



Nebraska Public Power District
Nebraska's Energy Leader

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NLS2002097
July 12, 2002

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Subject: Response to Request for Additional Information on License Amendment Request to Revise the Ultimate Heat Sink and Reactor Equipment Cooling Water Temperature Requirements
Cooper Nuclear Station, NRC Docket 50-298, DPR-46

Reference: Nebraska Public Power District letter, NLS2002008, to U.S. Nuclear Regulatory Commission dated May 20, 2002.

The purpose of this letter is to submit a response to Request for Additional Information (RAI) from the U.S. Nuclear Regulatory Commission (NRC) based on their review of the Reference license amendment request for the Cooper Nuclear Station (CNS). Request number 1 was communicated to Nebraska Public Power District (NPPD) verbally from the NRC Project Manager on July 8, 2002. NPPD provided a response to this request by electronic communication on July 9, 2002. Request numbers 2 and 3 were provided to NPPD by electronic communication on July 10, 2002. NPPD responses to these requests were discussed with the NRC staff during a telephone conference conducted on July 11, 2002. The information provided in the attached response is the same as that provided electronically on July 9, 2002, and as discussed during the telephone conference on July 11, 2002. There are no commitments in this submittal.

This information is being submitted under oath pursuant to 10 CFR 50.30(b). A copy is being provided to the NRC Region IV office and to the CNS Resident Inspector in accordance with 10 CFR 50.4(b)(1).

If you have any questions concerning this matter, please contact Mr. Paul Fleming at (402) 825-2774.

Sincerely,


Michael T. Coyle
Site Vice President

/rer

Accl

Attachment:

cc: Regional Administrator w/ attachment
USNRC - Region IV

Senior Project Manager w/ attachment
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector w/ attachment
USNRC

Nebraska Health and Human Services w/ attachment
Department of Regulation and Licensure

NPG Distribution w/o attachment

Records w/ attachment

Affidavit

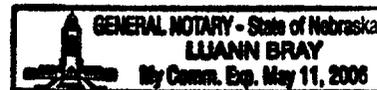
STATE OF NEBRASKA)
)
NEMAHA COUNTY)

Michael T. Coyle, being first duly sworn, deposes and says that he is an authorized representative of the Nebraska Public Power District, a public corporation and political subdivision of the State of Nebraska; that he is duly authorized to submit this correspondence on behalf of Nebraska Public Power District; and that the statements contained herein are true to the best of his knowledge and belief.

Michael T. Coyle
Michael T. Coyle

Subscribed in my presence and sworn to before me this 12th day of July, 2002.

Luan Bray
NOTARY PUBLIC



**Response to NRC Request for Additional Information
License Amendment Request to Increase the Technical Specification Temperature Limits
for the Ultimate Heat Sink and Reactor Equipment Cooling Water System**

**Cooper Nuclear Station
Nebraska Public Power District**

1. NRC Request

Provide additional information to allow a better understanding of how Nebraska Public Power District (NPPD) determined the existing heat transfer capabilities of the heat exchangers that serve the emergency diesel generators. Specifically, since performance testing has not been performed, discuss how the conservatism of the evaluation is assured. Discuss how water quality and heat exchanger fouling that occurs over time, factors that affect heat exchanger performance, have been accounted for, and how the conservatism of the evaluation is assured based on that information. Address intake air temperature assumed and discuss existing margin relative to actual air temperatures that have been experienced.

NPPD Response

The heat transfer capabilities for the diesel generator (DG) Lube Oil, DG Jacket Water, and DG Intercooler heat exchangers have been analytically demonstrated via calculation. The following conservatisms exist in the calculation, which provide assurance of adequate heat transfer at a 95°F river Ultimate Heat Sink temperature.

Fouling Assumptions: Design fouling values are assumed in the DG heat exchangers. This assumption is conservative based on the results of NRC Generic Letter 89-13 as-found inspections for the DG heat exchangers, which have consistently shown that heat transfer (tube) surfaces remain clean between inspection intervals. Current inspection intervals are every other cycle for DG lube oil and jacket water, and every cycle for the DG intercoolers.

Air Intake Temperature Assumptions: The DG heat exchanger calculation assumes a 290°F inlet air temperature into the intercooler, as specified on the manufacturer's data sheet. The intercooler outlet air temperature (inlet to the DG) is assumed to be at the 150°F vendor recommended maximum. From these values, the calculation then determines the minimum required service water flow for the intercooler. Actual intercooler cooling water flow rates measured during the most recent service water flow surveillance testing are more than double the minimum values. Actual DG inlet air temperatures measured during DG surveillance testing are typically less than 120°F.

Service Water Flow Assumptions: The DG heat exchanger calculation assumes cooling water flow rates which are ten percent less than the values calculated in the service water flow model. This model assumes the most limiting service water flow configuration with one service water pump supplying the essential service water loads. Actual cooling water flow rates measured during the service water flow surveillance testing exceed the minimum flow rates assumed in the calculation.

Tube Plugging Assumptions: The DG heat exchanger calculation establishes tube plugging limits for the lube oil and jacket water heat exchangers. Tube plugging margin exists on most of the DG heat exchangers which provides additional heat transfer surface area. No tube plugging margin exists for one of the jacket water heat exchangers. However, margin is available for this heat exchanger in terms of the assumed service water flow and the calculated jacket water temperature. No heat exchanger tubes are plugged in the intercoolers.

2. NRC Request

Are the actual cooling water conditions for diesel generator heat exchangers consistent with the design assumptions (e.g., quality of water, etc.)? Are the actual air conditions for diesel generator heat exchangers consistent with the design assumptions (e.g., quality of air)?

NPPD Response

The design fouling assumptions for the DG heat exchangers are 1) 0.002 for DG Jacket Water, 2) 0.0023 for DG Lube Oil, and 3) 0.001 for the DG intercoolers. These design fouling values were provided by the respective heat exchanger manufacturers and are documented on the individual heat exchanger TEMA specification sheets. These values are conservative with respect to the CNS raw cooling water used based on the following:

- 1) Periodic heat exchanger inspections indicating clean as-found heat transfer surfaces (tube surfaces), and
- 2) Recent intercooler airside inspections, which indicated negligible, air side fouling.

Additionally, taking items 1 and 2 into account, these fouling values are reasonable when compared to TEMA standards for river water.

Combustion air for the DG is drawn in from the atmosphere, passing through an oil-bath type, intake air filter. The filter removes any dirt entrained in the air and passes clean, filtered air to the turbocharger compressor. These filters are inspected on a periodic basis and maintained to ensure proper operation.

During the most recent refueling outage (November-December, 2001) routine cleaning and inspections were performed on DG1 and DG2 intercooler tube sides. In this evolution one intercooler in each diesel was removed and inspected. This provided an opportunity to inspect the airside of these heat exchangers. This inspection revealed that the airsides are in excellent condition with negligible fouling present.

3. NRC Request

With respect to the DG heat exchangers, what inspections and periodic cleaning is performed on the airside of the intercoolers? What effect does the "as found" condition have on fouling factor assumptions?

NPPD Response

CNS performs no periodic cleaning and inspection of the airside of the intercooler. Inspections of one intercooler on each DG during the most recent refueling outage (November-December 2001) identified negligible fouling.

