APR 21 1982

Docket No. 50-305

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Mr. Eugene R. Mathews, Vice President
Power and Supply and Engineering
Wisconsin Public Service Corporation
Post Office Box 1200
Green Bay, Wisconsin 54305

Dear Mr. Mathews:

The Commission has issued the enclosed Amendment No. 40 to Facility Operating License No. DPR-43 for Kewaunee Nuclear Power Plant. The amendment consists of changes to the Technical Specifications in response to your application transmitted by letter dated August 7, 1981.

The amendment revises the Technical Specifications in respect to Heatup and Cooldown Limit Curves for Normal Operation.

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

Sincerely,

ORIGINAL SIGNED

Robert B. A. Licciardo, Project Manager
Operating Reactors Branch #1
Division of Licensing

Enclosures:
1. Amendment No. 40 to DPR-43
2. Safety Evaluation
3. Notice of Issuance

cc w/encls:
See next page

CONCURRENCE AS REQD, IS AS TO FORM OF AMENDMENT AND F.R. NOTICE ONLY

OFFICE	DL:ORB#1	DL:ORB#1	DL:ORB#1	DL:DR	OELD		
SURNAME	CParrish	RALicciardo/ms	SAVarga	TMNovak			
DATE	4/19/82	4/17/82	4/18/82	4/21/82	4/16/82		

Mr. Eugene R. Mathews
Wisconsin Public Service Corporation

cc: Steven E. Keane, Esquire
Foley and Lardner
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Kewaunee Public Library
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Stanley LaCrosse, Chairman
Town of Carlton
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Mr. Donald L. Quistroff, Chairman
Kewaunee County Board
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Kewaunee, Wisconsin 54216

Chairman
Public Service Commission of Wisconsin
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Madison, Wisconsin 53702

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Regional Radiation Representative
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

WISCONSIN PUBLIC SERVICE CORPORATION
WISCONSIN POWER AND LIGHT COMPANY
MADISON GAS AND ELECTRIC COMPANY

DOCKET NO. 50-305

KEWAUNEE NUCLEAR PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 40
License No. DPR-43

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

   A. The application for amendment by Wisconsin Public Service Corporation, Wisconsin Power and Light Company and Madison Gas and Electric Company (the licensee) dated August 7, 1981, 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. 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-43 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 40 , 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

Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 21, 1982

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 40 TO FACILITY OPERATING LICENSE NO. DPR-43

DOCKET NO. 50-305

Revise Appendix A as follows:

Remove Pages	Insert Pages
TS 3.1-3	TS 3.1-3
TS 3.1-6	TS 3.1-6
TS 3.1-7	TS 3.1-7
TS 3.1-8	--
Figure TS 3.1-1	Figure TS 3.1-1
Figure TS 3.1-2	Figure TS 3.1-2

b. HEATUP AND COOLDOWN LIMIT CURVES FOR NORMAL OPERATION

Specification

1. The reactor coolant temperature and pressure and system heatup and cooldown rates (with the exception of the pressurizer) shall be limited in accordance with Figures TS 3.1-1 and TS 3.1-2 for the service period up to 10 equivalent fullpower years.

   a. Allowable combinations of pressure and temperature for specific temperature change rates are below and to the right of the limit lines shown. Limit lines for cooldown rates between those presented may be obtained by interpolation.

   b. Figures TS 3.1-1 and TS 3.1-2 define limits to assure prevention of non-ductile failure only. For normal operation other inherent plant characteristics, e.g., pump heat addition and pressurizer heater capacity may limit the heatup and cooldown rates that can be achieved over certain pressure-temperature ranges.

2. The secondary side of the steam generator must not be pressurized above 200 psig if the temperature of the steam generator is below 70°F.

3. The pressurizer cooldown and heatup rates shall not exceed 200°F/hr and 100°F/hr, respectively. The spray shall not be used if the temperature difference between the pressurizer and the spray fluid is greater than 320°F.

induced during cooldown tend to produce tensile stresses at the ID location and compressive stresses at the OD position. Thus, the ID flaw is clearly the worst case.

As in the case of heatup, allowable pressure-temperature relations are generated for both steady-state and finite cooldown rate situations. Composite limit curves are then constructed for each cooldown rate of interest. Again adjustments are made to account for pressure and temperature instrumentation error.

The use of the composite curve in the cooldown analysis is necessary because system control is based on a measurement of reactor coolant temperature, whereas the limiting pressure is calculated using the material temperature at the tip of the assumed reference flaw. During cooldown, the 1/4T vessel location is at a higher temperature than the fluid adjacent to the vessel ID. This condition, of course, is not true for the steady-state situation. It follows that the ΔT induced during cooldown results in a calculated higher K_{IR} for finite cooldown rates than for steady-state under certain conditions.

Limit curves for normal heatup and cooldown of the primary reactor coolant system have been calculated using the methods discussed above. The derivation of the limit curves is consistent with NRC Regulatory Standard Review Plan Directorate of Licensing, Section 5.3.2 "Pressure-Temperature Limits" 1974 in Reference (1).

Transition temperature shifts occurring in the pressure vessel materials due to radiation exposure have been obtained directly from the reactor pressure vessel surveillance program. Weld metal Charpy test specimens for Capsule R indicate that the core region weld metal exhibits the largest shift in RT_{NDT} ($235^{o}F$). The capsule experienced equivalent dose of 10 effective fullpower years, as presented in WCAP 9878.

The results of Irradiation Capsules V and R analyses are presented in WCAP 8908 and WCAP 9878, respectively. Heatup and cooldown limit curves for normal operation of the reactor vessel are presented in Figures TS 3.1-1 and TS 3.1-2 and represent an operational time period of 10 effective fullpower years.

Pressure Limits

Although the pressurizer operates at temperature ranges above those for which there is reason for concern about brittle fracture, operating limits are provided to assure compatibility of operation with the fatigue analysis performed in accordance with Code requirements. In-plant testing and calculations have shown that a pressurizer heatup rate of 100°F/hr cannot be achieved with the installed equipment.

REFERENCES

1. ASME Boiler and Pressure Vessel Code, "Nuclear Power Plant Components" Section III, Summer 1972 Addenda, Non-Mandatory Appendix G - "Protection Against Non-ductile Failure."

2. Standard Method for Measuring Thermal Neutron Flux by Radioactivation Techniques, ASTM designation E262-70, 1975 Book of ASTM Standards, Part 45, pp. 756-763.

3. W. S. Hazelton, S. L. Anderson, and S. E. Yanichko, "Basis for Heatup and Cooldown Limit Curves," WCAP 7924, July 1972.

4. S. E. Yanichko, S. L. Anderson, and K. V. Scott, "Analysis of Capsule V from the Wisconsin Public Service Corporation Kewaunee Nuclear Plant Reactor Vessel Radiation Surveillance Program," WCAP 8908, January 1977.

5. S. E. Yanichko, et al, "Analysis of Capsule R from the Wisconsin Public Service Corporation Kewaunee Nuclear Plant Reactor Vessel Radiation Surveillance Program," WCAP 9878, March, 1981.

6. Letter from P. S. VanTeslaar (Westinghouse) to C. W. Giesler (WPS) dated April 30, 1981, transmitting KNPP Heatup and Cooldown curves based on Capsule R results.

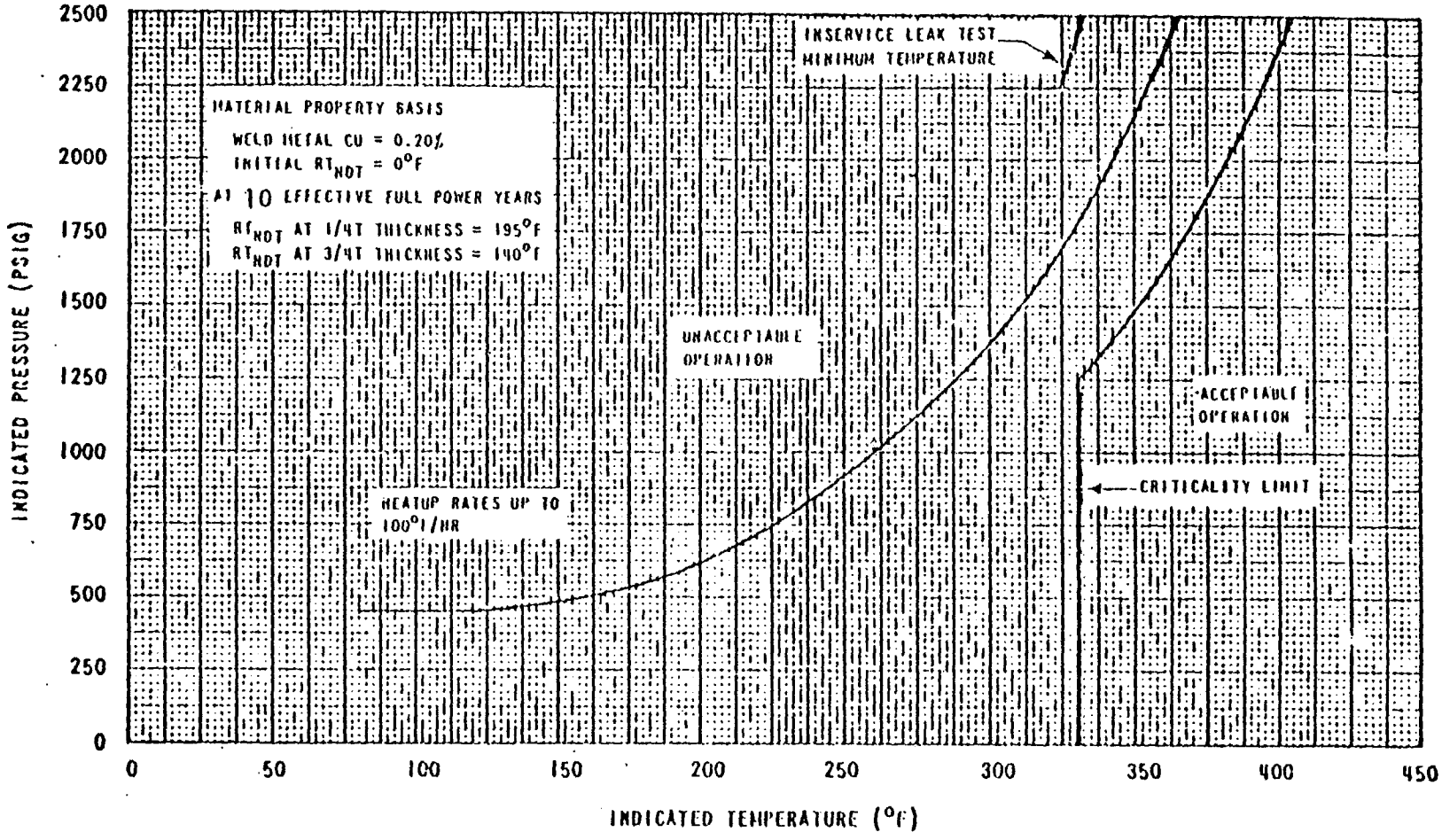

Figure TS 3.1-1 Kewaunee Reactor Coolant System Heatup Limitations Applicable for Periods up to 10 Effective Full Power Years. Margins of 60 PSIG and 10°F are Include for Possible Instrument Error

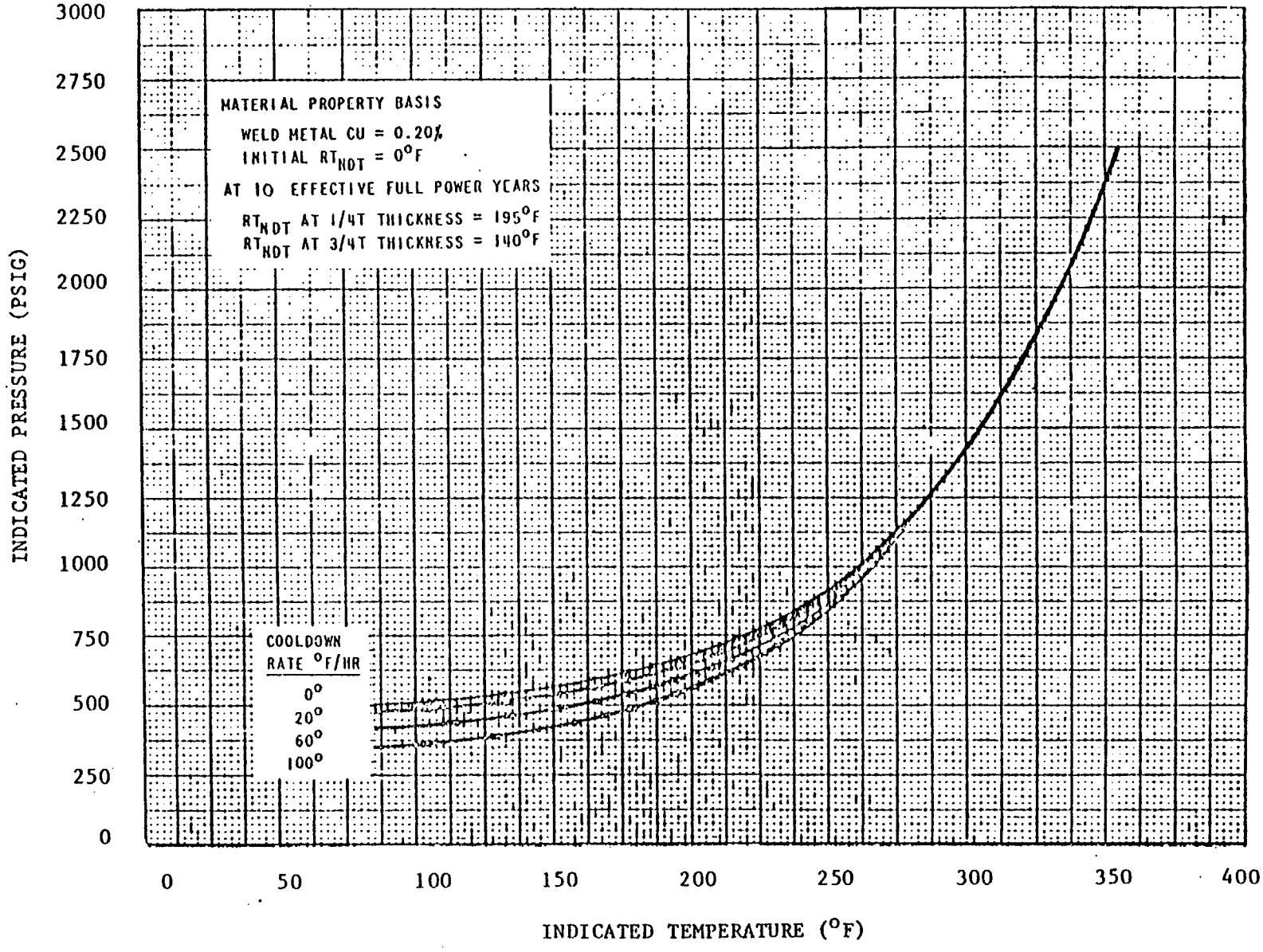

Figure TS 3.1-2 Kewaunee Reactor Coolant System Cooldown Limitations Applicable for Periods up to 10 Effective Full Power Years. Margins of 60 PSIG and 10°F are Included for Possible Instrument Error.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 40 TO FACILITY OPERATING LICENSE NO. DPR-43

