

August 28, 2007

Mr. Stewart B. Minahan  
Vice President-Nuclear and CNO  
Nebraska Public Power District  
72676 648A Avenue  
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION - ENVIRONMENTAL ASSESSMENT AND  
FINDING OF NO SIGNIFICANT IMPACT RE: ONSITE SPENT FUEL  
STORAGE EXPANSION (TAC NO. MD3349)

Dear Mr. Minahan:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for amendment dated October 17, 2006, as supplemented by letters dated February 7, April 17, May 4, and July 26, 2007. The proposed amendment would revise Technical Specification (TS) 4.3.1.1.c, "Criticality," by adding a new nominal center-to-center distance between fuel assemblies for two new storage racks, and revise TS 4.3.3, "Capacity," by increasing the capacity of the spent fuel storage pool from 2366 assemblies to 2651 assemblies.

The assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

**/RA/**

Carl F. Lyon, Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosure: Environmental Assessment

cc w/encl: See next page

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**ADAMS Accession No: ML072130005**

\*\*NLO w/comments

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NAME	FLyon	JBurkhardt	EBenner*	APH**	THiltz
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Cooper Nuclear Station

cc:

Mr. Ronald D. Asche  
President and Chief Executive Officer  
Nebraska Public Power District  
1414 15<sup>th</sup> Street  
Columbus, NE 68601

Mr. Gene Mace  
Nuclear Asset Manager  
Nebraska Public Power District  
P.O. Box 98  
Brownville, NE 68321

Mr. John C. McClure  
Vice President and General Counsel  
Nebraska Public Power District  
P.O. Box 499  
Columbus, NE 68602-0499

Mr. David Van Der Kamp  
Licensing Manager  
Nebraska Public Power District  
P.O. Box 98  
Brownville, NE 68321

Mr. Michael J. Linder, Director  
Nebraska Department of Environmental  
Quality  
P.O. Box 98922  
Lincoln, NE 68509-8922

Chairman  
Nemaha County Board of Commissioners  
Nemaha County Courthouse  
1824 N Street  
Auburn, NE 68305

Ms. Julia Schmitt, Manager  
Radiation Control Program  
Nebraska Health & Human Services R & L  
Public Health Assurance  
301 Centennial Mall, South  
P.O. Box 95007  
Lincoln, NE 68509-5007

Mr. H. Floyd Gilzow  
Deputy Director for Policy  
Missouri Department of Natural Resources  
P.O. Box 176  
Jefferson City, MO 65102-0176

Senior Resident Inspector  
U.S. Nuclear Regulatory Commission  
P.O. Box 218  
Brownville, NE 68321

Regional Administrator, Region IV  
U.S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 400  
Arlington, TX 76011

Director, Missouri State Emergency  
Management Agency  
P.O. Box 116  
Jefferson City, MO 65102-0116

Chief, Radiation and Asbestos  
Control Section  
Kansas Department of Health  
and Environment  
Bureau of Air and Radiation  
1000 SW Jackson  
Suite 310  
Topeka, KS 66612-1366

Ms. Melanie Rasmussen  
Radiation Control Program Director  
Bureau of Radiological Health  
Iowa Department of Public Health  
Lucas State Office Building, 5th Floor  
321 East 12th Street  
Des Moines, IA 50319

Mr. Daniel K. McGhee  
Bureau of Radiological Health  
Iowa Department of Public Health  
Lucas State Office Building, 5th Floor  
321 East 12th Street  
Des Moines, IA 50319

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Cooper Nuclear Station

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cc:

Mr. Keith G. Henke, Planner  
Division of Community and Public Health  
Office of Emergency Coordination  
930 Wildwood P.O. Box 570  
Jefferson City, MO 65102

Mr. John F. McCann, Director  
Licensing, Entergy Nuclear Northeast  
Entergy Nuclear Operations, Inc.  
440 Hamilton Avenue  
White Plains, NY 10601-1813

Mr. Paul V. Fleming, Director of Nuclear  
Safety Assurance  
Nebraska Public Power District  
P.O. Box 98  
Brownville, NE 68321

August 2007

UNITED STATES NUCLEAR REGULATORY COMMISSION

NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

COOPER NUCLEAR STATION

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of an amendment to Facility Operating License No. DPR-46, issued to Nebraska Public Power District (NPPD, the licensee), for operation of the Cooper Nuclear Power Station (CNS) located in Nemaha County, Nebraska. Therefore, as specified in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 51.21, the NRC is issuing this environmental assessment and finding of no significant impact.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The proposed action is in response to the licensee's application dated October 17, 2006, as supplemented by letters dated February 7, April 17, May 4, and July 26, 2007, requesting an amendment to the operating license for CNS to increase the storage capacity of its spent fuel pool (SFP) to maintain the capability to fully offload the core from the reactor as the unit approaches the end of its operating license. To achieve this goal, the licensee plans to install two additional high-density spent fuel racks into the SFP. Existing spent fuel racks will remain in the pool in their current configuration. The proposed additional racks will have a closer assembly-to-assembly spacing to increase fuel storage capacity. The number of fuel

assemblies that can be stored in the SFP would be increased from 2366 assemblies to 2651 assemblies (an increase of 285 assemblies).

The Need for the Proposed Action:

An increase in spent fuel storage capacity is needed to maintain the capability for a full-core offload and to allow CNS to operate at full power until the next refueling outage. Loss of full-core offload capability occurred when the spent fuel was discharged to the SFP following Cycle 22 in January 2005. The licensee plans to install one of the additional high-density storage racks (with the capacity to store 117 fuel assemblies) immediately following issuance of the proposed amendment, with the second high-density storage rack (with the capacity to store 168 fuel assemblies) to be installed later if necessary, while keeping the existing racks in place. The additional capacity will ensure the capability of a full-core offload as the unit approaches the end of Cycle 25, at which point it will receive new fuel for Cycle 26 during the summer of 2009.

Environmental Impacts of the Proposed Action:

The NRC has completed its safety evaluation of the proposed action and concludes that the proposed addition of two new storage racks to the SFP is acceptable. The details of the staff's safety evaluation will be provided in the license amendment that will be issued as part of the letter to the licensee approving the license amendment.

The staff has reviewed the licensee's plan for the expanded fuel storage capacity with respect to the radiological impact. The specifics of this review are presented below:

1. Radioactive Wastes

CNS uses waste treatment systems designed to collect and process gaseous, liquid, and solid waste that might contain radioactive material in a safe and controlled manner so that

the discharges are in accordance with the regulatory standards of 10 CFR Part 20, and Appendix I to 10 CFR Part 50.

2. Solid Radioactive Wastes

The NRC staff reviewed the impact of the expanded fuel storage capacity on the production and release of radioactive waste during normal operations. The level of radioactive material in the pool water and the degree of water clarity determines the amount of solid waste produced by pool purification system resins. The licensee expects that during the fuel pool expansion work, small amounts of additional resins may be generated. This additional waste will be generated on a one-time basis. During normal operations, the licensee does not expect there to be a significant increase in the amount of solid radioactive wastes. Overall, the staff concludes that during routine operations, there will be no significant increase in the volume of solid radioactive wastes generated as a result of the proposed action.

3. Gaseous Radioactive Effluents

Radioactive gases that evolve from the surface of the pool water contribute to the plant's gaseous effluents. However, the levels of gaseous and particulate radioactivity in the pool water and in the area around the SFP are dominated by the most recent reactor offload to the SFP, not the older cooled fuel in the pool. Therefore, the storage of additional spent fuel assemblies resulting from the proposed action will have a minimal contribution to the gaseous effluents. The licensee has area radiation monitors in the immediate vicinity of the SFP, which monitor ambient airborne particulate and iodine radioactivity, and additional radiation monitors that monitor gaseous discharges into the environment. This radiation monitoring is performed to ensure continued compliance with the regulatory dose limits for the workers and members of the public. Overall, the staff concludes that during routine operations, there will be no

significant increase in the amount of gaseous radiological effluents released into the area around the SFP and into the environment as a result of the proposed action.

4. Liquid Radiological Effluents

The number of stored spent fuel assemblies does not directly affect the release of radioactive liquids from the plant. The contribution from the stored fuel assemblies of radioactive materials in the SFP water is minor relative to other sources of activity, such as the reactor coolant system and its associated sub-systems. The volume of SFP water processed for discharge is independent of the quantity of stored spent fuel assemblies. Therefore, the installation of the new fuel racks would not be expected to increase the amount of radioactive liquid wastes generated at the CNS. Overall, the staff concludes that during routine operations, there will be no significant increase in the amount of liquid radiological effluents released into the environment as a result of the proposed action.

5. Occupational Radiation Dose

During normal operations, personnel working in the fuel storage area are exposed to low levels of radiation from the SFP. Operating experience across the nuclear industry has shown that area dose rates originate primarily from radionuclides in the pool water, not the fuel itself, which is well shielded. The radiological conditions in the SFP area are typically dominated by the most recent discharge of spent fuel. The radioactivity inventory available for release into the general area from the older spent fuel, including the fuel from the expanded storage, is expected to be insignificant in comparison to freshly discharged fuel. During refueling and other fuel movement activities, pool water concentrations of radionuclides might be expected to increase to a small degree. However, the installation of the new fuel storage racks is not expected to cause any detectable increase in airborne activities or changes in the general area dose rates which might impact personnel working in the area.



All operations involved in the installation of the new fuel racks and the removal of any stored equipment or material from the SFP will be governed by plant procedures. The licensee's procedures incorporate the principle of keeping doses as low as reasonably achievable (ALARA), as required by NRC regulations.

The licensee does not expect to use underwater divers for the installation of the new fuel racks. However, in the event that diving operations are needed, the licensee is prepared to use specialized procedures and underwater radiation monitoring equipment to provide constant oversight and control to ensure the health and safety of the diver.

On the basis of our review of the CNS proposed expansion of the SFP storage capacity, the NRC staff concludes that the SFP work can be performed in a manner that will ensure that doses to the workers and the public, as well as the discharge of radioactive solid, gaseous, and liquid into the environment will be maintained within NRC regulations and standards. Therefore, there are no significant radiological impacts associated with the proposed action.

#### 6. Postulated Accident Considerations

The proposed modification increases the SFP storage capacity, but it does not change the method for handling spent fuel assemblies.

The proposed expansion of the SFP will not affect any of the assumptions or inputs used in evaluating the dose consequences of a fuel handling accident and, therefore, will not result in an increase in the doses from the previously analyzed postulated fuel handling accident. In summary, the staff has evaluated the proposed action and concludes that it does not increase the probability or consequences of a postulated accident.

#### 7. Non-radiological Impact

The proposed amendment to the current operating license of CNS does not modify land use at the site; no new facilities or laydown areas are needed to support the rerack or operation

after rerack; therefore, the proposed amendment does not affect land use or land with historical or archeological sites.

With regard to potential non-radiological environmental impacts, the proposed action does not result in any significant changes to land use or water use, or result in any significant changes to the quality or quantity of effluents. The proposed action does not affect non-radiological plant effluents, and no changes to the National Pollution Discharge Elimination System permit are needed. No effects on the aquatic or terrestrial habitat in the vicinity of the plant, or to endangered or threatened species, or to the habitats of endangered or threatened species are expected.

The proposed action will not change the method of generating electricity or the method of handling any influents from the environment or non-radiological effluents to the environment. Therefore, no changes or different types of non-radiological environmental impacts are expected as a result of the proposed action.

#### 8. Summary

The proposed action will not significantly increase the probability or consequences of accidents, no changes are being made in the types of radioactive effluents that may be released offsite, and there is no significant increase in the allowable individual or cumulative occupational or public exposure. Accordingly, the staff concludes that there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential non-radiological impacts, the proposed action involves features located entirely within the restricted area, as defined in 10 CFR Part 20. It does not affect non-radiological plant effluents and is not expected to have any other environmental impact. Accordingly, the staff concludes that there are no significant non-radiological environmental impacts associated with the proposed action.

Environmental Impacts of Alternatives to the Proposed Action:

1. Shipping Fuel to a Permanent Fuel Storage/Disposal Facility

Shipping of spent fuel to a high-level radioactive storage facility is an alternative to increasing onsite spent fuel storage capacity. The Department of Energy (DOE) has identified Yucca Mountain, Nevada, as the single candidate site for characterization as a potential geologic repository for high-level radioactive waste. However, this repository is not expected to begin receiving spent fuel until approximately 2025, provided that the DOE receives a license from the NRC. DOE plans to submit its license application for the proposed Yucca Mountain, Nevada, repository to the NRC in June 2008. Therefore, shipping spent fuel to the DOE repository is not considered an alternative to increased onsite spent fuel storage capacity at this time.

2. Shipping Fuel to a Reprocessing Facility

Reprocessing of spent fuel from CNS is not a viable alternative since there are no operating commercial reprocessing facilities in the United States. Therefore, spent fuel would have to be shipped to an overseas facility for reprocessing. However, this approach has never been used and would require approval by the Department of State as well as other entities. Additionally, the cost of spent fuel reprocessing is not offset by the current salvage value of the residual uranium; reprocessing would represent an added cost.

3. Shipping Fuel to Another Utility or SFP Site for Storage

The shipment of fuel to another utility's SFP for storage could provide short-term relief from the storage problem at CNS. The Nuclear Waste Policy Act of 1982 and 10 CFR Part 53, however, clearly place the responsibility for the interim storage of spent fuel with each owner or operator of a nuclear plant. SFPs at other nuclear stations have been designed with the capacity to accommodate each of those units and, therefore, transferring spent fuel from CNS

to these pools would eventually create fuel storage capacity problems at those stations. The shipment of fuel to another site is not an acceptable alternative because of increased fuel handling risks and additional occupational radiation exposure, as well as the fact that no additional storage capacity would be created.

4. Alternative Creation of Additional Storage Capacity

Alternative technologies that would create additional storage capacity include rod consolidation, new SFP construction, dry cask storage, and modular vault dry storage. Rod consolidation involves disassembling the spent fuel assemblies and storing the fuel rods from two or more assemblies in a stainless steel canister that can be stored in the spent fuel racks. Industry experience with rod consolidation is currently limited, primarily due to concerns for potential gap activity release due to rod breakage, the potential for increased fuel cladding corrosion due to some of the protective oxide layers being scraped off, and concern that the prolonged consolidation activity could interfere with ongoing plant operations.

Dry cask storage is a method of transferring spent fuel, after storage in the pool for several years, to high-capacity casks with passive-heat dissipation features. After loading, the casks are stored outdoors on a seismically qualified concrete pad. The casks provide housing for the spent fuel in shielded steel cylinders in a horizontal configuration within a reinforced concrete vault. The concrete vault provides missile and earthquake protection and radiation shielding. Though CNS is in the process of evaluating dry cask storage as a long-term storage option, it is not an alternative for resolving the current need for full-core offload capability due to the long lead time for an NRC license, time requirements for site preparation and construction, and the limited production of the dry casks used for storage. For these reasons, dry cask storage is not the licensee's preferred short-term method of storage.

5. Reduction of Spent Fuel Generation

Generally, improved usage of the fuel and/or operation at a reduced power level would be an alternative that would decrease the amount of fuel being stored in the pool and thus increase the amount of time before full-core offload capacity is lost. With extended burnup of fuel assemblies, the fuel cycle would be extended and fewer offloads would be necessary. This is not an alternative for resolving the loss of full-core offload capacity that occurred as a result of the CNS refueling outage in January of 2005, because the spent fuel transferred to the pool for storage during this outage eliminated the licensee's ability to conduct a full-core offload. Operating the plant at a reduced power level would not make effective use of available resources, and would cause unnecessary economic hardship on the licensee and its customers. Therefore, reducing the amount of spent fuel generated by increasing burnup further or reducing power is not considered a practical alternative.

6. The No-Action Alternative

As an alternative to the proposed action, the staff considered denial of the proposed action. Denial of the amendment request would result in no change in current environmental impacts. The environmental impacts of the proposed amendment and this alternative are similar.

Alternative Use of Resources:

This action does not involve the use of any resources not previously considered in the Cooper Nuclear Station Final Environmental Impact Statement dated February 1973.

Agencies and Persons Contacted:

In accordance with its stated policy, on August 27, 2007, the staff consulted with the Nebraska State official, Ms. J. Schmitt of the Nebraska Department of HHS Regulation and

Licensure, Office of Radiological Health, regarding the environmental impact of the proposed action. The State official had no comments.

#### FINDING OF NO SIGNIFICANT IMPACT

On the basis of the environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the Commission has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's letter dated October 17, 2006, as supplemented by letters dated February 7, April 17, May 4, and July 26, 2007. Documents may be examined, and/or copied for a fee, at the NRC's Public Document Room (PDR), located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland. Publicly available records will be accessible electronically from the Agencywide Document Access and Management System (ADAMS) Public Electronic Reading Room on the Internet at the NRC Website: <http://www.nrc.gov/reading-rm/adams.html>. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or send an email to [pdr@nrc.gov](mailto:pdr@nrc.gov).

Dated at Rockville, Maryland, this 28th day of August, 2007.

FOR THE NUCLEAR REGULATORY COMMISSION

**/RA/**

Carl F. Lyon, Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation