Xcel Energy®

Prairie Island Nuclear Generating Plant
1717 Wakonade Drive East
Welch, MN 55089

APR 14 2016

L-PI-16-031
10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant Units 1 and 2
Dockets 50-282 and 50-306
Renewed Facility Operating License Nos. DPR-42 and DPR-60

Response to Requests for Additional Information -- License Amendment Request to Revise Technical Specifications to Adopt TSTF-523, "Generic Letter 2008-01, Managing Gas Accumulation," Revision 2, Using the Consolidated Line Item Improvement Process (CAC Nos. MF6449 and MF6450)

References:

1. NSPM letter, S. Sharp to NRC Document Control Desk, Application to Revise Technical Specifications to Adopt TSTF-523, "Generic Letter 2008-01, Managing Gas Accumulation," Using the Consolidated Line Item Improvement Process, L-PI-15-030, dated June 29, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15187A259)

2. Technical Specification Task Force Traveler No. 523 (TSTF-523), "Generic Letter 2008-01, Managing Gas Accumulation," Revision 2 (ADAMS Accession No. ML13053A075). TSTF-523 Notice of Availability, 79 Fed. Reg. 2700 (January 15, 2014)

3. NRC email, T. Beltz to G. Carlson, Prairie Island Nuclear Generating Plant, Requests for Additional Information (Draft) re: License Amendment Request to Adopt TSTF-523 (CAC Nos. MF6449 and MF6450), dated October 27, 2015

4. NSPM letter, K. Davison to NRC Document Control Desk, License Amendment Request (LAR) to Revise Technical Specifications (TS) to Adopt TSTF-523, "Generic Letter 2008-01, Managing Gas Accumulation," Using the Consolidated Line Item Improvement Process - Response to Request for Additional Information, L-PI-15-105, dated December 30, 2015 (ADAMS Accession No. ML15364A466)

5. NSPM letter, K. Davison to NRC Document Control Desk, Supplement to License Amendment Request to Revise Technical Specifications to Adopt TSTF-523, "Generic Letter 2008-01, Managing Gas Accumulation", Revision 2, Using the Consolidated Line Item Improvement Process (CAC Nos. MF6449 and MF6450), L-PI-16-003, dated January 25, 2016 (ADAMS Accession No. ML16025A162)

6. NRC email, R. Kuntz to G. Carlson, Prairie Island Nuclear Generating Plant, Units 1 and 2, Request for Additional Information Related to License Amendment Request to Adopt TSTF-523, "GL 2008-01, Managing Gas Accumulation" (CAC Nos. MF6449 and MF6450), dated March 2, 2016 (ADAMS Accession No. ML16075A080)

7. NSPM letter, S. Northard to NRC Document Control Desk, Response to Requests for Additional Information -- License Amendment Request to Revise Technical Specifications to Adopt TSTF-523. "Generic Letter 2008-01, Managing Gas Accumulation," Revision 2, Using the Consolidated Line Item Improvement Process (CAC Nos. MF6449 and MF6450), L-PI-16-029, dated March 31, 2016 (ADAMS Accession No. ML16091A405)

8. NRC email, R. Kuntz to G. Carlson, dated 3/29/2015

By Reference 1, Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), submitted to the U.S. Nuclear Regulatory Commission (NRC) a License Amendment Request (LAR) to revise the Technical Specifications for Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2, to adopt TSTF-523 (Reference 2) using the Consolidated Line Item Improvement Process. By Reference 3, the NRC Staff provided a request for additional information (RAI) on the LAR. By Reference 4, NSPM responded to the staff RAI and committed to submit a supplement to the LAR. By Reference 5, NSPM submitted the LAR supplement.

By Reference 6, the NRC Staff provided additional RAIs SR3.5.2.5-1, SR3.5.2.5-2, and SR3.5.2.5-3 on the LAR. By Reference 7, NSPM responded to RAIs SR3.5.2.5-2 and SR3.5.2.5-3. As agreed between the NRC Project Manager for PINGP and NSPM (Reference 8), NSPM herewith submits Attachment 1 in response to RAI SR3.5.2.5-1.

NSPM submits this letter in accordance with 10 CFR 50.90. This letter does not change the conclusions of the No Significant Hazards Consideration determination nor the Environmental Evaluation in Reference 1.

NSPM requests the NRC issue the requested license amendment by June 30, 2016, with the amendment to be implemented within 90 days of issuance.

In accordance with 10 CFR 50.91, NSPM is providing a copy of this letter to the designated State of Minnesota official.

If there is any question or if additional information is needed, please contact Dr. Glenn A. Carlson, P.E., at 651-267-1755.

Summary of Commitments

PINGP will evaluate potential modifications to enhance the monitoring of the inaccessible locations at a 31-day frequency.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on APR 14 2016

Scott Northard
Acting Site Vice President – Prairie Island Nuclear Generating Plant
Northern States Power Company – Minnesota

Attachment (1)

cc: Administrator, Region III, NRC
Project Manager, PINGP, NRC
Resident Inspectors, PINGP, NRC
State of Minnesota

**ATTACHMENT 1**
**Responses to NRC Requests for Additional Information**

**RAI SR3.5.2.5-1**

LAR Section 2.2 states that if the first-off check valve is leaking at a rate greater than the second-off check valve, then the volume between the check valves will pressurize and a void cannot form.

Provide the following information related to the potential for void formation between these two check valves:

If a leak should occur, could the pressure in the volume between the valves initially be low enough for outgassing to occur with the gas volume not being immediately reabsorbed as the volume pressurizes? If so, the leak rate through the first valve will decrease and through the second valve will increase as the intermediate gas volume is pressurized. Could the resulting condition result in void formation?

**PINGP Response**

Safety injection system inaccessible location configuration

The four inaccessible locations are designated 1SI-44 and 1SI-45 for Unit 1 and 2SI-14A and 2SI-14B for Unit 2. The inaccessible locations are located on corresponding line numbers 2-SI-35A, 2-SI-35B, 2-2SI-35A and 2-2SI-35B. These locations are adjacent to the reactor coolant system (RCS) first-off pressure isolation check valves and are inaccessible during normal operations due to dose and temperature concerns.

The safety injection (SI) system piping injects into each of the RCS cold legs through a single common pipe that branches into two separate 2-inch lines. On each of the 2-inch branches, there are two check valves installed that are the pressure boundary valves for the RCS. The first-off check valves (SI-9-1, SI-9-2, 2SI-9-1, and 2SI-9-2) are 6-inch swing disc check valves. The second-off check valves (SI-16-4, SI-16-5, 2SI-16-4, and 2SI-16-6) are 2-inch spring loaded plug type check valves.

The geometry of the four inaccessible locations consists of a vertically oriented 6-inch check valve that connects to the RCS loop piping with RCS pressure on the downstream side of the disc. These locations are all high points that would allow gas to accumulate inside the check valve on the upstream side.

The locations are inaccessible due to high dose rates during power operation and their proximity to the RCS loop piping. The locations are examined at the piping adjacent the check valve due to the valve configuration and examination limitations.

Gas intrusion source

The SI piping connects directly to a pressurized RCS. Dissolved gases in the reactor coolant are controlled by the Chemical and Volume Control System (VC) that maintains the concentration of hydrogen or nitrogen gas present through the Volume Control Tank (VCT). The current Gas Accumulation Management Program (GAMP) indicates if back-leakage were to occur, the lower pressure on the upstream side of the check valve would result in hydrogen gas coming out of solution and a void formation. Thus these locations meet the definition of susceptible locations according to the program documents.

Three scenarios describe the specific leakage conditions that must exist for a void to form at the inaccessible locations:

Scenario 1 – If only a single check valve is leaking, a void cannot form.

Scenario 2 – If the first-off check valve is leaking at a rate that is greater than the second-off check valve, then the area between the check valves will pressurize and a void cannot form.

The design leakage limit for these check valves is 3 cc/hr per inch of nominal pipe size. This means that the 6" first-off check valves would have a design leakage rate of 18 cc/hr and the 2" second-off check valves would have a design leakage rate of 6 cc/hr. This design leakage rate is important to consider since it is impossible to design a zero leakage check valve with hard seats. Since the first-off check valves have a higher design leakage rate than the second-off check valves, void formation is unlikely. This is because a higher leakage through the first-off check valves, when compared to the second-off check valves, would tend to pressurize the piping between the check valves, which would prevent void formation.

Scenario 3 – For void formation to occur, both the first-off and second-off pressure boundary check valves need to be leaking under special circumstances:

a. First-off check valve is leaking at a rate that is greater than the second-off check valve, refer to Scenario 2.

b. Second-off check valve stuck opened or malfunction; a void will only form if the second-off check valve is leaking at a greater rate than the first-off check valve, since that is the only condition that will simultaneously allow leakage from the RCS and also prevent pressure buildup between the check valves.

Alternative monitoring

Alternative monitoring is proposed for the four inaccessible locations on the SI injection lines to the RCS cold legs that are susceptible to gas accumulation between pressure isolation check valves. The current GAMP indicates specific circumstances are required for void formation due to gas coming out of solution.

For the inaccessible locations, inservice testing (IST) of the pressurize isolation check valves (PIV) is performed each cycle and leakage rates are determined. PINGP will verify no measurable leakage is present or the leakage rate of the first-off check valves is greater than the corresponding second-off check valves in accordance with the needs of the GAMP program.

Reasonable assurance of safety is maintained by verifying the as-left conditions necessary for a void formation are not present at the beginning of the cycle; surveillance testing of the pumps on a quarterly basis and by monitoring of the locations when accessible.

Operating experience

PINGP Gas Accumulation Management Program performs inspection of the locations during shutdown for verification that no void growth has occurred. The operating experience for these locations has shown no void due to the intrusion mechanism for each unit. PINGP will continue analysis of the intrusion mechanism and will evaluate potential modifications to enhance the monitoring of the inaccessible locations at a 31-day frequency.