

February 14, 2008

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

SUBJECT: COOPER NUCLEAR STATION - ISSUANCE OF AMENDMENT RE: SAFETY
LIMIT MINIMUM CRITICAL POWER RATIO (TAC NO. MD6579)

Dear Mr. Minahan:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 229 to Facility Operating License No. DPR-46 for the Cooper Nuclear Station. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated August 10, 2007, as supplemented by letter dated December 20, 2007.

The amendment revises the TS 2.1.1.2 values of two recirculation loop and single recirculation loop safety limit minimum critical power ratio to reflect results of a cycle-specific calculation.

A copy of our related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

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

Enclosures: 1. Amendment No. 229 to DPR-46
2. Safety Evaluation

cc w/encls: See next page

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(*) SE memo dated

(**) See previous concurrence

Cooper Nuclear Station

(09/2007)

cc:

Mr. Ronald D. Asche
President and Chief Executive Officer
Nebraska Public Power District
1414 15th 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. 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. Paul V. Fleming, Director of Nuclear
Safety Assurance
Nebraska Public Power District
P.O. Box 98
Brownville, NE 68321

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

NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

COOPER NUCLEAR STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 229
License No. DPR-46

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Nebraska Public Power District (the licensee), dated August 10, 2007, as supplemented by letter dated December 20, 2007, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. DPR-46 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 229, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Thomas G. Hiltz, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to the Facility
Operating License No. DPR-46
and Technical Specifications

Date of Issuance: February 14, 2008

ATTACHMENT TO LICENSE AMENDMENT NO. 229

FACILITY OPERATING LICENSE NO. DPR-46

DOCKET NO. 50-298

Replace the following pages of the Facility Operating License No. DPR-46 and Appendix A Technical Specifications with the enclosed revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Facility Operating License

REMOVE

3

INSERT

3

Technical Specifications

REMOVE

2.0-1

INSERT

2.0-1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 229 TO

FACILITY OPERATING LICENSE NO. DPR-46

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

By application dated August 10, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML072280313), as supplemented by letter dated December 20, 2007 (ADAMS Accession No. ML073601018), Nebraska Public Power District (the licensee), requested changes to the Technical Specifications (TSs) for Cooper Nuclear Station (CNS). The supplement dated December 20, 2007, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on September 25, 2007 (72 FR 54475).

The proposed changes would revise the TS 2.1.1.2 values of two recirculation loop and single recirculation loop safety limit (SL) minimum critical power ratio (MCPR) to reflect the results of a cycle-specific calculation. Specifically, the licensee proposes to change the SLMCPR values in TS 2.1.1.2 for two recirculation loop operation from ≥ 1.12 to ≥ 1.10 , and for single recirculation loop operation from ≥ 1.14 to ≥ 1.12 .

CNS is currently in Cycle 24. The CNS Cycle 24 reactor core has 548 General Electric-14 (GE14) fuel assemblies, of which there are 128 fresh GE14 bundles, 164 once-burned GE14 bundles, 128 twice-burned GE14 bundles, 104 three times-burned GE14 bundles, and 24 four times-burned GE14 bundles.

2.0 REGULATORY EVALUATION

Section 50.36 of Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR 50.36) is the Commission's regulatory requirement that TSs are needed and that TSs are required to include items in five specific categories related to facility operation. One of the five categories is paragraph 50.36(d)(1), "Safety limits, limiting safety system settings, and limiting control settings." Paragraph 50.36(d)(1)(i)(A) requires safety limits upon important process variables that are found to be necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity. In this regard, the lowest allowable transient MCPR limit which meets the design requirement to protect fuel cladding integrity is termed the fuel cladding integrity SLMCPR.

Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 10, "Reactor design," states "[t]he reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences."

The fuel cladding must not sustain damage as a result of normal and abnormal operational transients. The reactor core safety limits are established to preclude violation of the fuel design criterion that at least 99.9 percent of the fuel rods in the core would not be expected to experience the onset of transition boiling. As part of a reload core design, cycle-specific transient analyses are performed to determine the required SLMCPR and the change in critical power ratio (CPR) for specific transients. The lowest allowable transient minimum CPR (MCPR) limit which meets the design requirement is called the fuel cladding integrity SLMCPR.

The safety design basis is further described in CNS Updated Safety Analysis Report Section III-7.

3.0 TECHNICAL EVALUATION

The CNS Cycle 24 SLMCPR analysis was performed for the licensee by its contractor, Global Nuclear Fuels - Americas, LLC, using the plant- and cycle-specific fuel and core parameters and NRC-approved methodologies, including NEDE-24011-P-A-15, "General Electric Standard Application for Reactor Fuel [GESTAR-II]," NEDE-32505P-A, Revision 1, "R-Factor Calculation Method for GE11, GE12 and GE13 Fuel," NEDC-32601P-A, "Methodology and Uncertainties for Safety Limit MCPR Evaluations," NEDC-32694P-A, "Power Distribution Uncertainties for Safety Limit MCPR Evaluation," and NEDO-10958-A, "General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation, and Design Application." The licensee provided a supporting document, SSP-07/405-C, Revision 1, "GARDEL BWR - [CNS] - Power Distribution Uncertainties," prepared by Studsvik Scandpower, Inc., which was used to evaluate the uncertainties in the adaptive relative power distribution within GARDEL, the core monitoring system used at CNS. The GARDEL bundle power uncertainties are not used in the CNS SLMCPR calculation. The CNS SLMCPR calculation uses the previous NRC-approved uncertainties as documented in NEDO-10958-A. The licensee stated that credit is not taken for the lower GARDEL uncertainties for the CNS SLMCPR calculation.

The NRC staff reviewed the licensee's justification for the SLMCPR value of ≥ 1.10 for two recirculation loop operation and ≥ 1.12 for single loop operation using the approach stated in GESTAR-II, Revision 15. The staff also reviewed the information provided by the licensee with respect to no askew axial power distribution experienced during Cycle 24 operation, and the coefficient and standard deviation values used in the calculation using the approximation formula. Based on its review, the staff concluded that the licensee's SLMCPR analysis for Cycle 24 operation using the plant- and cycle-specific calculations, in conjunction with the NRC-approved methodology, is acceptable.

The licensee's analysis shows that at least 99.9 percent of the fuel rods in the Cycle 24 core are expected to avoid boiling transition (and, therefore, cladding damage due to overheating) if the MCPR is greater than or equal to the proposed fuel cladding integrity SLMCPR, which satisfies

the requirements of GDC 10 regarding acceptable fuel design limits. The licensee used NRC-approved methodologies in conjunction with (1) the assumption of a higher R-Factor uncertainty, (2) performance of a bounding calculation at rated core power and minimum core flow, and (3) analysis of power shape for Cycle 24 operation demonstrating no fuel axial power shape penalty. Therefore, the staff concluded that the licensee's justification for analyzing and determining the SLMCPR value of ≥ 1.10 for two recirculation loop operation and ≥ 1.12 for single recirculation loop operation for CNS is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Nebraska State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding published in the *Federal Register* on September 25, 2007 (72 FR 54475). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

7.0 REFERENCES

1. Letter (NLS2007032) from Stewart B. Minahan (licensee) to NRC, "License Amendment Request to Revise Technical Specifications - Safety Limit Minimum Critical Power Ratio Cooper Nuclear Station, NRC Docket 50-298, DPR-46," August 10, 2007.

2. Letter (NLS2007085) from Michael J. Colomb (licensee) to NRC, "Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications - Safety Limit Minimum Critical Power Ratio Cooper Nuclear Station, Docket No. 50-298, DPR-46," December 20, 2007.

Principal Contributor: T. Huang

Date: February 14, 2008