

August 8, 2005

Mr. Mano K. Nazar  
Senior Vice President and  
Chief Nuclear Officer  
Indiana Michigan Power Company  
Nuclear Generation Group  
One Cook Place  
Bridgman, MI 49106

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2 - ISSUANCE OF  
AMENDMENTS RE: CONDITIONAL EXEMPTION FROM MEASUREMENT OF  
END-OF-LIFE MODERATOR TEMPERATURE COEFFICIENT  
(TAC NOS. MC6318 AND MC6319)

Dear Mr. Nazar:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 288 to Facility Operating License No. DPR-58 and Amendment No. 270 to Facility Operating License No. DPR-74 for the Donald C. Cook Nuclear Plant (CNP), Units 1 and 2. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated February 25, 2005, as supplemented June 2, 2005. The amendments revise both the Improved TSs (ITs) and the Current TSs (CTs).

The amendments modify the TSs by revising the near-end-of-life moderator temperature coefficient (MTC) surveillance requirement by placing a set of conditions on core performance, which, if met, would allow conditional exemption from the required MTC measurement.

ITs were approved on June 1, 2005, by Amendment Nos. 287 and 269 for CNP, Units 1 and 2, respectively. The ITs will become the governing TSs for CNP, Units 1 and 2, upon the date of implementation of the ITs for each unit, but no later than October 31, 2005. Until the implementation of the ITs is completed, the CTs shall remain in effect and the units will be operated in accordance with the requirements of the CTs.

M. Nazar

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A copy of our related safety evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next 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 Nos. 50-315 and 50-316

Enclosures: 1. Amendment No. 288 to DPR-58  
2. Amendment No. 270 to DPR-74  
3. Safety Evaluation

cc w/encls: See next page

M. Nazar

-2-

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Sincerely,

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Carl F. Lyon, Project Manager, Section 1  
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cc w/encls: See next page

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ADAMS ACCESSION NO.: ML052010575 (Letter)

\*SE dated 7/15/05

ADAMS ACCESSION NO.: ML052010581 (Package)

ADAMS ACCESSION NO.: ML052200366 (Technical Specifications)

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INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-315

DONALD C. COOK NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 288  
License No. DPR-58

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Indiana Michigan Power Company (the licensee) dated February 25, 2005, as supplemented June 2, 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-58 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 288, 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 its date of issuance and shall be implemented within 60 days.

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: August 8, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 288

TO FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

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.

Current TSs:

REMOVE

3/4 1-5a  
6-12

INSERT

3/4 1-5a  
6-12

Improved TSs:

REMOVE

3.1.3-2  
5.6-3  
5.6-4

INSERT

3.1.3-2  
5.6-3  
5.6-4

INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-316

DONALD C. COOK NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 270  
License No. DPR-74

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Indiana Michigan Power Company (the licensee) dated February 25, 2005, as supplemented June 2, 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-74 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 270, 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 its date of issuance and shall be implemented within 60 days.

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: August 8, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 270

FACILITY OPERATING LICENSE NO. DPR-74

DOCKET NO. 50-316

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.

Current TSs:

REMOVE

3/4 1-6  
6-12

INSERT

3/4 1-6  
6-12

Improved TSs:

REMOVE

3.1.3-2  
5.6-3  
5.6-4

INSERT

3.1.3-2  
5.6-3  
5.6-4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 288 TO FACILITY OPERATING LICENSE NO. DPR-58  
AND AMENDMENT NO. 270 TO FACILITY OPERATING LICENSE NO. DPR-74  
INDIANA MICHIGAN POWER COMPANY  
DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-315 AND 50-316

1.0 INTRODUCTION

By application dated February 25, 2005, as supplemented June 2, 2005, the Indiana Michigan Power Company (the licensee) requested amendments to the Technical Specifications (TSs) for the Donald C. Cook Nuclear Plant (CNP), Units 1 and 2. The proposed amendments would modify the TSs by revising the near-end-of-life moderator temperature coefficient (MTC) surveillance requirement (SR) by placing a set of conditions on core performance, which, if met, would allow conditional exemption from the required MTC measurement.

Improved TSs (ITSs) were approved on June 1, 2005, by Amendment Nos. 287 and 269 for CNP, Units 1 and 2, respectively. The ITSs will become the governing TSs for CNP, Units 1 and 2, upon the date of implementation of the ITSs for each unit, but no later than October 31, 2005. Until the implementation of the ITSs is completed, the current TSs (CTSs) shall remain in effect and the units will be operated in accordance with the requirements of the CTSs. The proposed amendments are for both the CTSs and the ITSs.

CTS SR 4.1.1.4.b and ITS SR 3.1.3.2 require the licensee to perform a MTC measurement near end-of-life (EOL), and compare the measured value to the TS SR value for the full-power, all rods out (i.e., withdrawn from the core) condition. The licensee must perform this measurement 7 effective full-power days after reaching an equilibrium boron concentration of 300 ppm, or an equivalent of an equilibrium rated thermal power, with all rods out and a boron concentration of 300 ppm. Each measurement requires several hours at less than full power operation, and presents a perturbation to normal operations. The proposed changes would revise the EOL MTC CTS SR 4.1.1.4.b and ITS SR 3.1.3.2 by placing a set of conditions on core performance which, if met, allow exemption from the required MTC measurement. The conditional exemption would minimize disruptions to normal plant operations.

