



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

May 16, 2024

The Honorable Christopher T. Hanson  
Chair  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

**SUBJECT:     REPORT ON THE SAFETY ASPECTS OF THE SUBSEQUENT LICENSE  
                  RENEWAL APPLICATION REVIEW OF MONTICELLO NUCLEAR  
                  GENERATING PLANT, UNIT 1**

Dear Chair Hanson:

During the 715<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards (ACRS), April 30 through May 2, 2024, we completed our review of the subsequent license renewal (SLR) application for the Monticello Nuclear Generating Plant, Unit 1 (MNGP), and the associated safety evaluation report prepared by staff. Our review considered actions by the Northern States Power Company, a Minnesota corporation (NSPM) to extend the license for MNGP by a subsequent period of 20 years beyond the currently approved 60 years of licensed operation. During this review, we had the benefit of discussions with representatives of the staff and NSPM. We also had the benefit of the referenced documents. This report fulfills the requirement of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 54.25 that the ACRS review and report on all license renewal applications.

### **CONCLUSION AND RECOMMENDATION**

1. The established programs and the commitments made by NSPM to manage age-related degradation provide confidence that MNGP can be operated in accordance with its current licensing basis for the subsequent period of extended operation (SPEO) without undue risk to the health and safety of the public.
2. The NSPM application for the SLR of the operating license for MNGP should be approved.

### **BACKGROUND**

The MNGP, a single unit generating station in Monticello, Minnesota, is a boiling water reactor with licensed output of 2004 megawatts thermal (MWt). The Nuclear Regulatory Commission (NRC) issued the initial operating license on September 8, 1970. In this application, NSPM requests renewal of the operating license for an additional 20 years beyond the expiration of their current license in 2030. The license would be extended to September 8, 2050.

## DISCUSSION

NSPM submitted an SLR application for MNGP in January 2023. NSPM applied lessons learned from previous applications, requests for additional information, and internal aging management program (AMP) experience in preparation of their application. An experienced, multidisciplinary team of corporate, site, and consultant personnel was assembled to develop the SLR application. NSPM followed the guidance in Generic Aging Lessons Learned Report for Subsequent License Renewal (GALL-SLR), and the Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants (SRP-SLR), resulting in a thorough SLR application.

NSPM has been making improvements in the MNGP facility informed by equipment performance monitoring. Over a series of outages in 2009, 2011 and 2013 the following equipment improvements were implemented: condensate and feedwater system pumps, motors, heat exchangers and the condensate demineralizers were replaced; the motors for the recirculation system motor-generator sets were upgraded; the main, reserve, and auxiliary transformers were replaced; and the steam dryer was replaced. NSPM has been monitoring the integrity and replacing fluid system piping throughout the period of extended operation. In 2011, the 345 kV switchyard underwent a major upgrade. Lastly, the cooling towers were replaced in 2023. These improvements to MNGP provide evidence of a strong commitment by NSPM to maintain the safe and reliable operation of the station.

There are a few technical issues that NSPM has addressed for SLR. NSPM has committed to upgrade the cathodic protection of buried pipe and tanks to ensure that degradation of these components is minimized. For piping in the seismic gap between the reactor and turbine buildings, monitoring strategies and pipe replacement plans have been established to make sure that performance remains acceptable through the SPEO. Additionally, the effects of neutron and gamma radiation exposure on concrete in the biological shield wall, steel in the biological shield wall liner and steel in the reactor vessel supports have been evaluated and determined to be acceptable.

NSPM will implement 45 AMPs for SLR, comprised of 37 existing programs and eight new programs. Of the new programs, all are consistent with the GALL-SLR report. Of the 37 existing programs, seven are consistent with the GALL-SLR report, 30 have enhancements and/or allowed exceptions, and none are plant specific. The staff found the programs, including those with enhancements and exceptions, to be acceptable.

NSPM has demonstrated the effectiveness of their programs to maintain material condition, sustain system and equipment performance, and identify and implement improvements to ensure facility safety and reliability. Commitments within the SLR application and in NSPM's responses to the staff audits and inspections provide confidence that these programs will be implemented effectively throughout the SPEO. The detailed elements of the AMPs and related commitments are documented in the proposed Updated Final Safety Analysis Report supplement and will be managed through NSPM's commitment tracking program.

Staff reviewed NSPM's application for SLR in accordance with the GALL-SLR and the SRP-SLR guidance documents. Conformance with this guidance provides the bases for a staff conclusion that an applicant for a subsequent license renewal of 20 additional years beyond its current approved license for 60 years will afford no undue risk to the public throughout the SPEO.

