NRC FORM 588
(10-2000)
10 CFR 72

U. S. NUCLEAR REGULATORY COMMISSION

LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, *Code of Federal Regulations*, Chapter 1, Part 72, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, and possess the power reactor spent fuel and other radioactive materials associated with spent fuel storage designated below; to use such material for the purpose(s) and at the place(s) designated below; and to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified herein.

Licensee		
1. Northern States Power Company, a Minnesota corporation (NSPM) [1]	3. License No.	SNM-2506
	Amendment No.	
2. 414 Nicollet Mall Minneapolis, Minnesota, 55401-1927	4. Expiration Date	October 31, 2053
	5. Docket or Reference No.	72-10

6. Byproduct, Source, and/or Special Nuclear Material	7. Chemical or Physical Form	8. Maximum Amount That Licensee May Possess at Any One Time Under This License
A. Spent fuel assemblies from Prairie Island Nuclear Station Units 1 and 2 reactors, using natural water for cooling and enriched not greater than 3.85 (TN-40) and not greater than 5.00 (TN-40HT) percent U-235, and associated radioactive materials related to receipt, storage and transfer of the fuel assemblies	A. As UO_2 clad with zirconium or zirconium alloys	A. 715.29 TeU of spent fuel assemblies
B. Irradiated fuel assembly inserts from the Prairie Island Nuclear Station Units 1 and 2 reactor. An insert may be a burnable poison rod assembly (BPRA) or a thimble plug device (TPD).	B SS 304 structure, Inconel 718 spring, and borated pyrex glass.	B. One BPRA or TPD per spent fuel assembly.

[1] Northern States Power Company was incorporated in Minnesota as a wholly owned subsidiary of Xcel Energy Inc., effective August 18, 2000. This license, as amended, was amended to reflect the Commission's consent per 10 CFR Part 72, Section 72.50, to the license transfer approved by order dated May 12, 2000.

NRC FORM 588A (10-2000) 10 CFR 72 — U. S. NUCLEAR REGULATORY COMMISSION	PAGE 2 OF 7 PAGES	
LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE SUPPLEMENTARY SHEET	License No. SNM-2506	Amendment No.
	Docket or Reference No. 72-10	

9. Authorized Use: For use in accordance with statements, representations, and the conditions of the Technical Specifications. The basis for this license was submitted in the license renewal application dated October 20, 2011, as supplemented February 29, 2012; April 26, 2012; July 26, 2013; July 31, 2014, and August 11, 2014, and the Updated Safety Analysis Report (USAR) dated October 20, 2011, and September 3, 2014.

   The material identified in 6 and 7 above is authorized for receipt, possession, storage, and transfer.

10. Authorized Place of Use: The licensed material is to be received, possessed, transferred, and stored at the Prairie Island ISFSI located on the Prairie Island Nuclear Generating Plant site in Goodhue County, Minnesota.

11. This site is described in Chapter 2 of the Technical Specifications and Safety Analysis Report (TS/SAR) for the Prairie Island ISFSI.

12. The Technical Specifications contained in Appendix A attached hereto are incorporated into the license. NSPM shall operate the installation in accordance with the Technical Specifications in Appendix A.

13. NSPM shall fully implement and maintain in effect all provisions of the ISFSI physical security, guard training and qualification, and safeguards contingency plans previously approved by the Commission and all amendments made pursuant to the authority of 10 CFR 72.56, 72.44(e), and 72.186. The plans, which contain safeguards information protected under 10 CFR 73.21, are entitled: "Prairie Island Nuclear Generating Plant Independent Spent Fuel Storage Installation Physical Security Plan," Revision 0, submitted by letter dated March 10, 1992; "Prairie Island Nuclear Generating Plant Independent Spent Fuel Storage Installation Security Force Training and Qualification Plan," Revision 0, submitted by letter dated March 10, 1992; and "Prairie Island Nuclear Generating Plant Independent Spent Fuel Storage Installation Safeguards Contingency Plan," Revision 0, submitted by letter dated March 10, 1992.

14. The Technical Specifications for Environmental Protection contained in Appendix A attached hereto are incorporated into the license.

    Specifications required pursuant to 10 CFR 72.44(d), stating limits on the release of radioactive materials for compliance with limits of 10 CFR Part 20 and "as low as is reasonably achievable objective" for effluents are not applicable. Spent fuel storage cask external surface contamination within the limits of Technical Specification 3.2.1 ensures that the offsite dose will be inconsequential. In addition, there are no normal or off-normal releases or effluents expected from the double-sealed storage casks of the ISFSI.

    Specifications required pursuant to 10 CFR 72.44(d)(1), for operating procedures, for control of effluents, and for the maintenance and use of equipment in radioactive waste treatment systems, to meet the requirements of 10 CFR 72.104 are not applicable. There are, by the design of the sealed storage casks at the ISFSI, no effluent releases. Also, cask loading and unloading operations and waste treatment will occur at the Prairie Island Nuclear Generating Plant, under the specifications of its operating licenses.

DRAFT

NRC FORM 588A (10-2000) 10 CFR 72 — U. S. NUCLEAR REGULATORY COMMISSION	PAGE 3 OF 7 PAGES	
LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE **SUPPLEMENTARY SHEET**	License No. SNM-2506	Amendment No.
	Docket or Reference No. 72-10	

15. No spent nuclear fuel shall be allowed to be loaded until such time as the following preoperational license conditions are satisfied:

A A training exercise (Dry Run) of all spent fuel storage cask loading and handling activities shall be held, which shall include, but not be limited to, those listed, and which need not be performed in the order listed:

a. Moving cask in and out of spent fuel pool area

b. Loading fuel assembly (using dummy assembly)

c. Cask drying, sealing, and cover gas backfilling operations

d. Moving cask to, and placing it on, the storage pad

e. Returning the cask to the auxiliary building

f. Unloading the cask

g. Decontaminating the cask

h. All dry-run activities shall be done using written procedures

i. The activities listed above shall be performed or modified and performed to show that each activity can be successfully executed before actual fuel loading.

B The Prairie Island Nuclear Generating Plant Emergency Plan shall be reviewed and modified, as required, to include the ISFSI.

C A training module shall be developed for the Prairie Island Nuclear Generating Plant Training Program, establishing an ISFSI Training and Certification Program that will include the following:

a. Cask Design (overview)

b. ISFSI Facility Design (overview)

c. ISFSI Safety Analysis (overview)

d. Fuel loading and cask handling procedures and off-normal procedures

e. ISFSI License (overview).

D The Prairie Island Nuclear Generating Plant Radiation Protection Procedures shall be reviewed and modified, as required, to include the ISFSI.

E The Prairie Island Nuclear Generating Plant Administrative Procedures shall be reviewed and modified, as required, to include the ISFSI.

DRAFT

NRC FORM 588A (10-2000) 10 CFR 72 — U. S. NUCLEAR REGULATORY COMMISSION	PAGE 4 OF 7 PAGES	
LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE SUPPLEMENTARY SHEET	License No. SNM-2506	Amendment No.
	Docket or Reference No. 72-10	

F A procedure shall be developed and implemented for the documentation of the characterizations performed to select spent fuel to be stored in the casks. Such procedure shall include independent verification of fuel assembly selection by an individual other than the original individual making the selection.

G A procedure shall be developed and implemented for two independent determinations (two samples analyzed by different individuals) of the boron concentration in the water used to fill the cask cavity for fuel loading and unloading activities.

H Written procedures shall be implemented to describe actions to be taken during operation, off-normal, and emergency conditions.

16. The design, construction, and operation of the ISFSI shall be accomplished in accordance with the U.S. Nuclear Regulatory Commission Regulations specified in Title 10 of the U.S. Code of Federal Regulations. All commitments to the applicable NRC regulatory guides and to engineering and construction codes shall be carried out.

17. Fuel and cask movement and handling activities that are to be performed in the Prairie Island Nuclear Generating Plant Auxiliary Building will be governed by the requirements of the Prairie Island Nuclear Generating Plant Facility Operating Licenses (DRP-42 and -60) and associated Technical Specifications.

18. The TN-40HT confinement boundary base material and associated welds shall be helium leak tested at the fabricator in accordance with ANSI N 14.5 to “leaktight” criteria. The TN-40 confinement boundary base material and associated welds shall be helium leak tested at the fabricator in accordance with ANSI N14.5 to “leaktight” criteria, if fabricated after the date of Amendment No. 7 approval.

19. Within 90 days after issuance of the license, Northern States Power Company-Minnesota shall submit an updated FSAR to the Commission and continue to update the FSAR pursuant to the requirements in 10 CFR 72.70(b) and (c).

The updated FSAR shall include Appendix C, Rev. 1, “Safety Analysis Report Supplement and Changes” [Agencywide Document Access and Management System (ADAMS) Accession Number ML14247A316] as documented in the Supplement to the License Renewal Application (hereinafter referred to as Appendix C). Any changes to the updated FSAR, including changes to Appendix C, shall be made via amendment or consistent with 10 CFR 72.48(c), as appropriate.

20. Northern States Power Company-Minnesota shall create, update, or revise procedures for implementing the activities in the Aging Management Programs (AMPs) summarized in Appendix C within 90 days of the renewed license issuance.

Northern States Power Company-Minnesota shall maintain procedures that implement the AMPs throughout the term of this license.

Each procedure for implementing the AMPs shall contain a reference to the specific AMP provision the procedure is intended to implement. The reference shall be maintained if procedures are modified.

Within 240 days of issuance of the renewed license, Northern States Power Company-Minnesota shall confirm, in a letter to the NRC (submitted pursuant to 10 CFR 72.4), that: (a) the procedures for implementation of the activities as described in the AMPs summarized in Appendix C, Rev. 1 are in place, (b) the procedures will be maintained for the term of this license, and (c) appropriate references to the AMPs are provided in the procedures.

DRAFT

NRC FORM 588A (10-2000) 10 CFR 72 — U. S. NUCLEAR REGULATORY COMMISSION	PAGE 5 OF 7 PAGES	
LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE SUPPLEMENTARY SHEET	License No. SNM-2506	Amendment No.
	Docket or Reference No. 72-10	

21. Northern States Power Company-Minnesota shall not remove (a) any structure, system or component (SSC) or subcomponent, or (b) any aging mechanism or aging effect, as detailed in Table 9.8-1 in Appendix C, from the scope of the AMPs.

22. With respect to the aging management activities for the concrete pads, as described in the "ISFSI Inspection and Monitoring Program" in Appendix A, Rev. 1, in the Supplement to the License Renewal Application [ADAMS Accession Number ML14234A463]:

    (a) The licensee shall perform visual inspections of all accessible concrete pad areas at intervals not less than those specified in ACI 349.3R-02.

    (b) The licensee shall perform visual inspections of non-accessible areas of the concrete pads by inspections of opportunity, including inspections of the concrete area underneath a cask if the cask is ever moved, and inspections of below-grade portions of the concrete pad if excavated, exposed or modified for any reason.

    (c) The licensee shall evaluate the findings from all visual inspections against the three-tier acceptance criteria defined in ACI 349.3R-02.

    (d) The licensee shall obtain groundwater chemistry samples representative of the ISFSI below-grade pad environment at intervals not to exceed six months. The licensee shall characterize these groundwater chemistry samples to monitor for an aggressive below-grade environment, as defined in ASME Code Section XI Subsection IWL.

23. With respect to the aging management activities for the dry storage (in-service) casks, as described in the "ISFSI Inspection and Monitoring Program" in Appendix A, Rev. 1, in the Supplement to the License Renewal Application [ADAMS Accession Number ML14234A463]:

    (a) The licensee shall perform visual inspections of accessible exterior surfaces of the dry storage (in-service) casks at intervals not to exceed every quarter.

    (b) The licensee shall perform visual inspections of non-accessible areas of the cask bottom and areas underneath the weather protective cover by inspections of opportunity, including inspections if a cask is lifted and the cover is removed for maintenance for any reason.

    (c) The licensee shall perform visual inspections of the cask bottom and areas underneath the weather protective cover at intervals not to exceed 20 years, for a minimum of one (1) canister.

    (d) The licensee shall inspect, at a minimum, for signs of corrosion, damage, and debris accumulation on the cask exterior surfaces during all visual inspections identified in License Condition 23.

    (e) The licensee shall evaluate for loss of intended function if any observable indication of corrosion is identified during any of the visual inspections in License Condition 23.

24. With respect to the aging management activities for the polymer-based neutron shields of the dry storage (in-service) casks as described in the "ISFSI Inspection and Monitoring Program" in Appendix A,

DRAFT

NRC FORM 588A (10-2000) 10 CFR 72 — U. S. NUCLEAR REGULATORY COMMISSION	PAGE 6 OF 7 PAGES	
LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE SUPPLEMENTARY SHEET	License No. SNM-2506	Amendment No.
	Docket or Reference No. 72-10	

Rev. 1, in the Supplement to the License Renewal Application [ADAMS Accession Number ML14234A463]:

(a) Within 90 days of the issuance of the renewed license, Northern States Power Company-Minnesota shall establish baseline values for dose rate trending analyses to be used in detecting any potential loss of intended function of the neutron shield.

(b) Thereafter, Northern States Power Company-Minnesota shall continue to perform dose rate surveys for each loaded cask at an interval not to exceed three months, as is consistent with the aging management program "ISFSI Inspection and Monitoring Program."

(c) Northern States Power Company-Minnesota shall compare the measured dose rate data with the established baseline values to detect any increase in neutron dose rates. Upon detecting any unexpected upward trend in the measured neutron dose rates, Northern States Power Company-Minnesota shall place the non-compliant cask into their corrective actions program to evaluate the cause for loss of intended function and determine whether a similar problem could occur within other casks.

25. With respect to the aging management activities for the earthen berm, as described in the "ISFSI Inspection and Monitoring Program" in Appendix A, Rev. 1, in the Supplement to the License Renewal Application [ADAMS Accession Number ML14234A463]:

(a) The licensee shall perform visual inspections of all accessible areas of the earthen berm at intervals not to exceed every five years.

(b) The licensee shall inspect, at a minimum, for loss of material, loss of form, and slope instability.

DRAFT

26. Northern States Power Company-Minnesota shall submit an evaluation of the results of the confirmatory evaluation related to high burnup fuel cladding performance specified in the "High Burnup Fuel Aging Management Program" in Appendix A, Rev. 1, in the Supplement to the License Renewal Application (ML14234A463), in a letter to the NRC (submitted pursuant to 10 CFR 72.4), by April 4, 2028 to serve as confirmation that the high burnup fuel continues to perform as expected per ISG-11, Revision 3. The evaluation shall include an assessment of the ability of stored high burnup fuel assemblies to continue to perform the intended function(s). If the licensee identifies fuel which is unable to perform the intended function(s), the licensee shall cease use of such cask or submit a license amendment request to modify this license condition.

NRC FORM 588A (10-2000) 10 CFR 72 — U. S. NUCLEAR REGULATORY COMMISSION	PAGE 7 OF 7 PAGES	
LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE **SUPPLEMENTARY SHEET**	License No. SNM-2506	Amendment No.
	Docket or Reference No. 72-10	

27. This renewed license is effective as of the date of issuance shown below.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Michele Sampson, Chief
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards
Washington, DC 20555

Date of Issuance: October 19, 1993
Renewed License: Dated ----
Attachment: Technical Specifications

DRAFT