WISCONSIN PUBLIC SERVICE CORPORATION

WISCONSIN POWER AND LIGHT COMPANY

MADISON GAS AND ELECTRIC COMPANY

KEWAUNEE NUCLEAR POWER PLANT

DOCKET NO. 50-305

Introduction

By letter of August 7, 1981, Wisconsin Public Service Corporation (the licensee) transmitted the surveillance report on Capsule R (WCAP 9878) and requested an amendment to the Technical Specifications for Kewaunee, including new heatup and cooldown limit curves for normal operation. Figures TS 3.1-1 and 3.1-2 provide limits for a period of 10 effective full power years, approximately 4 EFPY from the present. The caption on the Figures states:

> "Material Property Basis:
>
> Weld Metal Cu = 0.20%
> Initial RT_{NDT} = 0°F
> At 10 Effective Full Power Years,
> RT_{NDT} at 1/4 T thickness = 195°F
> RT_{NDT} at 3/4 T thickness = 140°F"

From Figure 2 of the attachment to the August 7, 1981 letter, the neutron fluence values after 10 EFPY were given as 8.3×10^{18} n/cm^2 (E>1 MeV) at the 1/4 T position and 2.7×10^{18} n/cm^2 (E>1 MeV) at the 3/4 T position.

Evaluation

The basis for checking the fluence values and the values of RT_{NDT} given above was the surveillance reports for Capsule V (WCAP 8908) and Capsule R (WCAP 9878) and the materials information submitted to the NRC by letters dated October 11, 1977 and February 1, 1978.

The fluence estimate, 8.3×10^{18} n/cm^2 (E>1 MeV), at the 1/4 T position of the beltline circumferential weld (there are no longitudinal welds) is consistent with our sources of information and is accepted. Using Reg. Guide 1.99 Rev. 1, the predicted shift, ΔRT_{NDT}, for that fluence and a copper content of 0.20% is 165°F. This is less than that indicated by the surveillance results. The reported copper content may be low. The welds for 12 other vessels made by Combustion Engineering averaged 0.32% copper, the lowest being 0.24%. Therefore, the surveillance results were used directly to check the ΔRT_{NDT} value. We find by interpolation a value of 190°F at a fluence of 8.3×10^{18} n/cm^2. Incidentally, the surveillance results are consistent with the result obtained from a mean curve fitted to the PWR surveillance data base for 0.30% Cu and 0.77% Ni.

The initial RT_{NDT} reported by WPSC is 0°F, which was not a measured value, but was estimated using SRP 5.3.2. From generic information about the type of weld wire and weld flux used, we find that value to be acceptable.

We conclude that the value of RT_{NDT} for the 1/4 T position (195°F), and the value of 140°F for the 3/4 T position, after 10 EFPY, given on Figures TS 3.1-1 and -2, are acceptable.

The pressure-temperature limits given in Figures TS 3.1-1 and -2 were checked against the requirements of Appendix G, 10 CFR Part 50, for the fracture toughness of the beltline and the flange areas. The staff has found that Figures TS 3.1-1 and -2 are acceptable for operating up to 10 EFPY as proposed.

Environmental Consideration

We have determined that the 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 the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §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.

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.

Date: April 21, 1982

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-305

WISCONSIN PUBLIC SERVICE CORPORATION

WISCONSIN POWER AND LIGHT COMPANY

MADISON GAS AND ELECTRIC COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 40 to Facility Operating License No. DPR-43, issued to Wisconsin Public Service Corporation, Wisconsin Power and Light Company, and Madison Gas and Electric Company (the licensees), which revised Technical Specifications for operation of the Kewaunee Nuclear Plant (the facility) located in Kewaunee, Wisconsin. The amendment is effective as of the date of issuance.

The amendment revises the Technical Specifications in respect to Heatup and Cooldown Limit Curves for Normal Operation.

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. Prior public notice of this amendment was not required since this 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 §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 August 7, 1981, (2) Amendment No. 40 to License No. DPR-43 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, NW., Washington, D. C. and at the Kewaunee Public Library, 314 Milwaukee Street, Kewaunee, Wisconsin 54216. 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 21st day of April, 1982.

FOR THE NUCLEAR REGULATORY COMMISSION

Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing