July 15, 1994

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Docket No. 50-305

Mr. C. A. Schrock
Manager - Nuclear Engineering
Wisconsin Public Service Corporation
Post Office Box 19002
Green Bay, Wisconsin 54307-9002

Dear Mr. Schrock:

SUBJECT: AMENDMENT NO. 109 TO FACILITY OPERATING LICENSE NO. DPR-43 (TAC NO. M88379)

The Commission has issued the enclosed Amendment No. 109 to Facility Operating License No. DPR-43 for the Kewaunee Nuclear Power Plant (KNPP). This amendment revises the Technical Specifications (TS) in response to your application dated December 7, 1993.

The amendment revises TS 5.3.a.1 to provide flexibility in the repair of fuel assemblies containing damaged and leaking fuel rods by reconstituting the assemblies, provided that an NRC-approved methodology is used. This change is consistent with guidance provided in Supplement 1 to Generic Letter (GL) 90-02, "Alternative Requirements for Fuel Assemblies in the Design Features Section of Technical Specifications," dated July 31, 1992. In addition, administrative changes to KNPP TS Section 5 have been made.

A copy of the Safety Evaluation is also enclosed. Notice of issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

Original signed by Richard J. Laufer

Richard J. Laufer, Acting Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 109 to License No. DPR-43
2. Safety Evaluation



cc w/enclosures:
See next page

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| PD3-3:LA | PD3-3:PM | (A)BC:SRXB * | PD3-3:PD | OGC-OWFN |
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 15, 1994

Docket No. 50-305

Mr. C. A. Schrock
Manager - Nuclear Engineering
Wisconsin Public Service Corporation
Post Office Box 19002
Green Bay, Wisconsin 54037-9002

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Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

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cc w/enclosures:
See next page

cc:

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Chairman
Town of Carlton
Route 1
Kewaunee, Wisconsin 54216

Mr. Harold Reckelberg, Chairman
Kewaunee County Board
Kewaunee County Courthouse
Kewaunee, Wisconsin 54216

Chairman
Public Service Commission of
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Hill Farms State Office Building
Madison, Wisconsin 53702

Attorney General
114 East, State Capitol
Madison, Wisconsin 53702

U. S. Nuclear Regulatory Commission
Resident Inspectors Office
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Kewaunee, Wisconsin 54216

Regional Administrator - Region III
U. S. Nuclear Regulatory Commission
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Lisle, Illinois 60532-4531

Mr. Robert S. Cullen
Chief Engineer
Wisconsin Public Service Commission
P. O. Box 7854
Madison, Wisconsin 53707

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

WISCONSIN PUBLIC SERVICE CORPORATION

WISCONSIN POWER AND LIGHT COMPANY

MADISON GAS AND ELECTRIC COMPANY

DOCKET NO. 50-305

KEWAUNEE NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 109
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 licensees) dated December 7, 1993, 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 Appendix A, as revised through Amendment No. 109, are hereby incorporated in the license. The licensees shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance, and is to be implemented within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

for John B. Hopkins

John N. Hannon, Director
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of issuance: July 15, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 109

FACILITY OPERATING LICENSE NO. DPR-43

DOCKET NO. 50-305

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by amendment number and contain marginal lines indicating the area of change.

| REMOVE | INSERT |
|---|---|
| TS 5.1-1 | TS 5.1-1 |
| TS 5.2-1 | TS 5.2-1 |
| TS 5.2-2 | TS 5.2-2 |
| TS 5.2-3 | TS 5.2-3 |
| TS 5.3-1 | TS 5.3-1 |
| TS 5.3-2 | TS 5.3-2 |
| TS 5.4-1 | TS 5.4-1 |

## 5.0 DESIGN FEATURES

## 5.1 SITE

APPLICABILITY

Applies to the location and extent of the reactor site.

OBJECTIVE

To define those aspects of the site which affect the overall safety of the installation.

SPECIFICATION

The Kewaunee Nuclear Power Plant is located on property owned by Wisconsin Public Service Corporation, Wisconsin Power and Light Company, and Madison Gas and Electric Company at a site on the west shore of Lake Michigan, approximately 30 miles east-southeast of the city of Green Bay, Wisconsin.

The minimum distance from the center line of the reactor containment to the site exclusion radius as defined in 10 CFR 100.3 is 1200 meters.

## 5.2 CONTAINMENT

APPLICABILITY

Applies to those design features of the Containment System relating to operational and public safety.

OBJECTIVE

To define the significant design features of the Containment System.

SPECIFICATION

a. Containment System

1. The Containment System completely encloses the entire reactor and the Reactor Coolant System and ensures that leakage of activity is limited, filtered and delayed such that off-site doses resulting from the Design Basis Accident are within the guidelines of 10 CFR Part 100. The Containment System provides biological shielding for both normal operating conditions and accident situations.

2. The Containment System consists of:

   A. A free-standing steel Reactor Containment Vessel designed for the peak pressure of the Design Basis Accident.

   B. A concrete Shield Building which surrounds the Containment Vessel, providing a Shield Building annulus between the two structures.

   C. A Shield Building Ventilation System which causes leakage from the Reactor Containment Vessel to be delayed and filtered before its release to the environment.

   D. An Auxiliary Building Special Ventilation System which serves the Special Ventilation Zone and supplements the Shield Building Ventilation System during an accident condition by causing any leakage from the RHRS and certain small amounts of leakage which might be postulated to bypass the Shield Building Ventilation System to be filtered before their release.

b. Reactor Containment Vessel

1. The Reactor Containment Vessel is designed for the peak internal pressure of the Design Basis Accident plus the loads resulting from an earthquake producing 0.06g horizontally and 0.04g vertically. It is also designed to withstand an external pressure 0.8 psi greater than the internal pressure.

2. Penetrations of the Containment Vessel for piping, electrical conductors, ducts and access hatches are provided with double barriers against leakage.

3. The automatically actuated containment valves are designed to close upon high containment pressure and on a safety injection signal. The actuation system is designed so that no single component failure will prevent containment isolation, if required.

c. Shield Building

The Shield Building is a reinforced concrete structure with a wall thickness of 2.5 feet and a dome thickness of 2 feet. It is designed for the same seismic conditions as the Reactor Containment Vessel and is designed to resist a 3 psi internal pressure due to tornadoes.

d. Shield Building Ventilation System

In the event of a loss-of-coolant accident, the Shield Building Ventilation System will relieve the initial thermal expansion of air through particulate and charcoal filters and will then cause a vacuum to be produced throughout the Shield Building annulus. A momentary positive pressure no greater than 0.5 psi will result during the thermal expansion. Once vacuum is achieved, the system causes the air within the annulus to be recirculated through the filters while vacuum is maintained. The filtered mixture of annulus air plus leakage is vented through the Containment System Vent by the discharge fan that maintains vacuum at a vent rate determined by inleakage to the Shield Building.[1]

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[1]USAR Section 5.5

e. Auxiliary Building Special Ventilation Zone & Special Ventilation System

A limited amount of containment leakage could potentially escape through certain penetrations in the event of leakage in the isolation valves, as described in the Basis of TS 3.6. The leakage escaping into that portion of the Auxiliary Building which is designed for medium leakage and controlled access would be processed by the Auxiliary Building Special Ventilation System. When actuated, the system will draw all in-leakage air from this Special Ventilation Zone and exhaust it through particulate and charcoal filters to the Auxiliary Building Vent.[2]

[2]USAR Section 9.6

## 5.3 REACTOR

**APPLICABILITY**

Applies to the reactor core and the Reactor Coolant System.

**OBJECTIVE**

To define those design features which are essential in providing for safe system operations.

**SPECIFICATIONS**

a. Reactor Core

1. The reactor core contains approximately 48 metric tons of uranium in the form of slightly enriched uranium dioxide pellets. The pellets are encapsulated in Zircaloy-4 tubing to form fuel rods. The reactor core is made up of 121 fuel assemblies. Each fuel assembly contains 179 fuel rods.[1]

   Limited substitutions of zirconium alloy or stainless steel filler rods for fuel rods, in accordance with NRC-approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff-approved codes and methods and shown by tests or analyses to comply with all fuel safety design bases. A limited number of lead test assemblies that have not completed representative testing may be placed in nonlimiting core regions.

2. The average enrichment of the initial core is a nominal 2.90 weight percent of U-235. Three fuel enrichments are used in the initial core. The highest enrichment is a nominal 3.40 weight percent of U-235.[2]

3. Reload fuel will be similar in physical design to the initial core loading and shall have a maximum enrichment of 49.2 grams of uranium-235 per axial centimeter of fuel assembly.

4. Burnable poison rods are incorporated in reload cores as dictated by core loading patterns and fuel enrichments. The initial core contained 704 poison rods in the form of 8, 12 and 16 rod clusters which were located in vacant rod cluster control tubes. The burnable poison rods consist of borosilicate glass clad with stainless steel.

