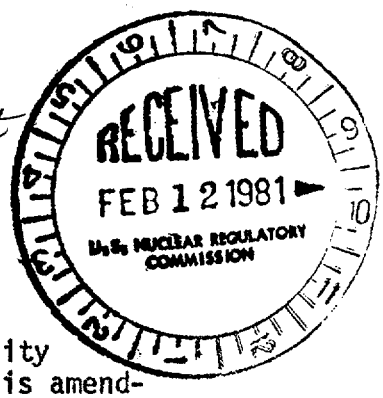
Distribution
Local PDR
Docket
NRC PDR
ORB #2
DEisenhut
RPurple
TNovak
RTedesco
GLainas
~~JRoe~~
SNorris
BSiegel
OELD
OI&E (5)
~~BJones~~ (4) Barnhart
BScharf (10)
JWetmore
ACRS (16)
OPA (CMiles)
RDiggs
HDenton
JHeltemes, AEOD
NSIC
TERA
Chairman, ASLAB

JAN 30 1981

Docket No. 50-298

Mr. J. M. Pilant, Director
Licensing & Quality Assurance
Nebraska Public Power District
P. O. Box 499
Columbus, Nebraska 68601



Dear Mr. Pilant:

The Commission has issued the enclosed Amendment No. 67 to Facility Operating License No. DPR-46 for the Cooper Nuclear Station. This amendment consists of changes to the Technical Specifications in partial response to your application of January 30, 1980 as supplemented October 30, 1980. The remaining items in your January 30, 1980 application will be addressed at a later date.

The amendment establishes MAPLHGR limits for the 7x7 (types 2 and 3) and the 8x8 (types 8D250 and 8D274) fuel assemblies for exposure values beyond those currently given in the Technical Specifications. With your concurrence, the staff has modified the MAPLHGR and exposure limits in your proposed Technical Specification change to conservatively account for the effects of enhanced fission gas release. The staff modification imposes a reduction in MAPLHGR limits for exposures above 30,000 MWd/t and limits the extension of the MAPLHGR exposure limits to 36,000 MWd/t. These limitations are applicable for the remainder of Cycle 6 only. For subsequent cycles, the MAPLHGR values for the fuel types identified in Figures 3.11-1.1 to 3.11-1.4 of your proposed Technical Specification changes are applicable up to an exposure limit of 30,000 MWd/t.

You have stated that it is not your intent to exceed 40,000 MWd/t (short ton) peak pellet exposure for any fuel type for any operating cycle. This constraint will continue to apply and may occur before planar average exposures of 36,000 MWd/t are approached.

You will note that Tables S-3 and S-4 of 10 CFR 51.20 are based on an average fuel burnup of 33,000 MWD/metric ton for irradiated fuel from the reactor. Therefore, even though this amendment establishes MAPLHGR limits for fuel burnup out to 36,000 MWd/t, the average level of irradiation of the irradiated fuel from the reactor should not exceed 33,000 MWD/metric ton.

P

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OFFICE ▶							
SURNAME ▶							
DATE ▶							

NRC FORM 318 (10/80) NRCM 0240 **OFFICIAL RECORD COPY** ☆ USGPO: 1980—329-824

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

Original Signed by
T. A. Ippolito

Thomas A. Ippolito, Chief
Operating Reactors Branch #2
Division of Licensing

Enclosures:
1. Amendment No. 67 to DPR-46
2. Safety Evaluation
3. Notice

cc w/enclosures:
See next page

*SEE PREVIOYS WHITE FOR CONCURRENCES

OFFICE	ORB #2	ORB #2	ORB #2	AD:OR	TRV	OELD	
URNAME	*SNorris:mjf	BSiegel*	*TIppolito	*TNovak	WJohnson	*JGray	
DATE	12/31/80	1/ 7/81	1/7/81	1/8/81	1 /29/81	1/16/81	

Distribution:

Docket	OI&E (5)
NRC PDR	B. Jones (4)
Local PDR	B. Scharf (10)
ORB #2 Reading	J. Wetmore
D. Eisenhut	ACRS (16)
R. Purple	OPA (Clare Miles)
T. Novak	R. Diggs
R. Tedesco	H. Denton
G. Lainas	J. Heltemes, AEOD
J. Roe	NSIC
S. Norris	TERA
B. Siegel	Chairman, ASLAB
OELD	

JAN 30 1981

Docket No. 50-298

Mr. J. M. Pilant, Director
Licensing & Quality Assurance
Nebraska Public Power District
P. O. Box 499
Columbus, Nebraska 68601

Dear Mr. Pilant:

The Commission has issued the enclosed Amendment No. to Facility Operating License No. DPR-46 for the Cooper Nuclear Station. This amendment consists of changes to the Technical Specifications in partial response to your application of January 30, 1980 as supplemented October 30, 1980.

