to the establishment of the plant's licensing basis clearly constitutes a backfit, and should have resulted in further analysis, consistent with Management Directive 8.4. Management Directive 8.4 unambiguously states that "[a] lack of historical staff position could be indicative of a new staff position and therefore subject to backfitting and forward fitting provisions and guidance." Management Directive 8.4 further directs that "[d]uring the course of dispositioning a proposed finding, violation, or licensing action, a licensee may raise concerns that the proposed action is either backfitting or forward fitting. The staff will inform divisional management of the concern before the proposed action is taken and discuss previous regulatory staff positions and enforcement precedent...." EGC believes that the position reflected in the Inspection Report constitutes a backfit and asks that the NRC assess these concerns consistent with agency backfitting processes.

(2) Corrective steps that have been taken and the results achieved

Although EGC contests this violation, modifications have been completed to seismically secure the sump pumps to eliminate movement and the associated failure that could potentially occur during a seismic event.

(3) Corrective steps that will be taken to avoid further violations

EGC contests this violation and does not believe any additional actions are required. Modifications to prevent movement of the sump pumps during a seismic event have been completed to improve equipment reliability for very low probability events.

(4) Date when full compliance will be achieved

EGC contests this violation and has presented a basis for why Ginna remains in compliance with its licensing basis. Modifications to prevent movement of the sump pumps during a seismic event were completed on October 14, 2019.