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NOV 08 1982

Mr. D. M. Musolf
Nuclear Support Services Department
Northern States Power Company
414 Nicollet Mall - 8th Floor
Minneapolis, Minnesota 55401

NOV 30 1982

Dear Mr. Musolf:

The Commission has issued the enclosed Amendment No. 12 to Facility Operating License No. DPR-22 for the Monticello Nuclear Generating Plant. The amendment consists of changes to the Technical Specifications in response to your September 24, 1982 application and subsequent discussions between the NRC and your staff. Changes to the proposed Technical Specifications were discussed with, and agreed to, by your staff.

The amendment authorizes changes to the Technical Specifications to incorporate Limiting Conditions for Operation and Surveillance Requirements associated with the reactor protection monitoring system. Other changes requested in the September 24, 1982 submittal are still under staff review and will be addressed by separate Safety Evaluation and license amendment.

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

Sincerely,

ORIGINAL SIGNED BY
Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing

Enclosures:
1. Amendment No. 12 to DPR-22
2. Safety Evaluation
3. Technical Evaluation Report
4. Notice of Issuance

cc w/enclosures: See next pg.

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SURNAME	SNorris	HNicolaras	JVan Vliet	DVassallo	GLainas	LBachmann	
DATE	11/22/82	11/23/82:cb	11/23/82	11/23/82	11/29/82	11/24/82	

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Mr. D. M. Musolf
Northern States Power Company

cc:

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

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-263

MONTICELLO NUCLEAR GENERATING PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.12
License No. DPR-22

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

   A. The application for amendment by Northern States Power Company (the licensee) dated September 24, 1982 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-22 is hereby amended to read as follows:

   2. Technical Specifications

      The Technical Specifications contained in Appendices A and B as revised through Amendment No.12 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: November 30, 1982

ATTACHMENT TO LICENSE AMENDMENT NO. 12

FACILITY OPERATING LICENSE NO. DPR-22

DOCKET NO. 50-263

Revise the Appendix A Technical Specifications by removing page 27 and inserting revised page 27.

3.0 LIMITING CONDITIONS FOR OPERATION	4.0 SURVEILLANCE REQUIREMENTS
B. Upon discovery that the requirements for the number of operable or operating trip systems or instrument channels are not satisfied, action shall be initiated to: 1. Satisfy the minimum requirements by placing appropriate devices, channels, or trip systems in the tripped condition, or 2. Place and maintain the plant under the specified required conditions using normal operating procedures	B. Once per day during power operation the MFLPD (Maximum Fraction of Limiting Power Density) shall be checked and the scram setting given by the equation in Specification 2.3.A shall be adjusted if necessary.
C. RPS Power Monitoring System 1. Except as specified below, both channels of the power monitoring system for the MG set or alternate source supplying each reactor protection system bus shall be operable with the following setpoints: Time Delay a. Over-voltage - ≤128 VAC ≤100 milliseconds b. Under-voltage - ≥104 VAC ≤100 milliseconds c. Under-frequency - ≥57 HZ ≤100 milliseconds 2. With one RPS electric power monitoring channels for the MG set or alternate source supplying each reactor protection system bus inoperable, restore the inoperable channel to Operable status within 72 hours or remove the associated RPS MG set or alternate power supply from service. 3. With both RPS electric power monitoring channels for the MG set or alternate source supplying each reactor protection system bus inoperable, restore at least one to Operable status within 30 minutes or remove the associated RPS MG set or alternate power supply from service.	C. RPS Power Monitoring System 1. Instrument Functional Tests of each RPS power monitoring channel shall be performed at least once every six months. 2. At least once each Operating Cycle an Instrument Calibration of each RPS power monitoring channel shall be performed to verify over-voltage, under-voltage, and under-frequency setpoints.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 12 TO FACILITY OPERATING

LICENSE NO. DPR-22

NORTHERN STATES POWER COMPANY

MONTICELLO NUCLEAR GENERATING PLANT

DOCKET NO. 50-263

1.0 Introduction

Our concerns regarding the deficiencies in the existing design of reactor protection system (RPS) power monitoring in BWRs was transmitted to Northern States Power Company (the licensee) by NRC Generic Letter dated September 24, 1980. In response to this, by letters dated November 12, 1980, April 24, 1981, March 23, 1982 and May 17, 1982, the licensee proposed design modifications and draft changes to the Technical Specifications. By letter dated September 24, 1982, the licensee proposed changes to the Technical Specifications of Facility Operating License No. DPR-22 for the Monticello Nuclear Generating PLant. A detailed review and Technical Evaluation of these proposed modifications and Technical Specification changes was performed by Lawrence Livermore Laboratory (LLL) under contract to the NRC, and with general supervision by NRC staff. This work is reported in LLL report UCID-19145 "Technical Evaluation of the Monitoring of Electric Power to the Reactor Protection System" dated July 1982 (enclosed).

2.0 Proposed Changes and Evaluation Criteria

The following design modifications and Technical Specification changes were proposed by the licensee:

1. Installation of General Electric (GE) designed protection assemblies, two in each of the three sources of power to the RPS (RPS M-G sets A and B and the one alternate source). Each assembly includes a circuit breaker and a monitoring module consisting of an undervoltage, overvoltage and an underfrequency sensing relay.

2. The licensee also proposed the addition of trip setpoints, Limiting Condition for Operation and Surveillance Requirements in the Technical Specification associated with the design modifications cited above.

The criteria used by LLL in its Technical Evaluation of the proposed changes includes General Design Criteria (GDC) 2 "Design Basis for Protection Against Natural Phenomenon", and GDC 21, "Protection System Reliability and Testability", of Appendix A to 10 CFR Part 50; IEEE-279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations"; and NRC memorandum from F. Rosa to J. Stolz, T. Ippolito and G. Lainas dated February 19, 1979.

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3.0 Summary

We have reviewed the LLL Technical Evaluation Report and concur in its findings that: (1) the proposed modifications will provide automatic protection to the RPS components from sustained abnormal power supply and (2) the proposed changes to the Technical Specifications include acceptable Limiting Conditions for Operation and periodic testing in accordance with the Standard Technical Specifications for BWRs. Therefore, we conclude that the licensee's proposed design modifications and changes to Technical Specifications are acceptable.

4.0 Environmental Considerations

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 the amendment.

5.0 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 an accident previously evaluated, does not create the possibility of an accident of a type different from any evaluated previously, and does not involve a significant reduction in a margin of safety, 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: November 30, 1982

Principal Contributor: I. Ahmed.

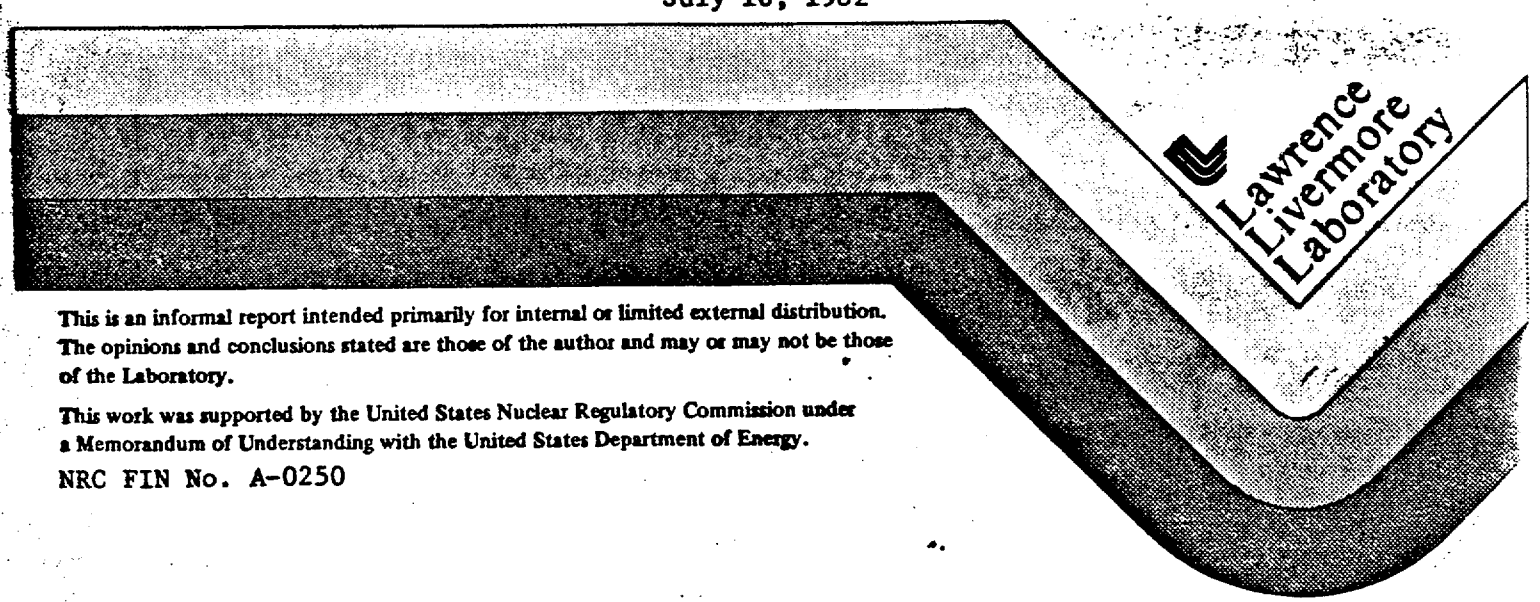
UCID-19145

TECHNICAL EVALUATION REPORT ON THE MONITORING OF ELECTRIC POWER TO THE REACTOR PROTECTION SYSTEM FOR THE MONTICELLO NUCLEAR GENERATING PLANT

(Docket No. 50-263)

James C. Selan

July 16, 1982



This is an informal report intended primarily for internal or limited external distribution. The opinions and conclusions stated are those of the author and may or may not be those of the Laboratory.

This work was supported by the United States Nuclear Regulatory Commission under a Memorandum of Understanding with the United States Department of Energy.

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Available from: National Technical Information Service - U.S. Department of Commerce
5285 Port Royal Road - Springfield, VA 22161 - $6.00 per copy - (Microfiche $3.50)

ABSTRACT

This report documents the technical evaluation of the monitoring of electric power to the reactor protection system (RPS) at the Monticello Nuclear Generating Plant. The evaluation is to determine if the proposed design modification will protect the RPS from abnormal voltage and frequency conditions which could be supplied from the power supplies and will meet certain requirements set forth by the Nuclear Regulatory Commission.

The proposed design modifications will protect the RPS from sustained abnormal voltage and frequency conditions from the supplying sources.

FOREWORD

This report is supplied as part of the Selected Electrical, Instrumentation, and Control Systems Issues Program being conducted for the U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Division of Licensing, by Lawrence Livermore National Laboratory.

The U. S. Nuclear Regulatory Commission funded the work under the authorization entitled "Electrical, Instrumentation and Control System Support," B&R 20 19 04 031, FIN-A0250.

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TECHNICAL EVALUATION REPORT ON THE MONITORING OF ELECTRIC POWER TO THE REACTOR PROTECTION SYSTEM AT THE MONTICELLO NUCLEAR GENERATING PLANT

(Docket No. 50-263)

James C. Selan

Lawrence Livermore National Laboratory, Nevada

1. INTRODUCTION

During the operating license review for Hatch 2, the Nuclear Regulatory Commission (NRC) staff raised a concern about the capability of the Class 1E reactor protection system (RPS) to operate after suffering sustained, abnormal voltage or frequency conditions from a non-Class 1E power supply. Abnormal voltage or frequency conditions could be produced as a result of one of the following causes: combinations of undetected, random single failures of the power supply components, or multiple failures of the power supply components caused by external phenomena such as a seismic event.

The concern for the RPS power supply integrity is generic to all General Electric (GE) boiling water reactors (BWR) MARK 3's, MARK 4's, and MARK 5's and all BWR MARK 6's that have not elected to use the solid state RPS design. The staff therefore pursued a generic resolution. Accordingly, GE proposed a revised design, in conceptual form, for resolution of this concern [Ref. 1]. The proposed modification consists of the addition of two Class 1E "protective packages" in series between each RPS motor-generator (M-G) set and it's respective RPS bus, and the addition of two similar packages in series in the alternate power source circuit to the RPS buses. Each protective package would include a breaker and associated overvoltage, undervoltage and underfrequency relaying. Each protective package would meet the testability requirements for Class 1E equipment.

With the protective packages installed, any abnormal output type failure (undetectable random or seismically caused) in either of the two RPS M-G sets (or the alternate supply) would result in a trip of either one or both of the two Class 1E protective packages. This tripping would interrupt the power to the effected RPS channel, thus producing a scram signal on that channel, while retaining full scram capability by means of the other channel. Thus, fully redundant Class 1E protection is provided, bringing the overall

RPS design into full conformance with General Design Criteria (GDC)-2 [Ref. 2], and GDC-21 [Ref. 3] (including IEEE-279 [Ref. 4] and the Standard Review Plan [Ref. 5]). The NRC staff reviewed the proposed GE design and concluded that the modification was acceptable [Ref. 6], and should be implemented in conformance with the applicable criteria for Class 1E systems.