The amendment establishes MAPLHGR limits for the 7x7 (types 2 and 3) and the 8x8 (types 8D250 and 8D274) fuel assemblies for exposure values beyond those currently given in the Technical Specifications. The remaining items in your January 30, 1980 application will be addressed at a later date.

You have stated that it is not your intent to exceed 40,000 MWD/t (short ton) peak pellet exposure for any fuel type for any operating cycle. This constraint will continue to apply and will occur before planar average exposures of 40,000 MWD/t are approached.

You will note that Tables S-3 and S-4 of 10 CFR 51.20 are based on an average fuel burnup of 33,000 MWD/metric ton for irradiated fuel from the reactor. Therefore, even though these amendments establish MAPLHGR limits for fuel burnup out to 40,000 MWD/t, the average level of irradiation of the irradiated fuel from the reactor should not exceed 33,000 MWD/metric ton.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

Thomas A. Ippolito, Chief
Operating Reactors Branch #2
Division of Licensing

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

cc w/enclosures: See next page

Amendment & FR Notice only. Concurrence conditioned on noted change to FR Notice

OFFICE	ORB #2	ORB #2	ORB #2	AD:OR	TRV	OELD	
SURNAME	SNorris	BSiegel:kf	TIppolito	TNovak	WJohnston	J.R.GRAY	
DATE	12/31/80	1/17/81	1/17/81	1/18/81	1/1	1/16/81	

NRC FORM 318 (10/80) NRCM 0240 **OFFICIAL RECORD COPY** ☆ USGPO: 1980—329-824

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

January 30, 1981

Docket No. 50-298

Mr. J. M. Pilant, Director
Licensing & Quality Assurance
Nebraska Public Power District
P. O. Box 499
Columbus, Nebraska 68601

Dear Mr. Pilant:

The Commission has issued the enclosed Amendment No. 67 to Facility Operating License No. DPR-46 for the Cooper Nuclear Station. This amendment consists of changes to the Technical Specifications in partial response to your application of January 30, 1980 as supplemented October 30, 1980. The remaining items in your January 30, 1980 application will be addressed at a later date.

The amendment establishes MAPLHGR limits for the 7x7 (types 2 and 3) and the 8x8 (types 8D250 and 8D274) fuel assemblies for exposure values beyond those currently given in the Technical Specifications. With your concurrence, the staff has modified the MAPLHGR and exposure limits in your proposed Technical Specification change to conservatively account for the effects of enhanced fission gas release. The staff modification imposes a reduction in MAPLHGR limits for exposures above 30,000 MWd/t and limits the extension of the MAPLHGR exposure limits to 36,000 MWd/t. These limitations are applicable for the remainder of Cycle 6 only. For subsequent cycles, the MAPLHGR values for the fuel types identified in Figures 3.11-1.1 to 3.11-1.4 of your proposed Technical Specification changes are applicable up to an exposure limit of 30,000 MWd/t.

You have stated that it is not your intent to exceed 40,000 MWd/t (short ton) peak pellet exposure for any fuel type for any operating cycle. This constraint will continue to apply and may occur before planar average exposures of 36,000 MWd/t are approached.

You will note that Tables S-3 and S-4 of 10 CFR 51.20 are based on an average fuel burnup of 33,000 MWD/metric ton for irradiated fuel from the reactor. Therefore, even though this amendment establishes MAPLHGR limits for fuel burnup out to 36,000 MWd/t, the average level of irradiation of the irradiated fuel from the reactor should not exceed 33,000 MWD/metric ton.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

Thomas A. Ippolito, Chief
Operating Reactors Branch #2
Division of Licensing

Enclosures:
1. Amendment No. 67 to DPR-46
2. Safety Evaluation
3. Notice

cc w/enclosures:
See next page

cc:

Mr. G. D. Watson, General Counsel
Nebraska Public Power District
P. O. Box 499
Columbus, Nebraska 68601

Mr. Arthur C. Gehr, Attorney
Snell & Wilmer
3100 Valley Center
Phoenix, Arizona 85073

Cooper Nuclear Station
ATTN: Mr. L. Lessor
Station Superintendent
P. O. Box 98
Brownville, Nebraska 68321

Auburn Public Library
118 - 15th Street
Auburn, Nebraska 68305

Director
Nebraska Dept. of Environmental Control
P. O. Box 94877, State House Station
Lincoln, Nebraska 68509

Mr. William Siebert, Commissioner
Nemaha County Board of Commissioners
Nemaha County Courthouse
Auburn, Nebraska 68305

Director, Criteria and Standards
Division
Office of Radiation Programs (ANR-460)
U. S. Environmental Protection Agency
Washington, D. C. 20460

U. S. Environmental Protection Agency
Region VII Office
ATTN: EIS COORDINATOR
324 East 11th Street
Kansas City, MO 64106

Mr. Dennis Dubois
USNRC
Resident Inspector
P. O. Box 446
Nebraska City, NA 68410

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

COOPER NUCLEAR STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 67
License No. DPR-46

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Nebraska Public Power District (the licensee) dated January 30, 1980, as supplemented October 30, 1980, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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. 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 2C(2) of Facility Operating License No. DPR-46 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 67 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Thomas A. Ippolito, Chief
Operating Reactors Branch #2
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 30, 1981

ATTACHMENT TO LICENSE AMENDMENT NO. 67

FACILITY OPERATING LICENSE NO. DPR-46

DOCKET NO. 50-298

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number.

Remove	Insert
211	211
211a	211a

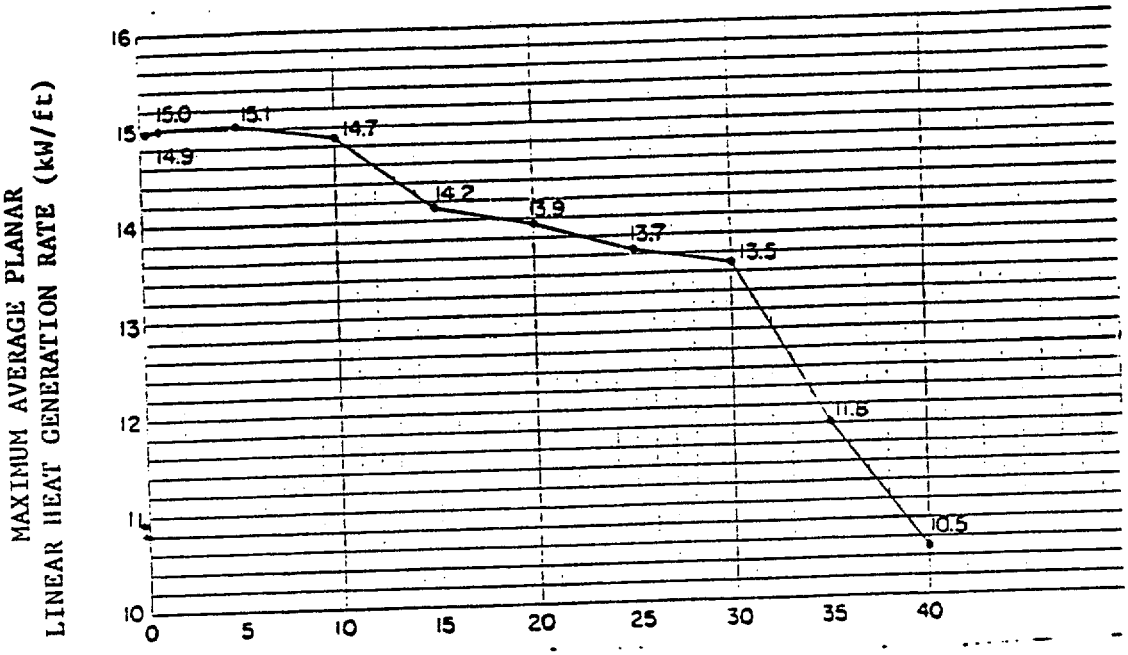

Figure 3.11-1.1 Maximum Average Planar Linear Heat Generation Rate versus Exposure with LPCI Modification and Bypass Flow Holes Plugged, Initial Core Fuel Type 3.

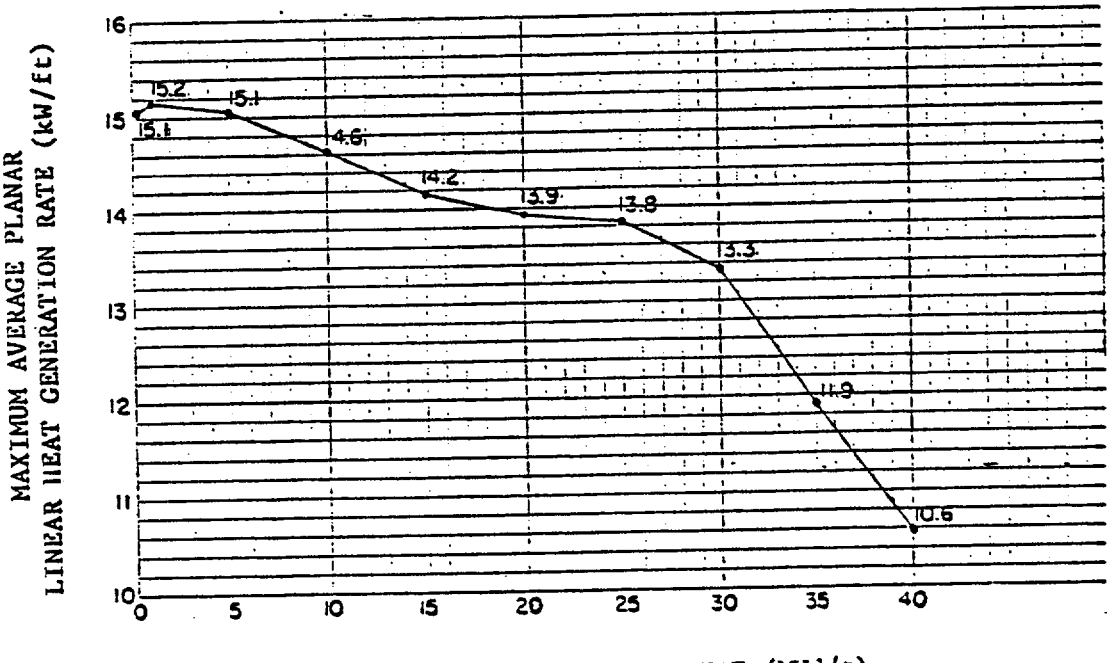

Figure 3.11-1.2 Maximum Average Planar Linear Heat Generation Rate versus Exposure with LPCI Modification and Bypass Holes Plugged, Initial Core Fuel Type 2.

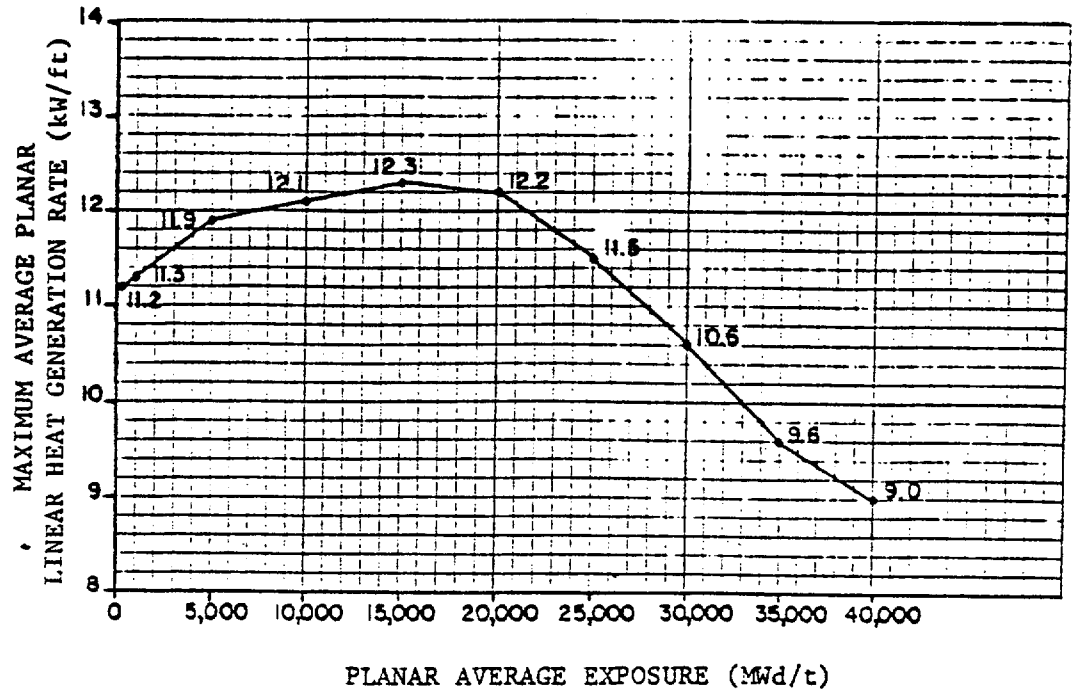

Figure 3.11-1.3. Maximum Average Planar Linear Heat Generation Rate versus Exposure with LPCI Modification and Bypass Flow Holes Plugged, 8D250 Fuel

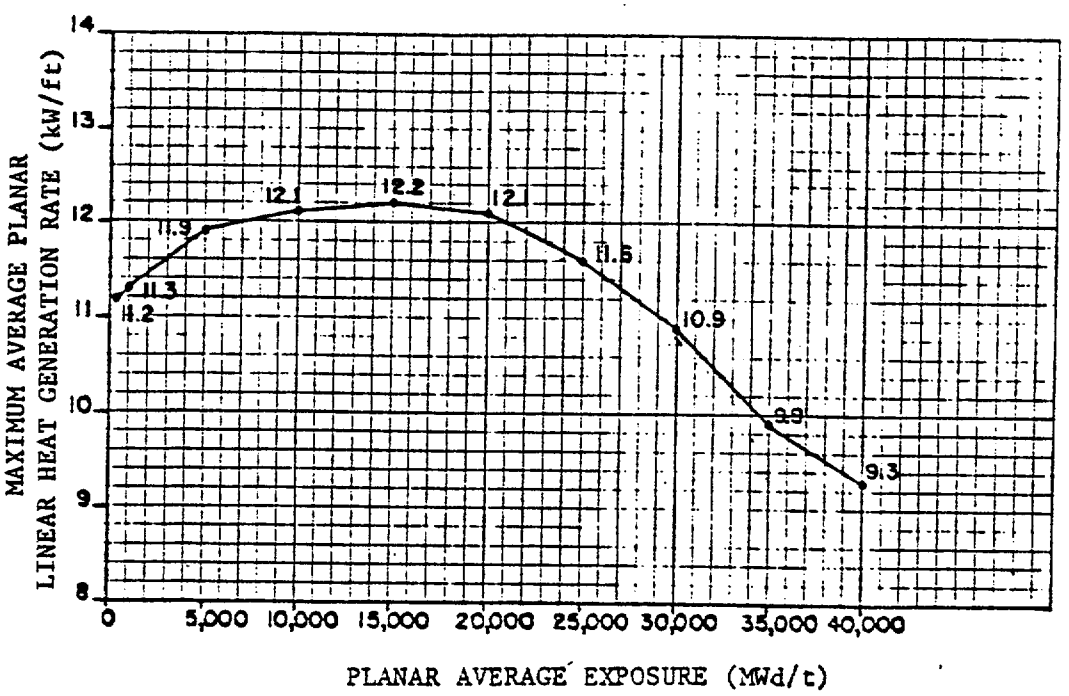

Figure 3.11-1.4. Maximum Average Planar Linear Heat Generation Rate versus Exposure with LPCI Modification and Bypass Flow Holes Plugged, 8D274L Fuel

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 67 TO LICENSE NO. DPR-46

NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

COOPER NUCLEAR STATION

1.0 INTRODUCTION

By letters dated January 30, 1980 (1) and October 30, 1980 (2), Nebraska Public Power District (the licensee) has requested an amendment to the Technical Specifications for the Cooper Nuclear Station. The effect of the amendment would be to extend the exposure range of the Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) versus average planar exposure values for the 7x7 (types 2 and 3) and 8x8 (types 8D250 and 8D274) fuel assemblies loaded in the core. The proposed extension would provide MAPLHGR limits for the fuel bundle types identified to an average planar exposure of 40,000 MWd/t which is 10,000 MWd/t beyond the current exposure range of 30,000 MWd/t.

2.0 EVALUATION

The licensee determined that average planar exposure for the type 2 and type 3 and for the 8D250 and 8D247 fuel assembly types would probably exceed 30,000 MWd/t before the end of the current operating cycle (cycle 6). The Technical Specifications now provide MAPLHGR limits for these fuel types up to a maximum planar exposure of 30,000 MWd/t. Therefore, continued exposure of these fuel types beyond 30,000 MWd/t requires an extension of the MAPLHGR limits.

It is required by 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors," that a power reactor "be provided with an emergency core cooling system (ECCS) which shall be designed such that its calculated cooling performance following postulated loss-of-coolant accidents conforms to the criteria set forth" in 10 CFR 50.46. Technical Specifications restrict plant operations to linear heat generation rates for which the required calculations are valid.

License Amendment No. 39 which was issued October 14, 1977 (3) provided MAPLHGR limits for both the Cooper Nuclear Station 7x7, types 2 and 3, and the 8x8, types 8D250 and 8D274 fuel assemblies to an average planar exposure of 30,000 MWd/t using the methodology of NEDO-24045"Loss-of-Coolant Accident Analysis Report for Cooper Nuclear Station". The staff

reviewed the analysis including the models used in calculating ECCS performance for the aforementioned fuel types and concluded that when the facility was operated in accordance with the MAPLHGR limits of Amendment No. 39 and other existing restrictions, the facility would be in conformance with all requirements of 10 CFR 50.46 and Appendix K to 10 CFR 50.46.

In order to extend the MAPLHGR versus average planar exposure range to 40,000 MWd/t for the subject 7x7 and 8x8 fuel assemblies, higher exposure points are being added by the licensee which were generated using the same methodology of NEDO-24045 which was previously approved for average planar exposures up to 30,000 MWd/t in Reference 3. Although the methodology used is generally applicable for an average planar exposure up to 40,000 MWd/t, the staff believes the effects of enhanced fission gas release in high burnup fuel (above 30,000 MWd/t) are not adequately accounted for in your submittals. To compensate for this deficiency, the staff has estimated the amount the MAPLHGR limits in Figures 3.11-1.1 to 3.11-1.4 of the proposed Technical Specifications should be reduced to assure the peak cladding temperature and local oxidation are below the limits allowed by 10 CFR 50.46. The reduction imposed is based on the results of comparative calculations of fuel volume average temperature performed by General Electric using GEGAP III with and without an NRC correction for enhanced fission gas release and the relationship between peak cladding temperature and MAPLHGR increase presented in NEDE-23786-1-P.(4). In estimating the MAPLHGR reduction, the staff conservatively assumed the change in volume average temperature can be translated directly into a peak cladding temperature change. Table 1 gives the percent reduction in MAPLHGR as a function exposure above 30,000 MWd/t for the 7X7 (types 2 and 3) and 8x8 (types 8D250 and 8D2741) fuel in your submittals. We have limited the extension of the MAPLHGR to 36,000 MWd/t to account for the uncertainties in enhanced fission gas release above this exposure.

TABLE 1 - REDUCTION IN MAPLHGR AS A FUNCTION OF EXPOSURE

Exposure MWd/t	30,000	32,000	34,000	36,000
Reduction MAPLHGR, %	9.0	12.5	16.25	20.5

These MAPLHGR reductions to the licensee's proposed Technical Specifications in Figures 3.11-1.1 to 3.11-1.4 assures that the cladding temperature and local cladding oxidation would remain below the 2200°F (peak cladding temperature) and 17% (local cladding oxidation) limit allowed by 10 CFR 50.46 when the effects of enhanced fission gas release above 30,000 MWd/t are conservatively accounted for.

The licensee has agreed to the reductions in MAPLHGR limits given in Table 1 and to the 36,000 MWd/t exposure limit as per discussions on January 27, 1981. These limitations are applicable for the remainder of Cycle 6 only. For subsequent cycles, the licensee proposed MAPLHGR values for the fuel types identified in Figures 3.11-1.1 to 3.11-1.4 are applicable only up to an exposure of 30,000 MWd/t. Accordingly, we find the proposed MAPLHGR versus average planar exposure values acceptable if modified as stated.

Another area having safety implications which requires consideration is the 1% plastic strain criterion of the Zircaloy fuel rod cladding as the safety limit below which fuel damage due to overstraining is not expected to occur. At extended exposures (i.e., beyond 40,000 MWd/t peak pellet exposure) this safety limit had not been calculated. The licensee has stated that the peak pellet exposure of the 7x7 and 8x8 fuel types should not exceed 40,000 MWd/t during Cycle 6. Furthermore, since operation beyond this exposure would require additional analyses, the licensee has stated that it is their intent not to exceed this exposure limit for any fuel type during future operating cycles without additional analyses (5). Also the probability of a high exposure bundle achieving power levels that would challenge the 1% plastic strain limit is extremely small, based on analysis performed in accordance with the approved methodology of NEDO-24045 "Loss-of-Coolant Accident Analysis Report for Cooper Nuclear Station."

Exposure restrictions due to the 1% plastic strain limit at extended exposures is the subject of ongoing generic review by the staff. Although its treatment for the current application is acceptable and does not invalidate the basis or conclusions of any of our previous approvals of the thermal-mechanical design of the 7x7 and 8x8 fuel for peak pellet exposures up to 40,000 MWd/t, future generically related changes may be necessary.

ENVIRONMENTAL CONSIDERATIONS

In addition to the two areas of consideration having safety implications, the staff considered the proposed changes in the light of Tables S-3 and S-4 of 10 CFR Part 51, which addresses uranium fuel cycle and fuel transportation environmental impacts.

The assumed maximum average level of exposure of the irradiated fuel discharge from the reactor used in these analyses is 33,000 MWD/MTU (megawatt days per metric ton) which is equivalent to 29,000 Mwd/t (megawatt days per short ton). Although this amendment establishes MAPLHGR limits for fuel burnup out to 36,000 MWd/t, since this limit is based on the peak exposure of the most limiting mode of the high burnup fuel assemblies in the core, this amendment will not cause the

average fuel burnup of 33,000 MWD/MTU (29,900 MWd/t) for the irradiated fuel from the reactor to be exceeded. This is because the peak mode in any of the most highly exposed bundles is typically in the order of 20% greater than the average exposure of these bundles and these most highly exposed bundles are likely to have a 10% higher average exposure than the remainder of the bundles being discharged.

We have determined that this amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that this amendment involves an action which is insignificant from the standpoint of environmental impact, and pursuant to 10 CFR Section 51.5(d)(4) that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment 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 amendment 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 or to the health and safety of the public.

Dated: January 30, 1981

REFERENCES

1. Nebraska Public Power District letter (J. M. Pilant) to USNRC (H. Denton), "Proposed Changes to Radiological Technical Specifications," January 30, 1980.

2. Nebraska Public Power District letter (J. M. Pilant) to USNRC (H. Denton), "Proposed Changes to Technical Specifications," October 30, 1980.

3. License Amendment No. 39 to License DPR-46, October 14, 1977.

4. R. B. Elkins, Fuel Prepressurization, R. B. Elkins, NEDE-23786-1-P, March 1978.

5. Nebraska Public Power District letter (J. M. Pilant) to USNRC (T. Ippolito), December 19, 1980.

7590-01

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-298

NEBRASKA PUBLIC POWER DISTRICT

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 67 to Facility Operating License No. DPR-46, issued to Nebraska Public Power District, which revised the 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 revises the Technical Specifications to establish MAPLHGR limits for the 7x7 (types 2 and 3) and 8x8 (types 8D250 and 8D274) fuel assemblies for exposure values beyond those currently given in the Technical Specifications.

The application for the amendment complies with the standards and reqiurements 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 regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR Section 51.5(d)(4), an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated January 1, 1980, as supplemented October 30, 1980, (2) Amendment No. 67 to License No. DPR-46, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C., and at the Auburn Public Library, 118 - 15th Street, Auburn, Nebraska 68305. A copy of items (2) and (3) may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Licensing.

Dated at Bethesda, Maryland, this 30th day of January 1981.

FOR THE NUCLEAR REGULATORY COMMISSION

Thomas A. Ippolito, Chief
Operating Reactors Branch #2
Division of Licensing