



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

March 29, 2022

Mr. Ernest J. Kapopoulos, Jr.
Site Vice President
H. B. Robinson Steam Electric Plant
Duke Energy Progress, LLC
3581 West Entrance Road, RNPA01
Hartsville, SC 29550

SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT – CLOSEOUT OF BULLETIN
2012-01, “DESIGN VULNERABILITY IN ELECTRIC POWER SYSTEM”

Dear Mr. Kapopoulos:

The purpose of this letter is to inform you that the U.S. Nuclear Regulatory Commission (NRC) staff has verified that Duke Energy Progress, 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 H. B. Robinson Steam Electric Plant (Robinson). 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. ML12310A312), the licensee provided its response to BL 2012-01 for Robinson. By letter dated February 3, 2014 (ADAMS Accession No. ML14037A107), 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 issued 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), which provided temporary inspection instructions for the purpose of verifying that licensees appropriately implemented the NEI voluntary industry initiative dated March 16, 2015. The NRC staff piloted the use of TI 2515/194 by inspecting four nuclear power plants with four distinct open phase isolation system designs. 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), 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. NEI also submitted NEI 19-02, “Guidance for Assessing Open Phase Condition Implementation Using Risk Insights” on June 20, 2019 (ADAMS Accession No. ML19172A086). On August 18, 2020, the NRC staff issued Revision 2 of TI 2515/194 (ADAMS Accession No. ML20230A328), which provided temporary inspection instructions for the purpose of verifying that licensees appropriately implemented Revision 3 of the NEI voluntary industry initiative. The revision accounted for changes reflected in Revision 3 of the NEI voluntary initiative.

In August 2019, the NRC staff performed inspections at Robinson using TI 2515/194 dated October 31, 2017. In June 2021, the NRC staff performed inspections at Robinson using TI 2515/194 Revision 2. These inspections at Robinson were performed 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 reports listed below document the results of the TI 2515/194 inspections.

- H. B. Robinson Steam Electric Plant – Temporary Instruction 2515/194 Inspection Report 05000261/2019011, dated September 5, 2019 (ADAMS Accession No. ML19248C229)
- H. B. Robinson Steam Electric Plant – Integrated Inspection Report 05000261/2021002, dated August 3, 2021 (ADAMS Accession No. ML21216A001)

The NRC staff reviewed the information submitted by the licensee and the results of the TI 2515/194 inspections for Robinson. Two minor exceptions were identified: (1) incomplete

design change package at the time of the first inspection, and (2) the open phase condition related procedures were distributed to the wrong department. The licensee captured these exceptions in their corrective action program. The staff found this acceptable. 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 closes BL 2012-01 for Robinson.

If you have any questions, please contact me at 301-415-1387 or Tanya.Hood@nrc.gov.

Sincerely,

/RA/

Tanya E. Hood, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-261

cc: Listserv

SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT – CLOSEOUT OF BULLETIN 2012-01, “DESIGN VULNERABILITY IN ELECTRIC POWER SYSTEM” DATED MARCH 29, 2022

DISTRIBUTION:

PUBLIC	WMorton, NRR
PM File Copy	KNguyen, NRR
RidsNrrLARButler Resource	VGoel, NRR
RidsRgn2MailCenter Resource	RRodriguez, NRR
RidsACRS_MailCTR Resource	AZoulis, NRR
RidsNrrDexEEEEB Resource	LRegner, NRR
RidsNrrDoriLpl2-2 Resource	DWrona, NRR
RidsNrrDraApob Resource	
RidsNrrDroloeb Resource	
RidsNrrPMRobinson Resource	

ADAMS Accession No.: ML22083A003

OFFICE	NRR/DORL/LPL2-2/PM	NRR/DORL/LPL2-2/LA	NRR/DEX/EEEEB/BC
NAME	THood	RButler	WMorton
DATE	03/23/2022	03/24/2022	02/28/2022
OFFICE	NRR/DRA/APOB/BC	NRR/DRO/IOEB/BC	NRR/DORL/LPL2-2/BC
NAME	AZoulis	LRegner	DWrona
DATE	03/25/2022	03/25/2022	03/29/2022
OFFICE	NRR/DORL/LPL2-2/PM		
NAME	THood		
DATE	03/29/2022		

OFFICIAL RECORD COPY