The NRC requires that the components of the RPS not be exposed to unacceptable electric power of any sustained abnormal quality that could damage the RPS. This involves providing means to detect any overvoltage, undervoltage, or underfrequency condition that is outside the design limits of the RPS equipment and to disconnect the RPS from such abnormal electric power before damage to the RPS can occur. The equipment which performs these functions must satisfy the single failure criterion and be seismically qualified. The NRC issued a generic letter [Ref. 7] to all operating BWR's requesting the licensees to submit design modification details and Technical Specifications for post implementation review.

By letters dated November 12, 1980 [Ref. 8], April 24, 1981 [Ref. 9], March 23, 1982 [Ref. 10], and May 17, 1982 [Ref. 11], Northern States Power Company (NSP), the licensee, submitted design modification details regarding the monitoring of electrical power to the RPS at the Monticello Nuclear Generating Plant.

The purpose of this report is to evaluate the licensee's submittal with respect to the NRC criteria and present the reviewer's conclusion on the adequacy of the design modifications to protect the RPS from abnormal voltage and frequency conditions.

2. DESIGN DESCRIPTION

The licensee has proposed to install the GE designed "electrical protection assembly" (GE No. 914E175) to monitor the electric power in each of the three sources of power (RPS M-G sets A and B, and the alternate source) to the RPS. Each assembly consists of two identical and redundant packages. Each package includes a circuit breaker and a monitoring module. When abnormal electric power is detected by either module, the respective circuit breaker will trip and disconnect the RPS from the abnormal power source.

The monitoring module detects overvoltage, undervoltage, and underfrequency conditions and provides a time-delayed trip when a setpoint is exceeded.

3. EVALUATION

The NRC stated several requirements that the licensee must meet in their design modification to monitor the power to the RPS. A statement of these requirements followed by an evaluation of the licensee's submittals is as follows:

(1) "The components of the RPS shall not be exposed to unacceptable electric power of any sustained abnormal quality that could damage the RPS."

The monitoring module will detect overvoltage, undervoltage, and underfrequency conditions with the following setpoints. The chosen setpoints are within the ratings of the RPS components and thus ensure their protection from sustained abnormal power:

Nominal voltage 116 volts, 60 Hz nominal

Condition	Setpoint	Time Delay
Overvoltage	$\leq$ 128 volts	.10 second
Undervoltage	$\geq$ 104 volts	.10 second
Underfrequency	$\geq$ 57 Hz	.10 second

(2) "Disconnecting the RPS from the abnormal power source shall be automatic."

The monitoring module will automatically disconnect the RPS buses from the abnormal power supply after the set time delay should the parameters setpoints be exceeded.

(3) "The power monitoring system shall meet the requirements of IEEE 279-1971, GDC-2 and GDC-21."

The monitoring packages meet the Class 1E requirements of IEEE 279, the single failure criteria of GDC-21, and the seismic qualifications of GDC-2.

(4) "Technical Specifications shall include limiting conditions of operation, surveillance requirements, and trip setpoints."

The licensee submitted draft Technical Specification changes which included limiting conditions for operation when the number of operable monitoring systems is less than required and surveillance requirements which included a functional test, channel calibration and verification of the trip setpoints.

4. CONCLUSION

Based on the information submitted by Northern States Power Company for the Monticello Nuclear Generating Plant, it is concluded that:

(1) The proposed setpoints of the relays in the two protective packages to be installed in series, in each of the power sources to the RPS buses, will automatically protect the RPS components from sustained abnormal overvoltage, undervoltage, and underfrequency conditions outside the design limits of the RPS components.

(2) The protective packages meet the requirements of Class 1E equipment (IEEE 279), single failure criteria (GDC-21), and seismic qualification (GDC-2).

(3) The proposed time delay before circuit breaker tripping will not result in damage to components of the RPS or prevent the RPS from performing its safety functions.