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[1] USAR Section 3.2.3

[2] USAR Section 3.2.1

5. There are 29 full-length Rod Cluster Control (RCC) assemblies in the reactor core. The full-length RCC assemblies contain a 142-inch length of silver-indium-cadmium alloy clad with stainless steel.

b. Reactor Coolant System

1. The design of the Reactor Coolant System complies with code requirements.[3]

2. All high-pressure piping, components of the Reactor Coolant System and their supporting structures are designed to Class I[4] requirements and have been designed to withstand:

A. The operational basis seismic ground acceleration, 0.06g, acting in the horizontal and 0.04g acting in the vertical planes simultaneously, with stress maintained within code allowable working stresses.

B. The design basis seismic ground acceleration, 0.12g, acting in the horizontal and 0.08g acting in the vertical planes simultaneously with no loss of function.

3. The normal liquid volume of the Reactor Coolant System, at rated operating conditions, is 6,191 cubic feet.

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[3]USAR Table 4.1-9

[4]USAR Appendix B

## 5.4 FUEL STORAGE

APPLICABILITY

Applies to the capacity and storage arrays of new and spent fuel.

OBJECTIVE

To define those aspects of fuel storage relating to prevention of criticality in fuel storage areas.

SPECIFICATION

a. The new fuel pit and spent fuel pool structures including storage racks are designed to withstand anticipated earthquake loadings as Class I[1] structures. The spent fuel pool has a stainless steel liner to ensure against loss of water.

b. The new and spent fuel storage racks are designed to prevent inserting of assemblies in other than the prescribed locations. The fuel is stored vertically in an array with sufficient center-to-center distance between assemblies to assure $k_{eff} \leq 0.95$ even if unborated water were used to fill the pool.

c. The spent fuel pool is filled with borated water at a concentration to match that used in the reactor refueling cavity and refueling canal during refueling operations or whenever there is fuel in the pool.

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[1] USAR Appendix B

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO AMENDMENT NO. 109 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

## 1.0 INTRODUCTION

By letter dated December 7, 1993, the Wisconsin Public Service Corporation (WPSC), the licensee, submitted a request for revision to the Kewaunee Nuclear Power Plant (KNPP) Technical Specifications (TS). The proposed amendment would revise KNPP TS 5.3.a.1 to provide flexibility in the repair of fuel assemblies containing damaged and leaking fuel rods by reconstituting the assemblies, provided that an NRC-approved methodology is used. This proposed change is consistent with guidance provided in Supplement 1 to Generic Letter (GL) 90-02, "Alternative Requirements for Fuel Assemblies in the Design Features Section of Technical Specifications," dated July 31, 1992. In addition, administrative changes to KNPP TS Section 5 have been proposed.

## 2.0 EVALUATION

### TS 5.3.a.1

The licensee's proposal would add the following paragraph to TS 5.3.a.1:

> "Limited substitutions of zirconium alloy or stainless steel filler rods for fuel rods, in accordance with NRC-approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff-approved codes and methods and shown by tests or analyses to comply with all fuel safety design bases. A limited number of lead test assemblies that have not completed representative testing may be placed in non-limiting core regions."

The proposed change provides for the flexibility in the repair of fuel assemblies containing damaged and leaking fuel rods by reconstituting the assemblies, provided an NRC-approved methodology is used. The staff considers an NRC-approved methodology to be any methodology that the staff has explicitly approved in a written safety evaluation, or a plant-specific technical specification basis. That NRC-approved methodology must be used only for the purpose and the scope of the application specified in the

reviewed document as approved or modified in the NRC approval documentation. In general, the scope of application for generic methods is limited to fuel configurations that are represented by fuel assembly test configurations used to validate an approved methodology.

The modification of TS Section 5.0, "Design Features," specifically TS 5.3.a, "Reactor Core," will not result in modifications to fuel assemblies that would have a significant effect on safety because of the necessity to justify such changes using an NRC-approved methodology. This requirement will confirm conformance to existing design limits and that safety analyses criteria are met before operation during the next fuel cycle. Based on the above, and since the licensee's proposed TS change is consistent with the NRC guidance provided in GL 90-02, Supplement 1, the staff finds this change acceptable.

Administrative changes

In addition to the change described above, the licensee is proposing the following administrative changes.

1) A change to TS 5.3.a.4 to update previous wording which described the use of burnable poison rods in the initial core. This paragraph is being revised to state that burnable poison rods are incorporated into reload cores as well.

2) The correction of minor typographical and format inconsistencies associated with converting TS Section 5 to the WordPerfect format. These changes include capitalizing terms and spelling out abbreviations.

The staff has reviewed the changes discussed above and, since they are administrative in nature, provide clarification, and do not alter the intent or interpretation of the TS, the staff finds them acceptable.

## 3.0 STATE CONSULTATION

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

## 4.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding (59 FR 4951). Accordingly, this 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 this amendment.

## 5.0 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.

Principal Contributor: R. Laufer

Date: July 15, 1994