

March 24, 2005

Mr. Craig W. Lambert
Site Vice President
Kewaunee Nuclear Power Plant
Nuclear Management Company, LLC
N490 Highway 42
Kewaunee, WI 54216-9511

SUBJECT: KEWAUNEE NUCLEAR POWER PLANT - ISSUANCE OF AMENDMENT
RE: ROD POSITION INDICATION (TAC NO. MC3278)

Dear Mr. Lambert:

The U. S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 181 to Facility Operating License No. DPR-43 for the Kewaunee Nuclear Power Plant. This amendment revises the Technical Specifications (TSs) in response to your application dated May 25, 2004 (ML041620503), as supplemented February 10, 2005 (ML050530228).

The amendment revises the TSs by adding the demand step counters to the TSs and adding a note to allow for a soak time subsequent to substantial rod motion for the rods that exceed their position limits before invoking the TS requirements.

Your application also proposed additional changes to add an allowed outage time for the individual rod position indication (IRPI) system of 24 hours with more than one IRPI group inoperable and to add the definition of "immediately" to TS Section 1.0. NRC review and approval of the additional changes was documented in Amendment No. 176, dated September 22, 2004 (ML042730063).

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/

Carl F. Lyon, 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. 181 to
License No. DPR-43
2. Safety Evaluation

cc w/encls: See next page

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cc w/encls: See next page

Distribution w/encls:

GHill (2) FLYon MBarillas
PUBLIC TBoyce (IROB) DCoe
PD 3-1 r/f ACRS TTjader
OGC TKozak, RIII DLPM DPR **Previously concurred
ADAMS ACCESSION NUMBER: **ML050540707** *SE dated 2/7/05
ADAMS PACKAGE NUMBER: **ML050890467** ADAMS TS NUMBER: **ML050880247**

OFFICE	PM:PDIII-1	LA:PDIII-1	SC:SRXB	SC:IROB	OGC	SC:PDIII-1
NAME	FLyon	THarris**	DCoe*	TBoyce	NWildermann	LRaghavan
DATE	03/8/05	3/1/05	2/7/05	03/10/05	03/21/05	03/24/05

OFFICIAL RECORD COPY

Kewaunee Nuclear Power Plant

cc:

John Paul Cowan
Executive Vice President &
Chief Nuclear Officer
Nuclear Management Company, LLC
700 First Street
Hudson, WI 54016

Mr. Jeffery Kitsembel
Electric Division
Public Service Commission of Wisconsin
PO Box 7854
Madison, WI 53707-7854

Plant Manager
Kewaunee Nuclear Power Plant
N490 Highway 42
Kewaunee, WI 54216-9511

Manager, Regulatory Affairs
Kewaunee Nuclear Power Plant
N490 Highway 42
Kewaunee, WI 54216-9511

David Molzahn
Nuclear Asset Manager
Wisconsin Public Service Corporation
600 N. Adams Street
Green Bay, WI 54307-9002

Resident Inspectors Office
U. S. Nuclear Regulatory Commission
N490 Hwy 42
Kewaunee, WI 54216-9511

Regional Administrator
Region III
U. S. Nuclear Regulatory Commission
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4352

Jonathan Rogoff
Vice President, Counsel & Secretary
Nuclear Management Company, LLC
700 First Street
Hudson, WI 54016

Larry L. Weyers
Chairman, President and CEO
Wisconsin Public Service Corporation
600 North Adams Street
Green Bay, WI 54307-9002

David Zellner
Chairman - Town of Carlton
N2164 County B
Kewaunee, WI 54216

NUCLEAR MANAGEMENT COMPANY, LLC

DOCKET NO. 50-305

KEWAUNEE NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 181
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), dated May 25, 2004, as supplemented February 10, 2005, 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. 181, 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 its date of issuance and shall be implemented within 60 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

L. Raghavan, 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: March 24, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 181

FACILITY OPERATING LICENSE NO. DPR-43

DOCKET NO. 50-305

Replace the following pages of the Appendix A Technical Specifications (TSs) with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

TS 3.10-5
TS 3.10-6
TS 3.10-7
TS 3.10-8

INSERT

TS 3.10-5
TS 3.10-6
TS 3.10-7
TS 3.10-8

The following TS Bases pages are provided for information only.

TS B3.10-5
TS B3.10-6
TS B3.10-7
TS B3.10-8
TS B3.10-9

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATING TO AMENDMENT NO. 181 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 May 25, 2004 (Reference 1), and February 10, 2005 (Reference 2), Nuclear Management Company, LLC (NMC, the licensee), requested changes to Kewaunee Nuclear Power Plant (KNPP) Technical Specification (TS) 3.10.e, "Rod Misalignment Limitations" and TS 3.10.f, "Inoperable Rod Position Indicator Channels." Currently, the KNPP TSs allow for one Individual Rod Position Indicator (IRPI) per group or two per bank to be inoperable indefinitely.

The licensee's application proposed to:

- (1) Add a definition to TS 1.0 to define the term "immediately."
- (2) Add TS 3.10.f.2 to allow for more than one rod per group to be out of service for a maximum of 24 hours.

U. S. Nuclear Regulatory Commission (NRC) review and approval of the above two changes was documented in Amendment No. 176, dated September 22, 2004 (ML042730063).

The remaining changes proposed by the licensee in its May 25, 2004, application are addressed in this evaluation. Specifically, the licensee proposes to:

- (1) Add a note to TS 3.10.e and TS 3.10.f to allow for a soak time of up to 1 hour before the position requirements take effect after significant rod motion.
- (2) Reword TS 3.10.f.1 to be consistent with the format of the other additions to the TS.
- (3) Modify the current method of determining rod position to require verification of rod position by movable incore detectors.
- (4) Add a note to TS 3.10.f.1 and TS 3.10.f.4 to allow for separate entry conditions for each inoperable IRPI or demand position indicator.
- (5) Add TS 3.10.f.3 to add requirements if a rod with an inoperable IRPI is moved in excess of 24 steps in one direction since its position was last determined.
- (6) Add TS 3.10.f.4 requiring the demand position indicators to be operable and stating action requirements if the indicators are inoperable.

The supplement, dated February 10, 2005, provided additional information that clarified the

application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on July 6, 2004 (69 FR 40675).

2.0 EVALUATION

2.1 Regulatory Evaluation

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix A, "General Design Criteria (GDC)," provides a list of the minimum design requirements for nuclear power plants. KNPP was designed and constructed to meet the intent of the Atomic Energy Commission's GDC, as originally proposed in July 1967. As such, the applicable GDC for this amendment request is Criterion 13, "Instrumentation and control," which states that instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems.

The staff reviewed the licensee's May 25, 2004, application to verify that the proposed changes comply with the KNPP licensing basis criteria stated in section 7.3 of the Updated Safety Analysis Report. The staff also used Chapter 4.6 of NUREG-0800, "Standard Review Plan (SRP) for the Review of Safety Analysis Reports for Nuclear Power Plants LWR Edition," as guidance during the review (Reference 4).

2.2 Technical Evaluation

The shutdown rod groups together with the control rod groups are capable of shutting the reactor down under all conditions. They are used in conjunction with the adjustment of chemical shim to provide adequate shutdown margin following a reactor trip with the most reactive rod in the fully withdrawn position. During normal power operation, it is desirable to maintain the rods in alignment with their respective banks. This provides consistency with the assumptions of the safety analyses, maintains symmetric neutron flux and power distribution profiles, provides assurance that peaking factors are within acceptable limits, and assures adequate shutdown margin. KNPP has two independent systems to sense and display control rod position. These two systems are the analog system (IRPI) and the digital system (demand position). The analog and digital systems are separate systems and serve as a backup to each other.

The licensee proposes to add a note to TS 3.10.e and TS 3.10.f to allow for a soak time of up to 1 hour before the position requirements take effect after significant rod motion. When the control rods have been moved significantly (≥ 10 steps in one direction in ≤ 1 hour), IRPIs will occasionally differ from the demand position indication by more than the allowed TS limits. With the current TS, the operators recognize that rod alignment requirements may not be met and that IRPI operability requirements are not met. These deviations are attributed to changes in the magnetic permeability of the drive shaft as a function of temperature. As the control rod drive shaft reaches thermal equilibrium, the deviation decreases and returns within limits. The soak time allows the IRPI system to return to thermal equilibrium and indicate the actual rod position. The licensee stated there is a small possibility that an IRPI difference from the

demand position indication is a legitimate indication of a misaligned rod. The plant is analyzed for control rod misalignment and the minimum misalignment for individual rods assumed in the safety analyses is 24 steps. In some cases, a total misalignment from fully withdrawn to full insertion is assumed. Plant safety analyses consider two types of rod misalignment events, static misalignment and a dropped rod. The analyses show that a single dropped rod event without operator intervention does not result in any fuel pin failure. Therefore, the licensee concluded the rod drop event is not time dependent and an additional hour with the misalignment undetected and unmitigated does not adversely impact plant safety. Multiple rod drop events cause the reactor to trip and, therefore, an additional hour would not have any impact on this event. In its letter dated February 10, 2005, NMC committed to include the required information concerning the soak period in plant operating procedures. Additionally, NMC committed to develop an alarm on the plant process computer system to track the elapsed time an IRPI exceeds its alignment limit and produce an alarm within the 1-hour period to ensure the operators are alerted to the condition. The staff finds the proposed amendment acceptable since the 1 hour allowance for soak time does not adversely impact plant safety and the specified acceptable fuel design limits will continue to be met.

NMC proposed to reword TS 3.10.f.1 to incorporate other additions to the TS. The current KNPP TS 3.10.f.1 contains requirements indicating that the TS is applicable during operation between 50 and 100 percent rated power, states the frequency of verifying a rod's position with inoperable IRPI, and states that the rod position must be verified if it is moved by 24 steps or more. The licensee is making editorial changes to the requirements to be consistent with NUREG-1431, "Standard Technical Specifications [STS] for Westinghouse Plants," and relocates the requirements within TS 3.10.f. The staff finds the proposed change acceptable since it is an editorial change that has no effect in the current licensing basis, and the current requirements continue to be met.

NMC proposes to modify the current method of determining rod position to require verification of rod position by movable incore detectors. This change modifies the current KNPP licensing basis. Current KNPP TS state that if an IRPI is inoperable, the position of the control rod cluster shall be checked indirectly by core instrumentation (excore detector and/or thermocouples and/or movable incore detectors). NMC is requesting to modify the position verification such that the determination of rod position will be performed using the movable incore detectors. If the rod(s) are moved by more than 24 steps in one direction, TS 3.10.f.3 is applied and the rod(s) position is once again verified by movable incore detectors. This provides more restrictive requirements than the current KNPP TS. The staff finds this acceptable since it is a more conservative action than is currently in place and does not cause a reduction in safety margin.

NMC proposes to add a note to TS 3.10.f.1 and TS 3.10.f.4 to allow for separate entry conditions for each IRPI or demand position indicator found to be inoperable. This action is consistent with NUREG-1431, and the required actions for each separate condition provide appropriate compensatory measures for each inoperable IRPI. Therefore, the staff finds it acceptable.

NMC proposes to add TS 3.10.f.3.A as a requirement concerning the movement of a rod with an inoperable IRPI in excess of 24 steps in one direction since its position was last determined. The proposed actions require that if one or more rods with inoperable position indicators have been moved in excess of 24 steps in one direction since the position was last determined, the

licensee must verify the position of the rod with the inoperable rod position indicator by using movable incore detectors within 4 hours or reduce thermal power to # 50 percent rated power within 8 hours. The purpose is to avoid undesirable power distributions that could result from continued operation at > 50 percent rated power, if one or more rods are misaligned by more than 24 steps. With respect to completion time, the licensee stated that requiring the use of the movable incore detectors to determine rod position is a more stringent requirement than that currently in place. The movable incore detectors provide a higher degree of accuracy, but require a longer time to provide the rod's position. NMC reviewed the ability to complete the determination of rod position using the movable incore detectors and determined it can be accomplished within 4 hours. The staff finds this acceptable since the method to determine rod position is a more stringent method and the 8 hour completion time for power reduction is a reasonable time, based on operating experience for reducing power to # 50 percent rated power without challenging plant safety systems and without causing the reactor core to operate outside the limits of the core operating limit report.

NMC proposes to add TS 3.10.f.4 requiring the demand position indicators to be operable and stating actions if the indicators are inoperable. This addition places requirements that are more restrictive on KNPP operation than those required by current KNPP TS, and are consistent with the wording in NUREG-1431. With one demand position indicator per bank inoperable, the licensee is required to verify by administrative means that the IRPIs for the affected banks are operable and that the most withdrawn rod and the least withdrawn rod of the affected banks are #12 steps apart within the allowed completion time of once every 8 hours. The alternate action, reduction of thermal power to # 50 percent rated power, places the core into a condition where rod position is not significantly affecting core peaking factor limits. The allowed completion time of 8 hours provides an acceptable period of time to verify the rod positions or reduce power to #50 percent rated power. The staff finds this change acceptable since it is a more conservative action than is currently in place at KNPP and it does not cause a reduction in safety margin.

In its May 25, 2004, application, NMC also proposed to add a note to TS 3.10.f that would allow a substitution for verification of rod position by movable incore detectors. In its letter dated February 10, 2005, the licensee withdrew the proposed note because it was redundant to the TS requirements.

The licensee proposed changes to the TS Bases that conform to the proposed changes to the TSs. The staff has no objections to the proposed changes to the TS Bases.

3.0 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.

4.0 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 (69 FR 40675). 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 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.

6.0 REFERENCES

1. Letter from T. Coutu, Nuclear Management Company, LLC, to U. S. Nuclear Regulatory Commission, "License Amendment Request 203 to the Kewaunee Nuclear Power Plant Technical Specifications, Rod Position Indication," dated May 25, 2004.
2. Letter from C. Lambert, Nuclear Management Company, LLC, to U. S. Nuclear Regulatory Commission, "Response to NRC Request for Additional Information RE: License Amendment Request 203 to the Kewaunee Nuclear Power Plant Technical Specifications, Rod Position Indication," dated February 2, 2005.
3. Letter from C. Lyon, USNRC, to Thomas Coutu, Kewaunee Nuclear Power Plant, "Issuance of Amendment RE: Rod Position Indication," dated September 22, 2004.
4. NUREG-0800, "Standard Review Plan (SRP) for the Review of Safety Analysis Reports for Nuclear Power Plants LWR Edition."
5. NUREG-1431, Standard Technical Specifications for Westinghouse Plants, June 2001.
6. Kewaunee Updated Safety Analysis Report, Chapter 7, Rev. 18.

Principal Contributor: M. Barillas

Date: March 24, 2005