DD-98-02

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION
Samuel J. Collins, Director

In the Matter of	)	
	)	
NORTHERN STATES POWER COMPANY	)	Docket Nos. 50-282,
	)	50-306, and 72-10
(Prairie Island Nuclear Plant and	)	
Prairie Island Independent Spent	)	(10 CFR 2.206)
Fuel Storage Installation)	)	
	)	

DIRECTOR'S DECISION UNDER 10 CFR 2.206

I INTRODUCTION

On August 26, 1997, the Prairie Island Coalition filed a Petition pursuant to Section 2.206 of Title 10 of the Code of Federal Regulations (10 CFR 2.206) requesting that the U.S. Nuclear Regulatory Commission (NRC) take action to accomplish the following:

1. Suspend Northern States Power Company's (the licensee's) Materials License No. SNM-2506 for cause under Section 50.100 of Title 10 of the Code of Federal Regulations (10 CFR 50.100) until all material issues regarding the maintenance, unloading, and decommissioning processes and procedures, as described in the Petition and in an earlier Petition filed on May 23, 1997, by the Prairie Island Indian Community, have been adequately addressed and resolved, and until the maintenance and unloading processes and procedures in question are safely demonstrated under the scrutiny of independent third-party review of the TN-40 cask seal maintenance and unloading procedure;

2. Determine that the licensee violated 10 CFR 72.122(f) by using a cask design that requires periodic seal maintenance and emergency seal replacement that must be performed in the plant storage pool. The Petitioner asserts that these casks cannot be placed back into the pool to perform these functions due to unresolved problems with fuel degradation during storage, flash steam, thermal shock, and the resulting potential for radiation dispersion;

3. Determine that the licensee violated 10 CFR 72.122(h) by using a cask that must be placed into the pool for necessary maintenance and/or unloading procedures. The Petitioner asserts that such placement of the cask into the pool will prematurely degrade the fuel and pose operational safety problems with respect to its ultimate and necessary removal from dry-cask storage;

4. Determine that the licensee violated 10 CFR 72.122(l) by loading casks and storing them before developing and preparing procedures adequate to safely unload and decommission the TN-40 casks;

5. Determine that the licensee violated 10 CFR 72.130 by using the TN-40 cask and failing to make provisions capable of accomplishing the removal of radioactive waste and contaminated materials at the time the independent spent fuel storage installation (ISFSI) is permanently decommissioned;

6. Determine that the licensee violated 10 CFR 72.11 by failing to provide and include complete and accurate material information regarding maintenance and unloading of TN-40 casks in the application for the Prairie Island ISFSI and in subsequent submittals regarding cask maintenance and unloading issues;

7. Determine that the licensee violated 10 CFR 72.12 by deliberately and knowingly submitting incomplete and inaccurate material information regarding maintenance and unloading of TN-40 casks in the application for the Prairie Island ISFSI and in subsequent submittals regarding cask maintenance and unloading issues;

8. Require that the licensee pay a substantial penalty for each cask loaded in violation of NRC regulations;

9. Administer such other sanctions for the alleged violations of NRC regulations as the NRC deems necessary and appropriate;

10. Provide Petitioner the opportunity to participate in a public review of maintenance, unloading, and decommissioning processes and procedures in question and an opportunity to comment on draft findings after investigation by the NRC;

11. Order modification of the licensee's Technical Specifications for the Prairie Island ISFSI to ensure a demonstrated ability to in fact safely maintain, unload, and decommission TN-40 casks; and

12. Review the licensee's processes and procedures for maintenance, unloading, and decommissioning, and if the licensee does not possess capability to unload casks, order the licensee to build a "hot shop" for air unloading of casks and transfer of the fuel.

The Petition has been referred to me pursuant to 10 CFR 2.206. The NRC letter dated October 2, 1997, to George Crocker, on behalf of the Petitioner, acknowledged receipt of the Petition and reported the NRC staff's determination that the Petition did not require immediate action to be taken by the NRC. The letter of October 2, 1997, also explained that the NRC staff

would address the requests for formal rulemaking proceedings as detailed in Items 13, 14, and 15 of the Petition, in accordance with 10 CFR 2.802, "Petition for Rulemaking." A notice of receipt was published in the FEDERAL REGISTER on October 10, 1997 (62 FR 53031).

On the basis of the NRC staff's evaluation of the issues and for the reasons given below, the Petitioner's requests as detailed in Items 1 through 12 of the Petition are denied.

II. BACKGROUND

On October 19, 1993, the NRC issued Materials License No. SNM-2506 to allow the licensee to store spent nuclear fuel in TN-40 dry-storage casks, designed by Transnuclear Incorporated, at the ISFSI located at the Prairie Island Nuclear Plant. The NRC issued Technical Specifications (TS) defining operating limits, surveillance requirements, design features, and administrative controls as Appendix A to Materials License No. SNM-2506. No spent nuclear fuel was allowed to be loaded into a storage cask at Prairie Island until several preoperational license conditions were satisfied. Among the preoperational license conditions were a required training exercise (dry-run) of the loading, handling, and unloading activities for the TN-40 casks and the implementation of written procedures describing the actions to be taken during operational, off-normal, and emergency conditions associated with the Prairie Island ISFSI.

A report dated April 20, 1995, submitted by the licensee to the NRC pursuant to 10 CFR 72.82(e), gave the results of the preoperational tests that the licensee was required to perform before loading spent fuel into a TN-40 cask.[1] On May 12, 1995, following the completion of the

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[1] On May 11, 1995, the NRC granted a schedular exemption to the provision of 10 CFR 72.82(e) that requires licensees to submit the preoperational test results at least 30 days before receipt of spent fuel into the ISFSI. The basis for the exemption was the fact that the NRC staff had

staff's reviews and inspections that found that the licensee had satisfied the conditions of the license, the licensee began loading spent fuel assemblies into a TN-40 cask. The licensee subsequently placed the cask, and casks loaded since that time, onto the storage pad within the Prairie Island ISFSI.

The NRC staff's determination that the licensee was in compliance with applicable regulations and license conditions was the basis for the NRC staff's decision to approve the ISFSI at Prairie Island and to allow the actual loading of TN-40 casks at that facility. The Petitioner has requested that, in light of the information in the Petition, the NRC staff reconsider its findings and suspend Materials License No. SNM-2506. The regulations cited by the Petitioner as those that establish technical requirements not being satisfied by the licensee for the ISFSI at Prairie Island are:

- 72.122(f) *Testing and maintenance of systems and components.* Systems and components that are important to safety must be designed to permit inspection, maintenance, and testing.

- 72.122(h) *Confinement barriers and systems.* (1) The spent fuel cladding must be protected during storage against degradation that leads to gross ruptures or the fuel must be otherwise confined such that degradation of the fuel during storage will not pose operational safety problems with respect to its removal from storage. This may be accomplished by canning of consolidated fuel rods or unconsolidated assemblies or other means as appropriate.

- 72.122(l) *Retrievability.* Storage systems must be designed to allow ready retrieval of spent fuel or high-level radioactive waste for further processing or disposal.

- 72.130 *Criteria for decommissioning.* The ISFSI or MRS (monitored retrievable storage [installation]) must be designed for decommissioning. Provisions must be made to facilitate decontamination of structures and equipment, minimize the quantity of radioactive wastes and contaminated equipment, and facilitate the removal of

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reviewed cask fabrication records, observed portions of the preoperational test activities, and completed its review of the report submitted on April 20, 1995.

radioactive wastes and contaminated materials at the time the ISFSI or MRS is permanently decommissioned.

The regulations in 10 CFR Part 72 require that the design of the storage system and the procedures implemented by specific licensees support the unloading activity, whether it is being performed to allow further processing or disposal of the spent fuel, such as may be necessary to support decommissioning of the ISFSI; as part of planned maintenance activities; or as part of the response to an unplanned event or condition. The unloading of a cask, for any reason, should be performed in a manner that prevents gross rupture of the fuel cladding, which could result in operational safety problems. Although unloading procedures need not contain detailed guidance on removing damaged fuel, they should contain precautions in case fuel cladding has unexpectedly degraded during storage so that additional measures can be taken to address increased radiological hazards during the unloading process.

NRC regulations, facility licenses, and NRC-approved quality assurance programs require licensees to establish and maintain a formal process for preparing and issuing procedures and changes thereto. NRC assessments of licensee procedures are generally conducted within the NRC's inspection program. The major procedures pertaining to dry-cask-storage activities at Prairie Island, including the procedure for unloading a cask, were reviewed by the NRC staff during a special inspection conducted from January 24 through May 11, 1995, to oversee the preoperational activities discussed above. In addition to reviewing the licensee's facility and procedures, as previously noted, the NRC inspectors observed preoperational testing that the licensee was required to perform before loading casks with spent fuel assemblies. The inspection findings are documented in NRC Inspection Report 50-282/95002; 50-306/95002; 72-10/95002(DRP), dated June 30, 1995.

The NRC inspectors noted several instances in which the procedures for dry-cask-storage activities that the licensee had in place at the beginning of the inspection, including the procedures for loading and unloading of TN-40 casks, did not ensure compliance with the requirements of the license. Although the licensee corrected these procedural deficiencies during the course of the inspection, the staff issued a Notice of Violation to the licensee for failing to satisfy Criterion V of Appendix B to 10 CFR Part 50, which, for activities affecting quality, requires the preparation of and adherence to procedures appropriate to the circumstances. In addition, the inspectors found weaknesses in the licensee's initial performance in overseeing the activities of the cask vendor and in overall planning for dry-cask-storage activities. On the basis of the licensing reviews and inspection findings, documented in Inspection Report 50-282/95002; 50-306/95002; 72-10/95002(DRP), the NRC staff concluded that as of May 1995, the licensee had corrected these deficiencies and was ready to safely load, and if necessary unload, spent nuclear fuel in TN-40 casks.

In July 1995, the NRC staff issued an action plan for dry-cask storage to manage the resolution of a variety of technical and process issues that were noted during the licensing reviews and inspections completed for the first several ISFSI facilities, including the ISFSI at Prairie Island. An item related to the loading and unloading of dry-storage casks was added to the action plan, in part to ensure that the importance of the unloading procedures was emphasized to licensees and that technical issues related to unloading problems were resolved. Addition of an item pertaining to unloading was deemed prudent because the staff observed that some of the licensees' unloading procedures failed to consider contingencies and assumptions related to possible fuel degradation, gas-sampling techniques, cask design issues, radiation

protection requirements, and the thermal-hydraulic behavior of a cask during the process of cooling and filling it with water from the spent fuel pool.

To fulfill the goals of its dry-cask-storage action plan, the NRC staff has emphasized the importance of unloading procedures and shared observations with licensees using or considering dry-cask storage. The staff revised inspection procedures and licensing review guidance to specifically instruct NRC inspectors to review unloading procedures developed by licensees and to identify those issues that warrant particular attention. Application of the revised guidance ensures that recent and future reviews will address the adequacy of unloading procedures developed by licensees. To address those ISFSIs that began operation before NRC improved its guidance on review and inspection, the staff audited or inspected those licensee programs for which the inspection record did not document whether the unloading procedures adequately addressed the major issues in the action plan. Regarding Prairie Island, the staff reviewed the available information and determined that the assessment of the unloading procedure performed as part of the inspection documented in NRC Inspection Report 50-282/95002; 50-306/95002; 72-10/95002(DRP) adequately addressed the concerns in the NRC action plan, and that additional reviews or inspections therefore were not necessary.

In a Petition dated June 5, 1995, Prairie Island Coalition requested that, among other things, the NRC review — and take whatever administrative actions were necessary concerning — the licensee's plans to unload a TN-40 cask if the spent fuel pool lacked sufficient space to accommodate the spent fuel assemblies from a cask. The NRC staff issued Northern States Power Company (Prairie Island Nuclear Generating Plant, Units 1 and 2), DD-96-21, 44 NRC 297, on November 27, 1996, denying the Petitioner's request. The denial was based,

in part, on the staff's finding that if a cask must be unloaded, it is unlikely that the need to unload it would represent a time-urgent activity and the licensee would be able to develop and execute a plan to maintain the safe storage of the spent fuel assemblies. The NRC staff determined that even if such an unlikely event occurred and the licensee needed to implement corrective actions to maintain safe storage conditions, options would be available to the licensee. These options include returning a cask to the auxiliary building, returning a cask to the spent fuel pool without actually removing the spent fuel, and removing non-fuel-bearing components from the spent fuel pool to allow the removal of fuel assemblies from a cask. Id., 44 NRC at 309.

The Petitioner has incorporated by reference a Petition dated May 28, 1997, filed by the Prairie Island Indian Community, which, among other things, asked the NRC to suspend Materials License No. SNM-2506 on the premise that the licensee has failed to establish adequate procedures for safely unloading the TN-40 dry-storage containers. The Prairie Island Indian Community also requested that an independent third-party review of the TN-40 unloading procedure be conducted, that they be given an opportunity to participate fully in the reviewing of the unloading procedure for the TN-40 cask, that the NRC hold hearings and allow them to participate fully in these and in any other procedures initiated in response to their Petition, and that the TS for the Prairie Island ISFSI be revised to incorporate mandatory unloading procedure requirements. The NRC issued Northern States Power Company (Prairie Island Nuclear Plant and Prairie Island Independent Spent Fuel Storage Installation), DD-97-18, on August 29, 1997, denying the requests made by the Prairie Island Indian Community. Although the staff acknowledged the potential difficulties in retrieving fuel from dry-storage casks if significant fuel degradation has occurred, the NRC staff concluded that licensees need not be required to

incorporate specific guidance into the normal unloading procedure to address this unlikely situation. This conclusion was based on the staff's findings that (1) the licensee's procedure could support the normal unloading of spent fuel assemblies from TN-40 casks at Prairie Island, (2) the licensee's unloading procedure contained the necessary measurements and precautions to detect if fuel had degraded during storage, and (3) the licensee could reasonably be expected to develop procedures to safely unload damaged fuel assemblies in the unlikely event that fuel did degrade during storage.

III. DISCUSSION

The Petitioner requests actions by the NRC based on the contention that the unloading procedure developed by the licensee is inadequate and, therefore, the licensee has violated various NRC regulations related to having the ability to test and maintain systems and components, protecting the spent fuel cladding from degradation, designing storage systems to allow ready retrieval of spent fuel for further processing or disposal, and designing ISFSIs to facilitate decommissioning activities. In addition, the Petitioner alleges that the licensee violated NRC regulations pertaining to the submittal of complete and accurate information regarding maintenance and unloading issues associated with the TN-40 cask.

Item 1. Suspend SNM-2506

On the basis of the contention that the licensee's unloading procedure is inadequate, and, therefore, that the licensee is in violation of NRC regulations such as 10 CFR 72.122 and 10 CFR 72.130, the Petitioner requests that Materials License No. SNM-2506 be suspended for cause, in accordance with 10 CFR 50.100, until such time as the significant issues in the

unloading process have been resolved and the unloading process has been demonstrated under the scrutiny of an independent third-party review.[2]

As previously stated, the NRC staff has reviewed the licensee's procedure for unloading a TN-40 cask at Prairie Island. The review, including verification that the licensee's unloading procedure was revised to address deficiencies found by the NRC inspectors, is documented in NRC Inspection Report 50-282/95002; 50-306/95002; 72-10/95002(DRP). Reasonable confidence that the licensee could, if necessary, safely unload a TN-40 cask is supported by the findings from the NRC inspection. The findings of subsequent evaluations performed by the NRC staff as part of the activities associated with the dry-cask-storage action plan and the review of the Petition filed by the Prairie Island Indian Community confirmed the adequacy of the licensee's procedure for unloading a cask. The licensee is required to maintain the adequacy of the unloading procedure through programs required by NRC regulations, facility licenses, and NRC-approved quality assurance programs. Additional bases for the staff's findings regarding the cited regulatory requirements are discussed in the sections that follow. The NRC staff has determined that the findings discussed in the subsequent sections of this decision adequately address the Petitioner's claims regarding the licensee's compliance with the regulatory requirements pertaining to retrievability of spent fuel, maintenance of ISFSI systems, and

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[2] The Petitioners request that Materials License No. SNM-2506 be suspended for cause in accordance with 10 CFR 50.100. Provisions for the modification, revocation, or suspension of the licenses for ISFSI facilities are contained in 10 CFR 72.60. The possible reasons for suspending licenses for ISFSIs in accordance with 10 CFR 72.60 are similar to the corresponding reasons for suspending licenses for production and utilization facilities in accordance with 10 CFR 50.100.

decommissioning. The Petitioner's request to suspend Materials License No. SNM-2506 is, therefore, denied.

Regarding a third-party review, the NRC staff's concern about the quality of licensees' unloading procedures led NRC to include the issue in the dry-cask-storage action plan. The action plan served as a framework for identifying and resolving various technical and administrative issues related to the use of dry-storage casks. The previously-mentioned actions taken by the NRC staff and licensees adequately resolved the issues pertaining to cask unloading procedures. In the specific case of the unloading procedure at Prairie Island, the licensee revised the procedure to address the problems raised by the staff during its inspection. On the basis of the actions it has already taken, the NRC staff does not believe that requiring additional demonstration of the procedures or review of the licensee's procedures by an independent third party is warranted.

Item 2. Determine that the licensee violated 10 CFR 72.122(f)

The Petitioner requests that the NRC determine that the licensee violated 10 CFR 72.122(f) by using a cask design that may require periodic seal maintenance or seal replacement that would necessitate returning the cask to the spent fuel pool. The Petitioner asserts that these casks cannot be placed back into the pool for the licensee to perform these functions, due to unresolved problems with fuel degradation during storage, flash steam, thermal shock, and the resulting potential for radiation dispersion. The Petitioner states that such a condition is in violation of the requirements that systems and components that are important to safety must be designed to permit inspection, maintenance, and testing.

The fact that the TN-40 cask design uses metallic seals to maintain the helium atmosphere within the cask was thoroughly reviewed during the licensing of the Prairie Island ISFSI as well as during staff reviews of similar casks designed by Transnuclear Inc., such as the TN-24 cask, which has been certified as an acceptable cask for use under the general licensing provisions of Subpart K of 10 CFR Part 72, and the TN-32 cask, which has had an associated topical report approved by the NRC staff for referencing in site-specific licensing applications. The seal design and related pressure-monitoring system were found to provide the necessary confidence that the inert atmosphere would be maintained and thereby prevent degradation of the fuel cladding during storage.

If it were necessary to repair or replace the metallic seals, the licensee would use the unloading procedure or a similar procedure to control the return of a TN-40 cask to the spent fuel pool. As will be discussed in more detail in the following section, the staff has determined that the licensee's unloading procedure is adequate. As documented in NRC Inspection Report 50-282/95002; 50-306/95002; 72-10/95002(DRP), the NRC staff did not require demonstration of seal replacement activities but did find that those activities performed during the dry-run exercises were adequate to demonstrate that such an activity could, if necessary, be accomplished. Given the staff's finding that the licensee's procedure for returning a cask to the spent fuel pool and subsequently unloading the fuel would not cause operational safety problems and the fact that the same procedure or a similar procedure would be used to support the repair or replacement of a TN-40 cask's metallic seals, the NRC concludes that the licensee has not violated 10 CFR 72.122(f) as alleged by the Petitioner.

Item 3. Determine that the licensee violated 10 CFR 72.122(h)

The Petitioner requests that the NRC determine that the licensee violated 10 CFR 72.122(h) by using a cask that must be placed into the spent fuel pool to perform necessary maintenance and unloading procedures. The Petitioner asserts that such placement of the cask into the pool will prematurely degrade the fuel and pose operational safety problems with respect to its ultimate and necessary removal from dry-cask storage. The Petitioner states that such a condition is in violation of the requirements that spent fuel cladding either be protected against degradation that leads to gross ruptures or otherwise confined so that fuel degradation during storage will not pose operational safety problems with respect to its removal from storage.

The staff has found that the TN-40 cask can adequately maintain the inert atmosphere within the cask to prevent fuel degradation and provides for sufficient indication of the loss of the inert atmosphere using the pressure-monitoring system. Maintaining the inert atmosphere and other design requirements established for the TN-40 casks is sufficient to protect the fuel cladding during storage. In the event that the pressure-monitoring system indicates that the helium atmosphere is not being maintained within a TN-40 cask, the TS for the Prairie Island ISFSI require that the cask be returned to the spent fuel pool for replacing or repairing the seals.

The Petitioner asserts that the return of the cask to the spent fuel pool will prematurely degrade fuel and poses operational safety problems. In support of this assertion, the Petitioner enclosed, as Exhibit A to the Petition, a letter from Dr. Gail Marcus of the NRC staff, dated February 25, 1997, which responded to an inquiry made to the NRC staff by Mr. George Crocker of the Prairie Island Coalition. In the letter, Dr. Marcus makes the following statements:

(1) As part of its assessments of licensees' procedures for unloading dry storage casks, the NRC staff considers the dry-run exercises performed to verify key aspects of unloading

procedures, as well as licensees' actual experience in the loading and unloading of transportation casks, loading of storage casks, handling of spent fuel assemblies under various conditions, and performing various activities associated with reactor facilities. In the absence of actual experience in unloading spent fuel from a cask following a long period of storage, a general understanding of technical capabilities and related experiences enables the NRC staff to assess the adequacy of a licensee's procedures for unloading dry storage casks.

(2) Although the limited unloading experiences with storage casks have not involved the temperature differences between fuel and coolant that may occur if a cask was unloaded after a period of storage, engineering evaluations and experiences with transportation casks have shown that "thermal shocking" is unlikely to cause operational safety problems.

(3) Although licensees would be able to develop means to retrieve degraded fuel assemblies from a dry storage cask, the accumulated occupational dose to perform this activity may be increased from the previously mentioned estimates. Fuel reactivity for criticality considerations could increase only under very idealistic and highly unlikely disintegration patterns in the fuel. Upon detection that fuel disintegration had occurred, special measures would be developed and implemented to assure an adequate safety margin is maintained during unloading.

The statement regarding "thermal shock" is based on the fact that the licensee's unloading procedure contains precautions to slowly introduce water to the TN-40 cask and thereby minimize the thermal shock to the fuel assemblies. As explained in DD-97-18, at pp. 13-14, the NRC staff does not believe that the process of refilling a cask with water and returning it to the spent fuel pool will cause fuel degradation or operational safety problems. In DD-97-18, the staff stated:

> The Petitioners expressed concerns regarding the reaction of the cask and stored fuel assemblies to the introduction of spent fuel pool water during the execution of the unloading procedure. The unloading procedure includes the partial immersion of the TN-40 cask into the spent fuel pool, connection of hoses to the vent and drain connections, and the slow introduction of spent fuel pool water to the cask cavity and stored fuel assemblies. The procedure instructs personnel to continuously monitor the temperature and pressure instrumentation installed on the vent connection and to stop pumping water if the pressure exceeds 10 psig or the temperature exceeds 240 °F. In the staff's judgment, the cooling process imposed by these limitations on temperatures and pressures at the vent port of the cask will adequately ensure that the cooling of the cask

and spent fuel is gradual and, thereby, prevent safety problems that could hypothetically result from damage to the cask or the fuel assemblies because of stresses induced by a poorly controlled addition of cooling water from the spent fuel pool.

The Petitioner also cites a letter dated April 15, 1997, from Susan Frant Shankman of the NRC staff to Sierra Nuclear Corporation, which emphasizes that NRC regulations require that inert atmospheres be maintained within dry-storage casks in order to prevent fuel degradation during storage. The Petitioner states that the pressure-monitoring system is included in the design because the loss of helium from TN-40 casks is an anticipated event and that neither fuel degradation that may result from a loss of the helium nor the method by which the licensee would replace a damaged seal has been addressed. As previously mentioned, the NRC staff has found that the design of the TN-40 casks, including its combination of metallic seals and a pressure-monitoring system, is adequate to maintain a helium atmosphere within the cask. The helium atmosphere, in turn, has been found, when combined with other restrictions in the license for the Prairie Island ISFSI, to adequately protect against degradation of the spent fuel cladding.

Given its finding that (1) fuel integrity will be maintained during normal storage by the inert atmosphere and (2) the return of a cask to the spent fuel pool for unloading or seal maintenance would not result in fuel degradation that would result in operational safety problems, the NRC staff has not identified a violation of 10 CFR 72.122(h) at the Prairie Island ISFSI, as is claimed by the Petitioner.

Item 4. Determine that the licensee violated 10 CFR 72.122(l)

The Petitioner requests that the NRC determine that the licensee violated 10 CFR 72.122(l) by loading casks and storing them before the licensee had developed and implemented procedures adequate to safely unload and decommission the TN-40 casks.

The staff's basis for determining that the licensee has not violated the requirements of 72.122(l) for the reasons cited by the Prairie Island Indian Community was discussed in DD-97-18. As discussed in DD-97-18, normal unloading procedures do not need to incorporate contingency actions for failed fuel, provided that precautions exist to check for fuel degradation before breaching the confinement boundaries of a cask. In the unlikely event that fuel degradation has occurred during storage, the licensee would need to address the retrieval of failed fuel and implement necessary precautions related to the radioactive and fissile materials within the cask.

In support of its claim regarding potential problems in unloading a TN-40 cask, the Petitioner enclosed, as Exhibit B to the Petition, a letter from the NRC staff which asked the licensee questions about a proposed amendment to the operating license for the Prairie Island Nuclear Generating Plant.[3] The proposed and subsequently issued amendment pertained to the

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[3] The Petitioner also claims that an NRC memorandum dated April 16, 1997, that addressed a request from an NRC regional office for clarification of terms associated with dry-cask storage, is deficient in that it does not address possible problems that may be encountered during unloading of a dry-storage cask or all of the possible reasons for returning a dry-storage cask to the spent fuel pool. In that memorandum, the staff stated:

> The two basic reasons to return a cask to the spent fuel pool and unload the spent fuel assemblies are either to (1) retrieve the fuel assemblies for further processing or disposal or (2) respond to an event or condition that has potentially degraded the design requirements established for the cask.

The Petitioner claims that the memorandum failed to address two reasons to return a cask to the spent fuel pool; maintenance of the metallic seals and decommissioning of the ISFSI. These are, however, only specific examples of the general reasons given above to unload a cask. Seal maintenance is performed to respond to or prevent a condition that potentially degrades the design requirements associated with maintaining the inert atmosphere; decommissioning of the ISFSI would obviously require retrieving or transporting the fuel assemblies for further processing or disposal.

TS associated with the operability of the reactor facility's spent fuel pool special ventilation system during movement of fuel assemblies within the spent fuel pool enclosure. During its review of the proposed amendment, the NRC staff requested that the licensee submit additional information about the use of the ventilation system during the possible unloading of dry-storage casks. This request for additional information, dated July 10, 1997, is the letter cited by the Petitioner. In its response of July 29, 1997, to the staff's request for additional information, the licensee explained the relationship of the ventilation system to dry-cask activities and clarified details of the procedure for unloading a TN-40 cask. The NRC was satisfied with the licensee's response to the questions which explained that the spent fuel pool special ventilation system is not operable during the filling and venting of a cask during the unloading procedure and that cracking of spent fuel rods is not expected as a result of introducing water to the cask during the unloading procedure. Those aspects of the proposed revision to the Prairie Island TS that potentially related to dry-cask activities were subsequently approved by the NRC staff in Amendment No. 130 to Facility Operating License No. DPR-42 and Amendment No. 122 to Facility Operating License No. DPR-60.

In support of its claim regarding potential problems with removing fuel assemblies from TN-40 casks, the Petitioner enclosed, as Exhibits C and D to the Petition, letters from personnel at the Idaho National Engineering Laboratory (INEL) regarding problems with removing fuel canisters from a TN-24P cask during testing at INEL. The TN-24P cask is similar in design to the TN-40 cask used at Prairie Island. The problems were addressed in the rulemaking that added Transnuclear Inc.'s TN-24 cask to the list of NRC-certified casks. The subject comment

on the proposed rulemaking pertaining to the TN-24 cask and the NRC staff's response as published in the FEDERAL REGISTER (58 FR 51762) are provided below:

> 2. *Comment*. One commenter stated that the TN-24 cask is seriously flawed. Test and operation at Idaho showed the TN-24 storage sleeves to be subject to warpage after only a few years of storage. A fuel assembly became stuck in the TN-24 cask while trying to remove it. It could not be removed and it was forced back into the cask.
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> *Response*. The NRC discussed this issue with personnel at INEL who worked on the tests of the TN-24 cask and other casks. These individuals said that a canister of consolidated fuel, not a fuel assembly, got stuck in the TN-24 cask. The canister was larger than a fuel assembly and, unlike a fuel assembly, it had many screws and nuts protruding from it. The storage sleeves in the TN-24 Basket did not warp. The individuals suspect that one of the screws or nuts got caught on an interlocking plate in the basket of the TN-24 cask. The Certificate of Compliance does not allow the storage of consolidated fuel in canisters. Additionally, the basket of the TN-24 tested at INEL is slightly different from the one which Transnuclear plans to use in its certified cask.

The license issued for the Prairie Island ISFSI also prohibits the storage of consolidated fuel assemblies and, therefore, the problems with unloading experienced during the testing at INEL are not expected to occur when the licensee unloads its TN-40 casks.

The Petitioner asserts that additional evidence that dry-storage casks cannot be unloaded is provided by the experiences of the licensee for the ISFSI at the Palisades Nuclear Plant. As discussed in detail in NRC Inspection Report 50-255/96201(NRR) dated September 4, 1997, the NRC staff has found that the Palisades dry-cask unloading procedure, along with supporting operating, maintenance, radiation protection, and administrative procedures, contains adequate directions for the safe unloading of VSC-24 storage casks.[4]

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[4] The NRC staff has also found that the subject cask can safely be used for storing spent fuel despite the licensee's announced plans for unloading the cask after it discovered (from radiographs for a weld in a VSC-24 multi-assembly sealed basket) indications of possible

Much of the argument pertaining to the inadequacy of the licensee's unloading procedure that is presented by the Petitioner centers on the lack of an actual example of the unloading of a dry-storage cask at a commercial reactor facility. As discussed in DD-97-18, the NRC staff's judgment that there is reasonable assurance that the TN-40 casks can be safely unloaded comes from a variety of experiences related to the use and storage of radioactive materials. Among these experiences are the dry-run exercises that were performed to verify key aspects of unloading procedures for the TN-40 cask; related research sponsored by the commercial nuclear industry, the U.S. Department of Energy, and the NRC; actual loading and unloading of transportation casks; loading of storage casks; handling of spent fuel assemblies under various conditions; and performing relevant maintenance and engineering activities associated with reactor facilities.

The NRC staff has reviewed the information submitted by the Petitioner and has determined that the licensee could, if necessary, unload a TN-40 cask and has not, therefore, identified a violation of 10 CFR 72.122(l).

Item 5. Determine that the licensee violated 10 CFR 72.130

The Petitioner requests that the NRC determine that the licensee violated 10 CFR 72.130 by using the TN-40 cask and failing to make provisions to successfully accomplish the removal of radioactive waste and contaminated materials at the time the independent spent fuel storage installation (ISFSI) is permanently decommissioned. The basis for this assertion is that TN-40 casks cannot be safely unloaded. As discussed in previous sections and as discussed in

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defects. The licensee subsequently announced that it was deferring the unloading of the cask pending the availability of a cask that supports both storage and transport functions.

DD-96-21, the NRC staff has found that spent nuclear fuel can be safely unloaded from the TN-40 casks, whether such unloading is necessary in response to an event or in support of decommissioning the ISFSI.

In order to support the decommissioning of the Prairie Island ISFSI, the licensee may need to transfer the spent fuel stored in TN-40 casks to another cask for transfer of the fuel assemblies to another location for storage or disposal. In order to transfer the spent fuel assemblies, the licensee will need to either return the casks to the spent fuel pool or use a yet-to-be-approved system that transfers fuel assemblies under dry conditions. In the event that the spent fuel pool is used to transfer fuel assemblies, the unloading procedure or a similar procedure would control the return of the fuel from the ISFSI to the spent fuel pool. Given that the staff has determined that the unloading procedure is adequate to control the unloading of fuel assemblies from a TN-40 cask to the spent fuel pool, the staff has no reason to (1) find that its use as part of the decommissioning of the ISFSI facility raises unique questions regarding compliance with 10 CFR 72.130 or (2) otherwise change the conclusion it reached during the licensing of the ISFSI at Prairie Island regarding the viability of decommissioning the facility.

Item 6. Determine that the licensee violated 10 CFR 72.11

The Petitioner requests that the NRC determine that the licensee violated 10 CFR 72.11 by failing to provide and include complete and accurate material information regarding maintenance and unloading of TN-40 casks in the application for the Prairie Island ISFSI and in subsequent submittals on the subject of cask maintenance and unloading. In support of this contention, the Petitioner references the letter from G. Marcus dated February 25, 1997, (Exhibit A to the Petition), which explained the NRC action plan for dry-cask storage and its item related

to oversimplified descriptions of the process for unloading fuel from casks as the reverse of loading casks. In that letter to Mr. Crocker of the Prairie Island Coalition, Dr. Marcus states:

> Some SARs do state that unloading is basically the reverse of loading and this statement, in a general sense, is true. However, such statements may tend to over-simplify matters because they do not reflect that the unloading process introduces different conditions and complications compared to the loading process. In the NRC action plan for dry cask storage and related statements made by the NRC staff, including those by Mr. Kugler, the staff was emphasizing that licensees need to identify the conditions and complications that are associated with the unloading process and ensure that unloading procedures address those concerns. The unloading procedure for the dry storage casks at Prairie Island was inspected by the NRC staff and, following minor revisions, was found to provide adequate guidance to control the unloading process. A copy of NRC Inspection Report 50-282/95002; 50-306/95002; 72-10/95002 is provided as Enclosure 2.

The petitioner asserts that upon receipt of information related to unloading issues, the licensee has not taken steps to correct its unloading problem and has refused to address these continuing problems.

As stated in DD-97-18, in response to a similar request made by the Prairie Island Indian Community, the safety analysis report (SAR) for the Prairie Island ISFSI and other docketed correspondence do state that a TN-40 cask would be unloaded using a procedure that is basically the reverse of the procedure used to load the cask. Although this statement, in a general sense, is true, the NRC staff has expressed its concerns that such statements may oversimplify the description of the unloading activity. For this reason, the NRC staff added an item related to unloading procedures to its dry-cask-storage action plan to ensure that actual unloading procedures did not reflect such an oversimplified representation. Additional inspections, revised staff guidance, and communications with the nuclear industry were conducted under the staff's action plan related to this issue. The staff inspected the unloading

procedures at Prairie Island and found that they provided adequate guidance to control the unloading process.

The staff's review of the information originally submitted by the licensee shows that the information pertaining to cask unloading was complete and accurate given the staff's expectations and the information provided by other licensees in applications submitted in the same time period. It should be noted that material submitted by the licensee for the ISFSI at Prairie Island includes copies of the loading and unloading procedures and those procedures have been available for public review. Regarding the information given to the NRC pertaining to maintenance of the TN-40 casks, which the Petitioner also claims was incomplete and inaccurate, the NRC staff acknowledged in its safety evaluation report that maintenance activities were discussed only briefly in the submittals supporting the ISFSI at Prairie Island. The level of information submitted, however, was generally consistent with the level of information in other applications of that same time period and was sufficient to meet the staff's expectations for the review process. The NRC staff has not identified a violation of 10 CFR 72.11 pertaining to the information provided by the licensee as is claimed by the Petitioner.

Item 7. Determine that the licensee violated 10 CFR 72.12

The Petitioner requests that the NRC determine that the licensee violated 10 CFR 72.12 by deliberately and knowingly submitting incomplete and inaccurate material information regarding maintenance and unloading of TN-40 casks in the application for the Prairie Island ISFSI and in subsequent submittals on cask maintenance and unloading issues. The Petitioner states that the licensee has continually insisted that it can unload TN-40 casks and that the licensee has referenced inapplicable studies to support its position.

As mentioned in the response to the preceding item, the staff believes that the information submitted by the licensee is consistent with the information in other applications of that same time period and was sufficient to meet the staff's expectations for the review process. Given that the NRC staff has found that the licensee could, if necessary, unload a cask, the staff does not agree this statement when made by the licensee was deliberately incomplete or inaccurate information in any material respect. The NRC staff has not identified a violation of 10 CFR 72.12 pertaining to the information provided by the licensee as is claimed by the Petitioner.

Item 8. Require that the licensee pay a substantial penalty

The Petitioner requests that the NRC require the licensee to pay a substantial penalty for each cask loaded in violation of NRC regulations. Given that the staff has not identified violations of NRC regulations as alleged by the Petitioner, the staff has no basis to issue a notice of violation and proposed civil penalty.

Item 9. Administer other sanctions deemed necessary and appropriate

The Petitioner requests that the NRC administer such other sanctions for the alleged violations of NRC regulations as the NRC deems necessary and appropriate. Given that the staff has not identified violations of NRC regulations as alleged by the Petitioner, there is no basis for sanctions against the licensee.

Item 10. Provide Petitioner the opportunity to review procedures

The Petitioner requests that it be given the opportunity to participate in a public review of maintenance, unloading, and decommissioning processes and procedures in question and an opportunity to comment on draft findings after investigation by the NRC.

Regarding the unloading procedure, the licensee has provided the NRC with the unloading procedure, including Revision 2, dated November 8, 1996, for placement into the public record, and the Petitioner has been supplied with a copy of the procedure. Accordingly, the Petitioner has had the opportunity to review a recent revision of the unloading procedure and may continue to review other documents in the public domain. As previously discussed in this decision, the NRC staff has performed various technical reviews and inspections related to the issues raised by the Petitioner. These reviews and inspections have provided the bases of the NRC staff's findings that the licensee has complied with the applicable regulatory requirements. Given that no violations or previously unidentified regulatory issues have been raised by the Petitioner, the NRC staff sees no reason to undertake additional reviews of the maintenance, unloading, and decommissioning processes and procedures or to initiate public hearings.

Regarding the Petitioner's request for an opportunity to comment on draft findings after the requested NRC "investigation," the request is rendered moot by the NRC staff's determination that additional reviews or "investigations" are unnecessary. In addition, the NRC staff does not, as a matter of general policy, release draft or predecisional information to its licensees or to the public for review and comment.

Item 11. Order modification of the licensee's ISFSI Technical Specifications

The Petitioner requests that the NRC issue an order to modify the TS for the Prairie Island ISFSI to ensure a demonstrated ability to, in fact, safely maintain, unload, and decommission TN-40 casks.

Although the TS for the Prairie Island ISFSI require that TN-40 casks be unloaded if certain events or conditions defined in the TS are satisfied, the TS do not include specific

requirements for the unloading process. Likewise the TS do not detail maintenance or decommissioning procedures or processes. The content of the TS for the Prairie Island ISFSI is typical in this respect since neither 10 CFR 72.44 nor the associated regulatory guidance documents specify that technical specifications should include special requirements for these procedures.[5] Instead, the functional and operating limits, limiting conditions, administrative controls, and other requirements included in the TS for the Prairie Island ISFSI are intended to maintain the cask and stored spent fuel assemblies within the limits established for safe operation during storage within the ISFSI and activities such as loading and unloading of the casks. For example, TS 2.3 limits the allowable lifting heights during movement of the cask from the ISFSI and TS 3/4.2 requires a measurement of the boron concentration of the water in the spent fuel pool before water is introduced to the cask during the unloading process.

As the staff explained in DD-97-18, the absence of specific requirements in the TS to control the unloading process does not diminish the importance that the NRC staff places on this activity. Likewise, specific requirements for performing routine maintenance activities and possible activities during decommissioning, although important, are not prescribed in the TS. The TS do, however, contain requirements for monitoring the integrity of the metallic seals and actions to be taken in the event that the pressure-monitoring system indicates a potential loss of the inert atmosphere within the cask. The NRC staff believes that other regulatory requirements

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[5] Recent NRC staff guidance pertaining to the appropriate content of technical specifications is provided in NUREG-1536, "Standard Review Plan for Dry Cask Storage Systems," published in January 1997. Similar guidance is provided by NRC Regulatory Guide 3.61, "Standard Format and Content for a Topical Safety Analysis Report for a Spent Fuel Dry Storage Cask," issued in February 1989, and NRC Regulatory Guide 3.48, "Standard Format and Content for the Safety Analysis Report for an Independent Spent Fuel Storage Installation (Dry Storage)," issued in October 1981.

offer an equivalent level of protection to the Petitioner's request to include specific requirements in the TS to control the maintenance and unloading of TN-40 casks and the eventual decommissioning of the ISFSI. The administrative controls in the TS for the Prairie Island ISFSI require that the associated procedures be prepared, reviewed, and maintained in accordance with the requirements of the Prairie Island Nuclear Generating Plant facility operating licenses and associated TS. In addition, under existing NRC requirements, the licensee must adequately implement procedures to control loading, maintaining, and unloading of dry-storage casks (see 10 CFR 72.122, 10 CFR 72.150, and 10 CFR 72.152). For example, as indicated in the NRC inspection documented in Inspection Report 50-282/95002; 50-306/95002; 72-10/95002(DRP), and the resulting notice of violation to the licensee, NRC's requirements in Criterion V of Appendix B to 10 CFR Part 50 already require the incorporation of appropriate steps and precautions into the original procedure developed to control unloading of a TN-40 cask. Thus, as demonstrated by the example, no changes to the TS or the SAR are needed to ensure that enforceable requirements for operating controls and limits are in place to address the unloading of a cask.

Given that the unloading procedure or a similar procedure can be used during maintenance activities for the repair or replacement of seals or during the decommissioning of the Prairie Island ISFSI, no changes to the TS or the SAR are needed to ensure that enforceable requirements for operating controls and limits are in place to address the unloading of the cask for these specific purposes.

Item 12. If necessary, order the licensee to build a facility for dry transfer of spent fuel assemblies

The Petitioner requests that the NRC review the licensee's processes and procedures for maintenance, unloading, and decommissioning, and if the licensee does not possess a capability to unload casks, order the licensee to build a "hot shop" for air unloading of casks and transfer of the fuel. Given that the staff has performed the level of reviews and inspections it feels are warranted and has found that the licensee could safely unload a TN-40 cask using the spent fuel pool, it is not necessary to order the licensee to build a facility to support the transfer of fuel assemblies under dry conditions.[6]

IV. CONCLUSION

For the reasons described above, the NRC has determined that no adequate basis exists for granting the Petitioner's request for suspension of Northern States Power Company's license for dry-cask storage of spent nuclear fuel at Prairie Island or for taking the other actions requested by the Petitioner.

A copy of this decision will be filed with the Secretary of the Commission for the Commission to review in accordance with 10 CFR 2.206(c).

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[6] However, as noted in response to Item 5, the licensee may elect to transfer fuel assemblies under dry conditions if a dry-transfer system is developed and receives appropriate NRC approval.

As provided by this regulation, this decision will constitute the final action of the Commission 25 days after issuance, unless the Commission, on its own motion, institutes a review of the decision within that time.

Dated at Rockville, Maryland, this 11th day of February 1998.

FOR THE NUCLEAR REGULATORY COMMISSION

Frank J. Miraglia

Frank J. Miraglia, Acting Director
Office of Nuclear Reactor Regulation