August 13, 2001

Mr. Mark Reddemann
Site Vice President
Kewaunee and Point Beach Nuclear Plants
Nuclear Management Company, LLC
6610 Nuclear Road
Two Rivers, WI 54241

SUBJECT: KEWAUNEE NUCLEAR POWER PLANT - ISSUANCE OF AMENDMENT (TAC NO. MB2205)

Dear Mr. Reddemann:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 156 to Facility Operating License No. DPR-43 for the Kewaunee Nuclear Power Plant (KNPP). This amendment revises the Technical Specifications (TSs) in response to your application dated June 13, 2001.

The amendment revises TS 5.3 to permit lead-test-assemblies to be used, regardless of clad material, as long as the NRC has generically approved the fuel assembly design for use in pressurized water reactors.

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

Sincerely,

/RA/

John G. Lamb, Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-305

Enclosures: 1. Amendment No. 156 to License No. DPR-43
2. Safety Evaluation

cc w/encls: See next page

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DATE	7/2/01	7/5/01	7/10/01	8/7/01	8/8/01

OFFICIAL RECORD COPY

Kewaunee Nuclear Power Plant

cc:

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Mr. Gerald Novickis, Chairman
Kewaunee County Board
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NUCLEAR MANAGEMENT COMPANY, LLC

DOCKET NO. 50-305

KEWAUNEE NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 156
License No. DPR-43

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

   A. The application for amendment by Nuclear Management Company, LLC (NMC or the licensee) dated June 13, 2001, 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. 156 , 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

/RA/

Claudia M. Craig, Chief, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: August 13, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 156

FACILITY OPERATING LICENSE NO. DPR-43

DOCKET NO. 50-305

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

REMOVE	INSERT
TS 5.3-1	TS 5.3-1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO AMENDMENT NO. 156 TO FACILITY OPERATING LICENSE NO. DPR-43

NUCLEAR MANAGEMENT COMPANY, LLC

KEWAUNEE NUCLEAR POWER PLANT

DOCKET NO. 50-305

1.0 INTRODUCTION

By application dated June 13, 2001, the Nuclear Management Company, LLC (NMC or the licensee) requested an amendment to the technical specifications (TSs) for the Kewaunee Nuclear Power Plant (KNPP). The proposed amendment would allow lead-test-assemblies to be used, regardless of clad material, as long as the Nuclear Regulatory Commission (NRC) has generically approved the fuel assembly design for use in pressurized water reactors.

2.0 BACKGROUND

The use of VANTAGE+ fuel assembly was approved by the NRC staff in Westinghouse Topical Report WCAP-12610-P-A, "VANTAGE+ Fuel Assembly Reference Core Report." VANTAGE+ fuel assembly design has become the standard fuel design. It is used at many Westinghouse plants and provides improved corrosion resistance, enhanced fuel reliability, and the capability to support future increased discharge burnups.

The licensee intends to use four lead-test-assemblies in the Cycle 25 core reload. These lead-test-assemblies will be Westinghouse VANTAGE+ fuel assemblies. The Westinghouse VANTAGE+ fuel assembly design evolved from the VANTAGE 5 fuel designs. The VANTAGE+ fuel assembly consists of a fuel rod cladding and thimble tube alloy, known as ZIRLO.

KNPP TS 5.3.a, "Reactor Core Fuel Assemblies" states the following:

> The reactor shall contain 121 fuel assemblies. Each assembly shall consist of a matrix of zircaloy clad fuel rods with an initial composition of natural or slightly enriched uranium dioxide (UO2) as fuel material. 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 may be placed in nonlimiting core regions.

Currently, KNPP TS 5.3 names “zircaloy” as an acceptable clad material, but does not name ZIRLO as an acceptable clad material. This proposed change clarifies TS 5.3 to permit lead-test-assemblies to be used, regardless of clad material, as long as the NRC has generically approved the fuel assembly design for use in pressurized water reactors.

The purpose of these lead-test-assemblies is to gather empirical evidence regarding performance of an approved fuel design prior to use as standard fuel in the KNPP reactor core.