In the safety evaluation report, staff documented their review of the SLR application, additional information submitted by NSPM, and information obtained through staff audits, inspections, and responses to requests for additional information. The staff conducted three regulatory audits in 2023 and 2024 on the technical details of the SLR application. These audits included plant specific operating experience; irradiation of select structures and components; and buried piping. A Phase IV inspection was completed in June 2020. These activities evaluated the completeness of the structures, systems, and components identified within the scope of the MNGP SLR program, the suitability and adequacy of the aging management review, and the acceptability of the plant-specific time-limited aging analyses. There were no safety-significant findings identified during the corresponding inspections and audits. The new programs incorporated in this application augment the current facility monitoring and maintenance processes in place at MNGP. It is reasonable to conclude that the intended safety functions of the systems placed under the AMP programs will be maintained consistent with the MNGP current licensing basis for the SPEO, as required by 10 CFR 54.21(a)(3). The staff's extensive and detailed review of the SLR application, documented in the safety evaluation report, identified no open or confirmatory items. We concur with the staff's safety evaluation regarding these issues.

## SUMMARY

We conclude that the NSPM application for the MNGP subsequent license renewal meets the requirements described in 10 CFR 54.29(a)(1) and (a)(2). The established programs and the commitments made by NSPM to manage age-related degradation provide confidence that MNGP can be operated in accordance with its current licensing basis for the SPEO without undue risk to the health and safety of the public. The NSPM application for the SLR of the operating license for MNGP should be approved.

We are not requesting a formal response to this letter report.

Sincerely,



Signed by Kirchner, Walter  
on 05/16/24

Walter L. Kirchner  
Chair

## REFERENCES

1. Northern States Power Company, "Monticello Nuclear Generating Plant Subsequent License Renewal Application Sections 1 – 4 and Appendices A – D," January 2023 (ML23009A354).
2. U.S. Nuclear Regulatory Commission, "Safety Evaluation Related to the Subsequent License Renewal of Monticello Nuclear Generating Plant, Unit 1," March 2024 (ML24077A001).
3. U.S. Nuclear Regulatory Commission, "Monticello Nuclear Generating Plant, Unit 1 – Report for the Aging Management Audit Regarding the Subsequent License Renewal Application Review (EPID No. L-2022-SLR-0000)," August 31, 2023 (ML23214A241).

4. U.S. Nuclear Regulatory Commission, "Monticello Nuclear Generating Plant – Limited Aging Management Audit Report Regarding the Subsequent License Renewal Application Review (EPID No. L-2022-SLR-0000)," February 27, 2024 (ML24054A158).
5. U.S. Nuclear Regulatory Commission, "Monticello Nuclear Generating Plant – Second Limited Aging Management Audit Report Regarding the Subsequent License Renewal Application Review (EPID No. L-2022-SLR-0000)," February 26, 2024 (ML24047A092).
6. U.S. Nuclear Regulatory Commission, NUREG-2192, "Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants," July 2017 (ML17188A158).
7. U.S. Nuclear Regulatory Commission, "Monticello Nuclear Generating Plant – License Renewal Phase IV Report 050000263/2020014," June 30, 2020 (ML20182A685).
8. U.S. Nuclear Regulatory Commission, NUREG-1801, Revision 2, "Generic Aging Lessons Learned (GALL) Report," December 2010 (ML103490041).
9. U.S. Nuclear Regulatory Commission, NUREG-2191, Volume 1, "Generic Aging Lessons Learned for Subsequent License Renewal (GALL-SLR) Report," July 2017 (ML17187A031).
10. U.S. Nuclear Regulatory Commission, NUREG-2191, Volume 2, "Generic Aging Lessons Learned for Subsequent License Renewal (GALL-SLR) Report," July 2017 (ML17187A204).
11. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.188, Revision 1, "Standard Format and Content for Application to Renew Nuclear Power Plant Operating Licenses," September 2005 (ML051920430).
12. U.S. Nuclear Regulatory Commission, NUREG-2192, "Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants," July 2017 (ML17188A158).
13. U.S. Nuclear Regulatory Commission, NUREG-2221, "Technical Bases for Changes in the Subsequent License Renewal Guidance Documents NUREG–2191 and NUREG–2192," December 2017 (ML17362A126).
14. U.S. Nuclear Regulatory Commission, NUREG-2222, "Disposition of Public Comments on the Draft Subsequent License Renewal Guidance Documents NUREG–2191 and NUREG–2192," December 2017 (ML17362A143).
15. Nuclear Energy Institute, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 for Subsequent License Renewal" (NEI 17-01)," March 2017 (ML17339A599).
16. Nuclear Energy Institute, NEI 14-12, "Aging Management Program Effectiveness," December 31, 2014 (ML15090A665).

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