



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

September 13, 2021

Mr. David P. Rhoades  
Senior Vice President  
Exelon Generation Company, LLC  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Rd  
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 – CLOSEOUT OF  
BULLETIN 2012-01, "DESIGN VULNERABILITY IN ELECTRIC POWER  
SYSTEM"

Dear Mr. Rhoades:

The purpose of this letter is to inform you that the U.S. Nuclear Regulatory Commission (NRC) staff has verified that Exelon Generation Company, LLC (the licensee) has provided the necessary information requested in NRC's Bulletin (BL) 2012-01, "Design Vulnerability in Electric Power System," dated July 27, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12074A115), for Limerick Generating Station. The NRC staff has completed its review of this information and has closed out BL 2012-01 for this facility.

The NRC issued BL 2012-01 on July 27, 2012, to all holders of operating licenses and combined licenses for nuclear power reactors, except those who have permanently ceased operation and have certified that fuel has been removed from the reactor vessel. The Bulletin requested information about each facility's electric power system designs that would allow the NRC staff to verify the system's capability to address open phase conditions. Specifically, the NRC requested licensees to provide the following information:

- A description of how the protection scheme for engineered safety features buses (Class 1E for current operating plants or non-Class 1E for passive plants) is designed to detect and automatically respond to a single-phase open circuit condition or high impedance ground fault condition on offsite power circuits or another power source; and
- A description of the operating configuration of engineered safety features buses (Class 1E for current operating plants or non-Class 1E for passive plants) at power (i.e., normal operating condition).

By letter dated October 25, 2012 (ADAMS Accession No. ML12300A106), the licensee provided its response to BL 2012-01 for Limerick Generating Station. By letter dated February 3, 2014 (ADAMS Accession No. ML14034A179), the licensee provided supplemental information for this facility in response to an NRC staff request for additional information issued on December 20, 2013 (ADAMS Accession No. ML13351A314).

By letters dated October 9, 2013, and March 16, 2015 (ADAMS Accession Nos. ML13333A147 and ML15075A454, respectively), the Nuclear Energy Institute (NEI) submitted a voluntary industry initiative to address open phase conditions at nuclear power plants. The NEI letter

dated March 16, 2015, stated, in part: “The initiative is a formal commitment by the companies that operate nuclear power plants to follow a specific policy or plan of action. The initiative calls for a proactive plan and schedule for addressing potential design vulnerabilities to the open phase condition.”

To evaluate the adequacy of the open phase isolation systems designs, the NRC staff inspected four nuclear power plants with four distinct open phase isolation system designs using the NRC Temporary Instruction (TI) 2515/194, “Inspection of the Licensees’ Implementation of Industry Initiative Associated with the Open Phase Condition Design Vulnerabilities in Electric Power Systems (NRC Bulletin 2012-01),” dated October 31, 2017 (ADAMS Accession No. ML17137A416). A summary of the NRC staff’s preliminary observations and issues needing additional clarity were discussed with industry representatives in two public meetings conducted on September 19, 2018, and October 17, 2018. The meeting summaries can be found in ADAMS under Package Accession Nos. ML18268A342 and ML18309A226, respectively.

By letter dated June 6, 2019 (ADAMS Accession No. ML19163A176), the NEI submitted Revision 3 of the voluntary industry initiative to include an option for plants to perform a risk evaluation under certain boundary conditions to support manual response to an open phase condition. The NEI also submitted NEI 19-02, “Guidance for Assessing Open Phase Condition Implementation Using Risk Insights” on June 20, 2019 (ADAMS Accession No. ML19172A086).

In December 2020, the NRC staff performed an inspection using TI 2515/194, Revision 3, at Limerick Generating Station to verify the licensee’s implementation of the voluntary industry initiative at this facility. To address the open phase condition design vulnerability issue at this facility, the licensee implemented open phase isolation system plant modifications, which provide detection and alarm in the control room, and necessary plant procedures that allow operators to diagnose and take manual action to mitigate an open phase condition. The NRC inspection report listed below documents the results of this TI 2515/194 inspection.

- Limerick Generating Station, Units 1 and 2 – Temporary Instruction 2515/194 Inspection Report 05000352/2020015 and 05000353/2020015, dated January 4, 2021 (ADAMS Accession No. ML21004A133)

The NRC staff reviewed the information submitted by the licensee and the results of the TI 2515/194 inspection for Limerick Generating Station. No findings nor exceptions were identified. Based on this review, the NRC staff concludes that the licensee provided the necessary information requested in BL 2012-01 and has completed the implementation of its open phase isolation system. Therefore, the NRC staff has closed BL 2012-01 for Limerick Generating Station.

If you have any questions, please contact me at 301-415-2597 or by e-mail to [V.Sreenivas@nrc.gov](mailto:V.Sreenivas@nrc.gov)

Sincerely,

**/RA/**

V. Sreenivas, Project Manager  
Plant Licensing Branch I  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-352, 50-353

cc: Listserv

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 – CLOSEOUT OF  
BULLETIN 2012-01, “DESIGN VULNERABILITY IN ELECTRIC POWER  
SYSTEM” DATED SEPTEMBER 13, 2021

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**ADAMS Accession No. ML21245A084****\*by email**

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