



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

February 5, 1998

Mr. G. R. Horn
Sr. Vice President of Energy Supply
Nebraska Public Power District
1414 15th Street
Columbus, NE 68601

SUBJECT: COOPER NUCLEAR STATION - DESIGN INSPECTION
(NRC INSPECTION REPORT NO. 50-298/97-201)

Dear Mr. Horn:

A design inspection at the Cooper Nuclear Station (CNS) was performed by the Special Inspection Section of the Office of Nuclear Reactor Regulation (NRR) during the period October 6, 1997, through December 4, 1997, including on-site inspections during October 27-November 7, 1997, November 17-21, 1997, and December 1-4, 1997. The team selected for inspection the residual heat removal (RHR) system and the reactor equipment cooling (REC) system. The purpose of the inspection was to evaluate the capability of the systems to perform safety functions required by their design bases, the adherence to the design and licensing bases, and the consistency of the as-built configuration with the updated safety analysis report (USAR).

The results of this inspection are presented in the enclosed report. The team selected and reviewed relevant portions of the USAR, technical specifications (TS), calculations, design criteria documents, drawings, modification packages, surveillance procedures, and other plant documents.

The team identified that the design change to the REC system for the installation of the filter demineralizer in 1991, the associated safety analysis, and the operating procedure did not address the importance of maintaining water inventory in the closed REC system. The REC system would not have been able to support its long-term cooling functions in the event of a design basis accident, because the minimum available volume of water in the surge tank would have been depleted within a day through the sampling valves that were left open apparently since the modification was installed in 1991. Your staff isolated the sampling valves, notified the NRC of the condition, and issued LER 97-014 on December 12, 1997, which identified the cause as a failure to understand the design basis functions of the system.

Although many calculations reviewed by the team were satisfactory, the team noted that nonconservative assumptions and design inputs were used in the calculations for estimating the RHR pump room temperature and for verifying the capability of the service water (SW) system to provide adequate back-up cooling for safety-related equipment in the REC system. A night order was issued to secure one of the RHR pumps if the fan coil unit in that room becomes inoperable, and SW back-up cooling calculation was revised.

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The 10 CFR 50.59 safety evaluation that was performed for the USAR revision to increase the RHRSW booster pump room temperature limit to 131°F did not address the consequences of operator actions required during post-accident conditions to prevent exceeding this temperature limit.

The effects of failure of air pressure regulators in the instrument air system on air operated valves had not been evaluated. At the exit meeting, we urged you to expedite this investigation and promptly perform operability evaluations as required.

Previous NRC inspections had identified weaknesses in factoring instrument uncertainties into test acceptance criteria and operating procedures. The team noted that the procedure for monitoring SW temperature and the surveillance test procedure for RHR pumps did not consider applicable instrument uncertainties.

The team also identified other issues, such as: weaknesses in performance monitoring of RHR and REC heat exchangers; an inadequate reportability review of a deficiency in the design of power sources to RHR heat exchanger vent valves; not including in operating procedures vendor recommended limitations on RHR pump operation at low flows; and not considering the potential for pumping post-accident leakage from ECCS to the radwaste system. In addition, the team has referred four issues identified in the report to the NRR staff for evaluation.

The team noted several discrepancies in the USAR, TS, and system design criteria documents. The design criteria document (DCD-13) for the RHR system contained several incorrect statements that were inconsistent with the current system design.

Some of the deficiencies discussed above challenged the capability of the systems to perform their full design bases functions. The contributory causes for these deficiencies appear to be a lack of understanding of the design bases of the systems, use of nonconservative assumptions and design inputs in calculations, and not maintaining control over the configuration of the design bases reflected in various plant documents. Where appropriate, your staff took immediate corrective or compensatory actions to ensure system operability. For other issues, you have initiated problem identification reports to address required corrective actions. Taking into consideration your immediate actions, the team concluded at the end of the inspection, that both systems were capable of performing their safety functions.

As with all NRC inspections, we expect that you will evaluate the applicability of the results of this inspection and the specific findings to other systems and components throughout the plant.

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DATED: February 5, 1998

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Mr G. R. Horn

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Any enforcement action resulting from this inspection will be handled by the NRC Region IV office via separate correspondence. Should you have any questions concerning the attached inspection report, please contact the project manager, Mr. J. R. Hannon (301) 415-1336, or the inspection team leader, Mr. S. K. Malur at (301) 415-2963.

Sincerely,

Original signed by

Donald P. Norkin FOR
Stuart A. Richards, Chief
Events Assessment, Generic Communication,
and Special Inspection Branch
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Docket No.: 50-298

Enclosure : NRC Inspection Report No.: 50-298/97-201

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Sincerely,

A handwritten signature in dark ink, appearing to read "Stuart A. Richards", written in a cursive style.

Stuart A. Richards, Chief
Events Assessment, Generic Communication,
and Special Inspection Branch
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Docket No.: 50-298

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cc: see next page

Nebraska Public Power Company

Cooper Nuclear Station

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