



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

May 26, 2022

Mr. Christopher P. Domingos
Site Vice President
Northern States Power Company – Minnesota
Prairie Island Nuclear Generating Plant
1717 Wakonade Drive East
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2 –
CLOSEOUT OF BULLETIN 2012-01, "DESIGN VULNERABILITY IN ELECTRIC
POWER SYSTEM" (EPID L-2017-CRS-0063)

Dear Mr. Domingos:

The purpose of this letter is to inform you that the U.S. Nuclear Regulatory Commission (NRC) staff has verified that Northern States Power Company (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 Prairie Island Nuclear Generating Plant, Units 1 and 2 (Prairie Island). The NRC staff has completed its review of this information and this letter closes out BL 2012-01 for Prairie Island.

The NRC issued BL 2012-01 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 BL 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 provide the following information:

- A description of how the protection scheme for engineered safety features buses (Class 1E for currently operating 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 currently operating plants) at power (i.e., normal operating condition).

By letter dated October 18, 2012 (ML12318A285), the licensee provided its response to BL 2012-01 for Prairie Island. By letter dated February 3, 2014 (ML14034A066), the licensee provided supplemental information for Prairie Island in response to an NRC staff request for additional information issued on December 20, 2013 (ML13351A314).

By letters dated October 9, 2013, and March 16, 2015 (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 (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 (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 (ML19172A086). On August 18, 2020, the NRC staff issued Revision 2 of TI 2515/194 (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 September 2021, the NRC staff performed an inspection at Prairie Island using TI 2515/194 Revision 2. The inspection was performed to verify the licensee’s implementation of the voluntary industry initiative at Prairie Island. To address the potential open phase condition design vulnerability issue at Prairie Island, 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 staff documented the results of the TI 2515/194 inspection in a report dated October 27, 2021 (ML21299A295).

The NRC staff reviewed the information submitted by the licensee and the results of the TI 2515/194 inspection for Prairie Island. Two exceptions were identified in the inspection report: (1) the Updated Safety Analysis Report was not updated with complete description of the as-built configuration of the open phase detection system; and (2) maintenance for the open phase detection system has not been developed. The licensee captured these exceptions in their corrective action program. 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 Prairie Island.

If you have any questions, please contact me at 301-415-3733 or Robert.Kuntz@nrc.gov.

Sincerely,

/RA/

Robert Kuntz, Senior Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-282 and 50-306

cc: Listserv

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DATE	5/25/2022	5/25/2022	5/25/2022
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