

OCT 25 1974

Docket No. 50-298

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Nebraska Public Power District
 ATTN: Mr. J. M. Pilant, Manager
 Licensing and Quality Assurance
 P. O. Box 499
 Columbus, Nebraska 68601

Gentlemen:

The Commission has issued the enclosed Amendment No. 6 to Facility Operating License No. DPR-46 for the Cooper Nuclear Station. The amendment includes Change No. 9 to the Technical Specifications, Appendix A, and is an interim measure to allow operating flexibility while one of the proposed changes requested in your application of May 28, 1974, is under consideration.

The amendment permits an 8% increase in the maximum average planar linear heat generation rate curves for average planar exposures up to 6000 MWD/T.

Copies of the related Safety Evaluation and the Federal Register Notice are also enclosed.

Sincerely,

Dennis L. Ziemann, Chief
 Operating Reactors Branch #2
 Directorate of Licensing

Enclosures:

1. Amendment No. 6
2. Safety Evaluation
3. Federal Register Notice

RSchemel
 ACRS (16)
 HJMcAlduff, ORO
 JRBuchanan, ORNL
 TBAbernathy, DTIE

cc w/encis:
 See next page

OFFICE →	L:ORB #2	L:ORB #2	L:ORB #2	TR	OGC	L:OR
SURNAME →	JSapir:aw	RMDiggs	DLZiemann	VSrelio	R. Kinsey	KRGoller
DATE →	10/23/74	10/23/74	10/23/74	10/23/74	10/28/74	10/25/74

OCT 25 1971

cc w/encls:

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Nebraska County Courtroom
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Auburn Public Library
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Auburn, Nebraska 68305

Mr. James L. Higgins, Director
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Mr. Ed Vest
Environmental Protection Agency
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NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

COOPER NUCLEAR STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 6
License No. DPR-46

1. The Atomic Energy Commission (the Commission) has found that:
 - A. The application for amendment by Nebraska Public Power District (the licensee) dated May 28, 1974, 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 amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. Prior public notice of this amendment is not required since the amendment does not involve a significant hazards consideration.
2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 2.C.(2) of Facility License No. DPR-46 is hereby amended to read as follows:

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"(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. 9."

3. This license amendment is effective as of the date of its issuance.

FOR THE ATOMIC ENERGY COMMISSION

Original Signature:
Karl R. Goller

Karl R. Goller, Assistant Director
for Operating Reactors
Directorate of Licensing

Attachment:
Change No. 9 to the
Technical Specifications

Date of Issuance: OCT 25 1974

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ATTACHMENT TO LICENSE AMENDMENT NO. 6

CHANGE NO. 9 TO THE TECHNICAL SPECIFICATIONS

FACILITY OPERATING LICENSE NO. DPR-46

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

The Technical Specifications contained in Appendix A, attached to Facility Operating License No. DPR-46, are hereby changed as follows and revised pages incorporating this change is appended hereto:

1. On page 123, add the following to the end of Section 3.5.I:

The MAPLHGR may exceed the values shown in Figure 3.5.1 by no more than 8% for average planar exposures up to 6000 MWD/T.

2. On page 130, add the following to the end of the Bases Section 3.5.I.

Based on calculations allowing gap closure due to pellet cracking and relocation, the MAPLHGR has been increased by 8%. These calculations apply for average planar exposures up to 6000 MWD/T.

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LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENT

3.5.H. Engineered Safeguards Compartments Cooling

If the unit coolers serving the Reactor Core Isolation Cooling (RCIC), High Pressure Coolant Injection (HPCI), Core Spray or Residual Heat Removal (RHR) pump are out of service, the associated pump shall be considered inoperable for purposes of Specifications 3.5.A, 3.5.C, or 3.5.D as applicable.

I. Average Planar LHGR

During steady state power operations, the average linear heat generation rate (LHGR) of all the rods in any fuel assembly, as a function of the average planar exposure, at any axial location, shall not exceed the maximum average LHGR shown in Figure 3.5.1.

The MAPLHGR may exceed the values shown in Figure 3.5.1 by no more than 8% for average planar exposures up to 6000 MWD/T.

J. Local LHGR

During steady state power operation, the linear heat generation rate (LHGR) of any rod in any fuel assembly at any axial location shall not exceed the maximum allowable LHGR as calculated by the following equation:

$$LHGR_{max} \leq LHGR_d [1 - \{(\Delta P/P)_{max} (L/LT)\}]$$

$LHGR_d$ = Design LHGR = 18.5 KW/ft.

$(\Delta P/P)_{max}$ = Maximum power spiking penalty
= 0.038

LT = Total core length = 12 feet

L = Axial position above bottom of core

4.5.4 Engineered Safeguards Compartments Cooling

The unit coolers for the RCIC, HPCI, Core Spray, and RHR pumps shall be checked for operability during surveillance testing of the associated pumps.

I. Average Planar LHGR

Daily during reactor power operation, the average planar LHGR shall be checked.

J. Local LHGR

Daily during reactor power operation, the local LHGR shall be checked.

3.5 BASES (cont'd)

The curves used to determine pellet-clad thermal conductance as a function of linear heat generation are based on experimental data and predict with a 95% confidence that 90% of the population exceed the predictions. Based on calculations allowing gap closure due to pellet cracking and relocation, the MAPLHGR has been increased by 8%. These calculations apply for average planar exposures up to 6000 MWD/T.

J. Local LHGR

This specification assures that the linear heat generation rate in any rod is less than the design linear heat generation even if fuel pellet densification is postulated. The power spike penalty specified is based on the analysis presented in Section 3.2.1 of the GE topical report NEDM-10735 Supplement 6, and assumes a linearly increasing variation in axial gaps between core bottom and top, and assures with a 95% confidence, that no more than one fuel rod exceeds the design linear heat generation rate due to power spiking.

SAFETY EVALUATION BY THE DIRECTORATE OF LICENSING

SUPPORTING AMENDMENT NO. 6 TO FACILITY OPERATING LICENSE NO. DPR-46

CHANGE NO. 9 TO THE TECHNICAL SPECIFICATIONS

NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

INTRODUCTION

By letter dated May 28, 1974, the Nebraska Public Power District (NPPD) proposed several changes to the Technical Specifications of Facility Operating License No. DPR-46 for the Cooper Nuclear Station (CNS). One of the proposed changes would increase the maximum average planar linear heat generation rate (MAPLHGR) based upon results obtained by incorporating the GEGAP - III code into the General Electric fuel densification model. Because (1) the proposed change would result in a significant increase in MAPLHGR and (2) the GEGAP - III code represented a new and different calculational method not previously used at Cooper Nuclear Station, the Regulatory staff concluded that the proposed action should be pre-noticed in the Federal Register. Accordingly, a Notice of Proposed Issuance was published in the Federal Register on October 16, 1974 (39 F. R. 37000).

To enable the Cooper Nuclear Station to attain rated power and complete the startup test program while the Commission is considering NPPD's original request, the staff has refined the GE fuel densification model originally used in the CNS analysis. Based on this refinement, the staff has concluded that a small increase in MAPLHGR should be allowed.

DISCUSSION AND EVALUATION

The fuel densification model used in the CNS analysis is described in NEDM-10735 entitled, "Densification Considerations in BWR Fuel Design and Performance" and supplements 1 through 8 to that report. The Regulatory staff's evaluation of that model entitled, "Technical Report on Densification

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of General Electric Reactor Fuels¹¹ was issued August 23, 1973. Although in its evaluation the staff recognized that evidence of gap closure (between the fuel pellet and cladding) was persuasive, it adopted the conservative position that until this effect could be further quantified no credit would be taken for it in the analysis. Based on a subsequent review of applicable data, the Regulatory staff has concluded that an allowance of a 25% gap closure due to pellet cracking and relocation is a suitably conservative position which more accurately reflects the physical conditions within the fuel.

The closure of the fuel pellet-to-cladding gap increases the gap conductance, reduces the stored energy in the fuel rod which, for a given MAPLHGR value, reduces the calculated peak clad temperature (PCT) following a postulated loss-of-coolant accident (LOCA). Conversely, an increase in gap conductance allows a compensating increase in MAPLHGR for a constant peak clad temperature. Using data and parametric results presented in NEDM-10735, the staff has estimated the effect of a 25% gap closure on the allowable MAPLHGR. The results indicate that for average planar exposures up to 6000 MWD/T a 25% gap reduction would allow a 18% increase in MAPLHGR while maintaining the current limit of 2300°F on PCT. Since an 8% increase in MAPLHGR will achieve 100% of rated power, less than half of the calculated allowable increase will be granted.

Based on the above, the staff concludes that an 8% increase in the MAPLHGR limitations up to an average planar exposure of 6000 MWD/T will maintain the current design safety margins and will not increase the probability or consequences of any accidents previously considered. Furthermore, an 8% increase in MAPLHGR will allow CNS to attain full power and proceed with the 100% power startup tests. The staff believes that expeditious performance of these tests is desirable and will in fact enhance plant safety. Accordingly, Section 3.5.I of the Technical Specifications have been modified to allow an 8% increase in the MAPLHGR for average planar exposures up to 6000 MWD/T.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the change does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the change does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security and to the health and safety of the public.

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UNITED STATES ATOMIC ENERGY COMMISSION

DOCKET NO. 50-298

NEBRASKA PUBLIC POWER DISTRICT

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY LICENSE

Notice is hereby given that the U. S. Atomic Energy Commission (the Commission) has issued Amendment No. 6 to Facility Operating License No. DPR-46 issued to Nebraska Public Power District which revised Technical Specifications for operation of the Cooper Nuclear Station, located in Nemaha County, Nebraska. The amendment is effective as of its date of issuance.

The amendment permits operation with an 8% increase in maximum average planar linear heat generation rate for average planar exposures up to 6000 MWD/T.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment.

For further details with respect to this action, see (1) the application for amendment dated May 28, 1974, (2) Amendment No. 6 to License No. DPR-46, with Change No. 9, and (3) the Commission's concurrently issued Safety Evaluation. All of these items are available for public inspection

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at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Auburn Public Library, 1118 - 15th Street, Auburn, Nebraska 68305. A copy of items (2) and (3) may be obtained upon request addressed to the United States Atomic Energy Commission, Washington, D. C. 20545, Attention: Deputy Director for Reactor Projects, Directorate of Licensing - Regulation.

Dated at Bethesda, Maryland, this *25th* day of *October*, 1974.

FOR THE ATOMIC ENERGY COMMISSION

Dennis L. Ziemann
Dennis L. Ziemann

Dennis L. Ziemann, Chief
Operating Reactors Branch #2
Directorate of Licensing

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