(4) The following minimum and maximum limits to the trip setpoints, limiting conditions for operation (LCO), and surveillance requirements, to be included in the Technical Specifications, will protect the RPS components from sustained abnormal power:

(a) Overvoltage $\leq$ 128 volts, time delay $\leq$ .10 second

Undervoltage $\geq$ 104 volts, time delay $\leq$ .10 second

Underfrequency $\geq$ 57 Hz, time delay $\leq$ .10 second

(b) An inoperable power monitoring system be restored in 30 minutes or remove the source associated with the inoperable power monitoring system. One package may be inoperable, as necessary for testing and maintenance, not to exceed 8 hours per month.

(c) A functional test at least once per 6 months and a channel calibration once per operating cycle to determine the operability of the protective instrumentation including simulated automatic actuation, tripping logic, output circuit breaker tripping, and verification of the setpoints.

REFERENCES

1. General Electric Company letter, MFN 408-78 (G. G. Sherwood) to NRC (R. S. Boyd), dated October 31, 1978.

2. General Design Criteria-2 (GDC-2), "Design Bases for Protection Against Natural Phenomena," of Appendix A, "General Design Criteria for Nuclear Power Plants," in the Code of Federal Regulations, Title 10, Part 50 (10 CFR 50).

3. General Design Criteria-21 (GDC-21), "Protection System Reliability and Testability," of Appendix A, "General Design Criteria for Nuclear Power Plants," in the Code of Federal Regulations, Title 10, Part 50 (10 CFR 50).

4. IEEE Std. 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations."

5. NUREG-75/087, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants."

6. NRC memorandum from Faust Rosa to J. Stolz, T. Ippolito, and G. Lainas, dated February 19, 1979.

7. NRC letter to Operating BWR's, dated September 24, 1980.

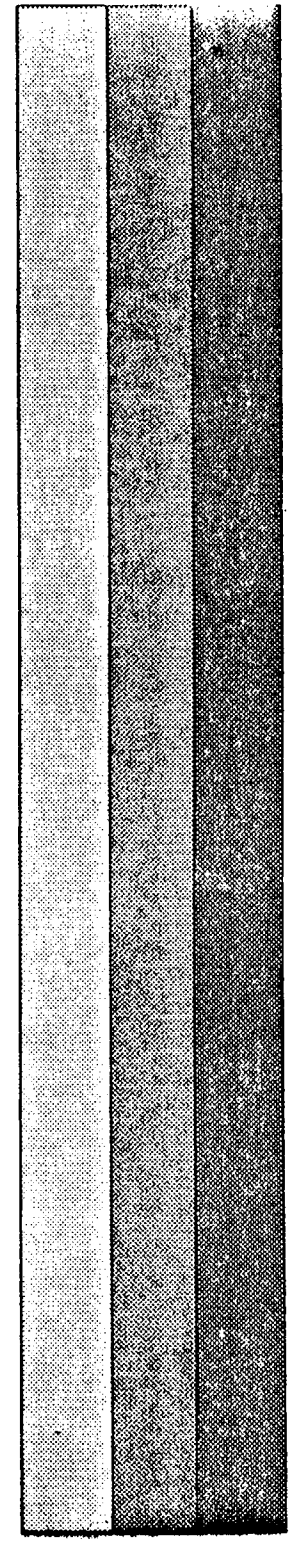
8. NSP letter (L. O. Mayer) to NRC, dated November 12, 1980.

9. NSP letter (L. O. Mayer) to NRC, dated April 24, 1981.

10. NSP letter (L. O. Mayer) to NRC, dated March 23, 1982.

11. NSP letter (L. O. Mayer) to NRC, dated May 17, 1982.

Technical Information Department · Lawrence Livermore Laboratory
University of California · Livermore, California 94550



UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-263

NORTHERN STATES POWER COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 12 to Facility Operating License No. DPR-22, issued to Northern States Power Company, which revised the Technical Specifications for operation of the Monticello Nuclear Generating Plant (the facility) located in Wright County, Minnesota. The amendment is effective as of its date of issuance.

The amendment authorizes changes to the Technical Specifications to incorporate Limiting Conditions for Operation and surveillance requirements associated with the reactor protection monitoring system.

The application for 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 the 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 51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of the amendment.

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For further details with respect to this action, see (1) the application for amendment dated September 24, 1982, (2) Amendment No. 12 to License No. DPR-22, 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 Environmental Conservation Library, Minneapolis Public Library, 300 Nicollet Mall, Minneapolis, Minnesota. 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 November, 1982

FOR THE NUCLEAR REGULATORY COMMISSION

Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing