March 5, 2007

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

SUBJECT: COOPER NUCLEAR STATION - REQUEST FOR ADDITIONAL INFORMATION RE: LICENSE AMENDMENT REQUEST - ONSITE SPENT FUEL STORAGE EXPANSION (TAC NO. MD3349)

Dear Mr. Minahan:

By application dated October 17, 2006, Nebraska Public Power District (NPPD, the licensee) requested the U.S. Nuclear Regulatory Commission (NRC) staff approval of an amendment to the Cooper Nuclear Station technical specifications to increase the capacity of the spent fuel storage pool.

The NRC staff has reviewed the information provided in your submittal and determined that additional information is required in order to complete its review. Questions in the enclosed request for additional information (RAI) were discussed in telephone calls with Mr. R. Rogers, et al., of your staff on December 7, 2006, and February 15 and 21, 2007. During a discussion with Mr. Rogers on February 27, 2007, it was agreed that NPPD would provide a response by April 10, 2007, to this RAI.

The NRC staff considers that timely responses to RAIs help ensure sufficient time is available for staff review and contribute toward the NRC's goal of efficient and effective use of staff resources. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-2296.

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: Request for Additional Information

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

RELATED TO ONSITE SPENT FUEL STORAGE EXPANSION

COOPER NUCLEAR STATION

DOCKET NO. 50-298

I. The following questions are provided from the Health Physics Branch (IHPB):

1. In Section 9.4 of the Holtec Report, you state that the calculated dose rate adjacent to the new fuel racks (if they are completely filled with freshly discharged fuel) would be unacceptably high.

   1-a. Provide the current radiation dose rates for those accessible areas adjacent to the area (including any accessible areas below the spent fuel pool (SFP)) where the new fuel racks will be installed.

   1-b. For these same areas, provide the calculated dose rates from the proposed new racks (1) if the new racks are completely filled with freshly discharged fuel and (2) if the outer rows of the new racks are loaded with fuel, which has decayed for at least 5 years.

   1-c. Provide the number of outer rows, which will be filled with aged fuel to ensure that the dose rates in potentially-occupied areas adjacent to the SFP do not exceed the current radiation dose rates for these areas.

2. Provide the expected maximum dose rate above the SFP.

3. Describe any radiation surveys that will be performed (from the pool rim or by divers in the pool) to map dose rates in the SFP prior to dive operations.

4. Provide a description of any sources of high radiation that may be in the SFP during diving operations for minor modification of the beam segments. Discuss what precautions (such as use of TV monitoring, additional lighting, tethers, use of physical barriers between the divers and high-radiation sources, fuel shuffling, etc.) will be used to ensure that the divers will maintain a safe distance from any high-radiation sources in the SFP. Discuss how you plan to alert divers (e.g., by use of continuous voice communication with the divers) in the event that they inadvertently enter an area of high radiation or if they exceed their predetermined dose limit while performing work in the SFP. Discuss the use of multiple dosimeters on divers who will be working in the SFP. Discuss how divers will be monitored for contamination when they exit the SFP.

5. In Section 9.4 of the Holtec Report, you state there are continuous airborne monitors for airborne activities available in the immediate vicinities of the pool. Describe how these monitors are utilized in the SFP area during the Refueling Floor Operations, including diving operations and SFP rack installations.

6. Discuss the removal, decontamination, and disposal of the storage racks for the control rod blades and the drum platform from the shipping cask storage area.

7. Discuss how the storage of the additional spent fuel assemblies in the SFP will affect the releases of radioactive gases from the SFP. Specifically address the potential increased releases of Kr-85, I-131, and tritium from the SFP.

8. Discuss how the storage of additional spent fuel assemblies in the SFP will affect the release of radioactive liquids from the plant as a result of any expected increase in the change-out frequency of the demineralizer resins for the SFP.

II. The following questions are provided from the Engineering Mechanics Branch (EEMA):

1. As noted in Section 1.3 of the Holtec Report, "[t]he existing swing bolts are used to fasten the platform to the pool floor rendering them into a fixed appurtenance to the pool slab."

   Please provide a summary of the stress analysis of the swing bolts and swing bolt anchorages to the pool slab for the loads transmitted by the Rack A fuel rack and platform. Please provide a drawing showing the anchorage pattern.

2. Section 2.1 of the Holtec Report notes that: "[a]lthough both rack modules are freestanding, and thus may slide during a seismic event, any significant membrane strains in the pool liner are prevented by the presence of the platforms. As a result, the maximum strain sustained by the liner during a seismic event is assumed to be less than the ultimate strain for the liner material (austenitic stainless steel, ultimate strain $\geq$0.38)."

   Please provide a summary of the stress analysis of the 2 inch thick by 2 -1/2 inch wide "cask restraint ring" shown in Section 3711 of Burns & Roe Drawing 4288 for the loads induced by Rack B.

3. Section 2.2 of the Holtec Report notes that: "[b]ecause the platforms are not an integral part of the rack, their stress analysis and structural qualification are not addressed in this licensing report."

   Please provide a summary of the stress analyses for the Rack A and B platforms. Please provide the drawings for the platforms.

4. Section 8.4 of the Holtec Report documents that a modal analysis was performed on the SFP floor, and: "it was determined that the first mode frequency in the vertical direction is 35.4 Hz, which is larger than 33 Hz and, thus, in the rigid range. Therefore, seismic amplification due to slab flexibility is not an issue. These results justify development of equivalent static loads using the zero period accelerations as multipliers."

   Table 8.3.1 of the Holtec Report indicates that an uncracked section modulus was used for this computation. Please discuss the appropriateness of using an

uncracked section modulus to calculate the fundamental frequency of the SFP floor.

How does the calculation for the fundamental frequency of the SFP floor consider the static mass of the SFP water? This load does not appear to be listed in Table 8.5.1 of the Holtec Report. Section 2.3.3.2.4 of the Cooper Nuclear Station Updated Safety Analysis Report notes that the SFP contains about 2.1 million pounds (2,100 kips) of water.

5. Please discuss any nonconformances that are related to material degradation issues (concrete, rebar) in the SFP.

6. Table 6.7.1 of the Holtec Report specifies 4 percent damping for Operating Basis Earthquake (OBE) and 5 percent damping for Safe Shutdown Earthquake (SSE) as input data for the rack seismic analysis. Table 1 of NRC Regulatory Guide 1.61 specifies 2 percent damping for OBE and 4 percent damping for SSE for welded steel structures. Please discuss the appropriateness of the damping values used in the analysis.

III. The following questions are provided from the Steam Generator Tube Integrity and Chemical Engineering Branch (CSGB):

The proposed change revises TS 4.3, “Fuel Storage,” to reflect the addition of fuel storage capacity in the SFP by adding up to two additional storage racks. The increased fuel capacity involves use of the Metamic® neutron absorbing material.

The staff has conditioned prior acceptance of the Metamic® material for use in SFPs upon a coupon sampling program (e.g., Clinton, Arkansas Nuclear One) to ensure performance consistent with that described in the engineering reports.

An acceptable coupon sampling program has the following attributes:

- The size and types of coupons are similar in fabrication and layout to the proposed application, including welds or mechanical fasteners and proximity to stainless steel.

- The technique for measuring the initial B_4C content of the coupons is described.

- Scratches and other surface anomalies on the coupons simulate as-installed conditions of Metamic® panels.

- Justification of the frequency of coupon sampling is provided.

- Tests to be performed on coupons are specified; e.g., weight measurement, measurement of dimensions (length, width and thickness), and B_4C content and acceptance criteria.

1. Provide a detailed description of your coupon sampling program.

2. Please describe the scope of the receipt inspections performed on the Metamic® panels to establish a baseline. In addition, discuss who will perform these receipt inspections and where they will be performed.

3. Please discuss the surface preparation or anodizing process that will be used on the Metamic® panels? In addition, what cleaning process will be used to ensure sufficient removal of surface contaminants? Please note, the surface preparation for the coupons is to be similar to what is used on the Metamic® panels.

4. Please discuss how the Metamic® panels are to be attached to the new spent fuel racks (welding, mechanical fasteners, etc.). If the Metamic® panels are to be welded, what welding process will be used and what weld filler material will be used?

5. Given that Metamic® is a new material for SFP applications, we request that you submit the results of each surveillance to the staff. The reporting requirements should be addressed in your surveillance program. The reporting requirements should include the baseline inspection results and the results of all subsequent inspections (i.e., visual, length, width, thickness, weight, and neutron absorption).