



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

April 27, 2021

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

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2, BYRON STATION, UNIT NOS. 1 AND 2, DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3, LASALLE COUNTY STATION, UNITS 1 AND 2, AND QUAD CITIES NUCLEAR POWER 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 (Exelon, the licensee) has provided the necessary information requested in Bulletin 2012-01, “Design Vulnerability in Electric Power System” (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12074A115), for Braidwood Station (Braidwood), Units 1 and 2; Byron Station (Byron), Unit Nos. 1 and 2; Dresden Nuclear Power Station (Dresden), Units 2 and 3; LaSalle County Station (LaSalle), Units 1 and 2; and Quad Cities Nuclear Power Station (Quad Cities), Units 1 and 2. The NRC staff has completed its review of this information and has closed out Bulletin 2012-01 for these facilities.

The NRC issued Bulletin 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 Bulletin 2012-01 for Braidwood, Units 1 and 2; Byron, Unit Nos. 1 and 2; Dresden, Units 2 and 3; LaSalle, Units 1 and 2; and Quad Cities, Units 1 and 2. By letter dated February 3, 2014 (ADAMS Accession No. ML14034A179), the licensee provided supplemental information for these facilities in response to an NRC staff request for additional information (RAI) issued on December 20, 2013 (ADAMS Accession No. ML13351A314). The licensee's letters also provided information for Clinton Power Station (Clinton), Unit No. 1; Limerick Generating Station (Limerick), Units 1 and 2; Oyster Creek Nuclear Generating Station (Oyster Creek); Peach Bottom Atomic Power Station (Peach Bottom), Units 2 and 3; and Three Mile Island Nuclear Station (TMI), Unit 1. NRC closure of Bulletin 2012-01 for Clinton, Limerick, and Peach Bottom will be documented separately. No further action is planned for TMI, Unit 1, since it has permanently ceased operations. Oyster Creek is no longer owned or operated by Exelon.

By letters dated October 9, 2013, and March 16, 2015 (ADAMS Package 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 the 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.

In November 2019, April 2018, December 2019, October 2019, and May 2019, the NRC staff performed inspections using TI 2515/194 at Braidwood, Byron, Dresden, LaSalle, and Quad Cities, respectively, to verify the licensee's implementation of Revision 1 of the voluntary industry initiative at these facilities. To address the open phase condition design vulnerability issue at these facilities, the licensee implemented open phase isolation system plant modifications, which provide detection, alarm, and automatic protective features. The NRC inspection reports listed below document the results of these TI 2515/194 inspections. No findings or violations of more than minor significance were identified.

- NRC Inspection Report 05000456/2019011 and 05000457/2019011, "Braidwood Station Units 1 and 2 – NRC Inspection of Temporary Instruction 2515/194, Inspection of the Licensee's Implementation of Industry Initiative Associated with the Open Phase Condition Design Vulnerabilities in Electric Power Systems (NRC Bulletin 2012-01) Report 05000456/2019011 and 05000457/2019011," dated December 19, 2019 (ADAMS Accession No. ML19353B470).

- NRC Inspection Report 05000454/2018011 and 05000455/2018011, “Byron Station, Units 1 and 2—NRC Inspection of Temporary Instruction 2515/194, Inspection of the Licensee’s Implementation of Industry Initiative Associated with the Open Phase Condition Design Vulnerabilities in Electric Power Systems (NRC Bulletin 2012-01)—Inspection Report 05000454/2018011; 05000455/2018011,” dated May 17, 2018 (ADAMS Accession No. ML18138A136).
- NRC Inspection Report 05000237/2019011 and 05000249/2019011, “Dresden Nuclear Power Station, Units 2 and 3 – Temporary Instruction 2515/194 Inspection of the Licensee’s Implementation of Industry Initiative Associated with the Open Phase Condition Design Vulnerabilities in Electric Power Systems Report 05000237/2019011 and 05000249/2019011,” dated January 13, 2020 (ADAMS Accession No. ML20013F331).
- NRC Inspection Report 05000254/2019012 and 05000265/2019012, “Quad Cities Nuclear Power Station, Units 1 and 2—NRC Inspection of Temporary Instruction 2515/194, Inspection of the Licensee’s Implementation of Industry Initiative Associated with the Open Phase Condition Design Vulnerabilities in Electric Power Systems (NRC Bulletin 2012-01); Inspection Report 05000254/2019012 and 05000265/2019012,” dated June 26, 2019 (ADAMS Accession No. ML19178A247).

The NRC staff has reviewed the information submitted by the licensee and the results of the TI 2515/194 inspections for Braidwood, Units 1 and 2; Byron, Unit Nos. 1 and 2; Dresden, Units 2 and 3; LaSalle, Units 1 and 2; and Quad Cities, Units 1 and 2. Based on this review, the NRC staff concludes that the licensee provided the necessary information requested in Bulletin 2012-01. Therefore, the NRC staff has closed Bulletin 2012-01 for Braidwood, Units 1 and 2; Byron, Unit Nos. 1 and 2; Dresden, Units 2 and 3; LaSalle, Units 1 and 2; and Quad Cities, Units 1 and 2.

If you have any questions, please contact me at 301-415-1380 or by e-mail to [Blake.Purnell@nrc.gov](mailto:Blake.Purnell@nrc.gov).

Sincerely,

*/RA/*

Blake A. Purnell, Project Manager  
Plant Licensing Branch III  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-456, STN 50-457, STN  
50-454, STN 50-455, 50-237, 50-249, 50-373,  
50-374, 50-254, 50-265, and 50-289

cc: Listserv

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**ADAMS Accession No. ML21102A182**

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