3.0 EVALUATION

3.1 ZIRLO Evaluation

The use of ZIRLO cladding in Westinghouse fuel was described in WCAP-12610-P-A, and was approved by the NRC staff for irradiation up to 60,000 MWD/MTU rod average burnup. The safety evaluation concluded that:

a. The mechanical design bases and limits for ZIRLO clad fuel assembly design are the same as those for the previously licensed Zircaloy-4 clad fuel assembly design, except those specified for clad corrosion, which are improved,

b. The neutronic evaluations have shown that ZIRLO clad fuel nuclear design bases are satisfied and that key safety parameter limits are applicable. The nuclear design models and methods accurately describe the behavior of ZIRLO clad fuel,

c. The thermal and hydraulic design bases for ZIRLO clad fuel is unchanged from those of fuel clad with Zircaloy-4,

d. The methods and computer codes used in the analysis on the non-LOCA licensing basis events are valid for ZIRLO clad fuel, and all licensing basis criteria are met,

e. The large break LOCA evaluation model was adapted (without effecting model parameters as approved consistent with Appendix K of 10 CFR Part 50) only to reflect the behavior of the ZIRLO clad material during a LOCA. Consequently, the revised evaluation model satisfies 10 CFR 50.46 and 10 CFR Part 50, Appendix K.

By letter dated June 19, 1991, the NRC documented a teleconference regarding core reloads of advanced design fuel assemblies. The NRC informed the licensee of restrictions on the use of lead-test-assemblies. These restrictions will assure that a lead-test-assembly is not the limiting assembly for loss-of-coolant accident (LOCA) analysis, and that the licensee will not use more than 20 of the lead-test-assemblies in a core reload without performing the required LOCA calculations and modifying the applicable KNPP TSs. The licensee agreed to accept these restrictions on the use of advanced design fuel assemblies. The NRC staff reviewed the loading pattern for Cycle 25 and confirmed that this limitation is satisfied.

In WCAP-12610-P-A, Appendices F and G, Westinghouse demonstrated conformance with the criteria given in 10 CFR 50.46 and 10 CFR Part 50, Appendix K. The evaluation stated that its conclusions were based upon the close similarity between the material properties of the ZIRLO alloy of zirconium to those of other zirconium materials that have been previously approved for use as cladding material. Based on this similarity, the NRC staff found that it is appropriately

conservative to apply the criteria of 10 CFR 50.46 and 10 CFR Part 50, Appendix K, to VANTAGE+ (ZIRLO) fuel applications, including WCAP-12610-P-A, Appendices F and G. The licensee proposes to use lead-test-assemblies with ZIRLO cladding to gather empirical evidence regarding performance of an approved fuel design prior to use as standard fuel in the KNPP reactor core. Since the licensee's proposal is consistent with the letter dated June 19, 1991, and the regulations, and references the NRC staff approved WCAP-12610-P-A, the NRC staff concludes that the use of ZIRLO clad lead-test-assemblies at KNPP is acceptable.

3.2 Technical Specification Evaluation

The licensee proposes to change TS 5.3 to state the following:

> The reactor shall contain 121 fuel assemblies. Each assembly shall consist of a matrix of zircaloy clad fuel rods with an initial composition of natural or slightly enriched uranium dioxide (UO2) as fuel material. 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. Lead-test-assemblies shall be of designs approved by the NRC for use in pressurized water reactors and their clad materials shall be the materials approved as part of those designs.

This proposed change will reduce the licensee's regulatory burden if another advanced design fuel assembly becomes available. This proposed change requires that the lead-test-assemblies shall be of designs approved by the NRC for use in pressurized water reactors and their clad materials shall be the materials approved as part of those designs. Since the licensee's proposal is consistent with the letter dated June 19, 1991, and the regulations, and will reference the NRC staff approved topical report for the advanced design fuel assembly, the NRC staff concludes that the use of lead-test-assemblies and their clad materials for designs approved by the NRC for use in pressurized water reactors is acceptable at KNPP.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to 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

(66 FR 36342). 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.

6.0 CONCLUSION

The staff 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 this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: J. Lamb

Date: August 13, 2001