The supplement dated June 2, 2005, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on March 29, 2005 (70 FR 15943).

## 2.0 EVALUATION

### 2.1 Regulatory Evaluation

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(c)(3), "Surveillance Requirements," stipulates that surveillance requirements related to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met, are to be included in the TSs.

The MTC is one of the controlling parameters for power and reactivity increases. The SRs ensure that the MTC remains within the bounds of the CNP Updated Final Safety Analysis Report. The SRs also ensure that accident analyses Limiting Conditions for Operation (LCOs) on the MTC will continue to be met. The LCOs ensure inherently stable power operations during normal operation and accident conditions.

The requested amendment entails a change to CTS SR 4.1.1.4.b and ITS SR 3.1.3.2, by placing a set of conditions on core performance, which if met, would allow conditional exemption from the required MTC measurement. The conditional exemption will be determined on a cycle-specific basis by considering the margin predicted to the SR MTC limit and the performance of other core parameters, such as beginning-of-life MTC measurements and the critical boron concentration as a function of cycle average burnup. The conditional exemption is based on the significant amount of information gained since 1980 for validating computational methodologies for predicting EOL MTC. In 1993, Westinghouse proposed in Topical Report WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," to eliminate the SR for the EOL MTC if a specified revised prediction of the MTC and limits for several core parameters measured during the cycle are within specified bounds. In a letter dated October 9, 1996, the NRC staff approved WCAP-13749-P-A for referencing in licensing applications to the extent of the specified limitations. The NRC staff has also approved similar submittals at plants implementing WCAP-13749-P-A, specifically, South Texas Project and Virgil C. Summer.

As discussed in Section 2.2 below, the NRC staff has determined that allowing the conditional exemption of the EOL MTC measurement for CNP, Units 1 and 2, will not compromise plant safety criteria, or change the MTC LCO and SR limits, and therefore, 10 CFR 50.36(c)(3) continues to be satisfied.

### 2.2 Technical Evaluation

The licensee proposes changes to (1) modify CTS SR 4.1.1.4.b and ITS SR 3.1.3.2, to allow for conditional exemption of the SR, and (2) add WCAP-13749-P-A to the list of references for the core operating limits report (COLR) in CTS 6.9.1.9.2, and ITS 5.6.5, respectively. For CTS SR 4.1.1.4, a footnote is added, which states that "Measurement of the MTC in accordance with SR 4.1.1.4.b may be suspended, provided that the benchmark criteria in WCAP-13749-P-A and the Revised Prediction specified in the COLR are satisfied." For ITS SR 3.1.3.2, a NOTE is added, which states that [SR 3.1.3.2] is not required to be performed provided that the benchmark criteria in WCAP-13749-P-A and the Revised Prediction specified in the COLR are satisfied.

The proposed exemption of the SR for the EOL MTC is conditional on the basis that the specified design code benchmark criteria for several core reactivity and power distribution parameters measured during the cycle are met and a specified revised prediction of the MTC is bounded by the SR MTC limit. The three main components which contribute to an MTC prediction different from the measured MTC of the core are the following: (1) the global core reactivity as indicated by the soluble boron letdown curve, (2) variations in the core average axial offset, and (3) the MTC predictive capability of the design model. WCAP-13749-P-A addresses these three components and specifies an algorithm that computes a revised predicted MTC based on the actual core reactivity and the axial power distribution. Benchmark analyses demonstrate that the core model, based on the PHOENIX/ANC design system, accurately predicts the depletion characteristics of the operating core and indicates whether sufficient margin exists to the SR limit for the operating conditions of the core. The validated computational algorithm forms the basis of the proposed conditional exemption from the hot full-power near-EOL 300 ppm MTC measurement at CNP. The safety analysis assumption of a constant moderator density coefficient and the actual value assumed will not change. The TS Bases for, and values of, the most negative MTC LCO and for the SRs are not altered. Rather, a revised prediction is compared to the surveillance MTC to determine if the limit is met. The method for calculating the revised predicted MTC is the approved methodology of WCAP-13749-P-A, and, therefore, is acceptable to the NRC staff. This acceptance is subject to the following limitations: (1) only PHOENIX/ANC calculation methods are used for the individual plant analyses relevant to determinations for the EOL MTC plant methodology, and (2) the predictive correction is reexamined if changes in core fuel designs or continued MTC calculation/measurement data show significant effect on the predictive correction.

WCAP-13749-P-A specifies for licensees to submit to the NRC each cycle a "Most Negative Moderator Temperature Coefficient Limit Report," which includes limitations, procedures, benchmark criteria, and the algorithm for determining the revised predicted surveillance MTC limit. The NRC staff held a conference call with the licensee to discuss the reporting requirement on April 28, 2005. The NRC staff concurs with the licensee that there is an inconsistency in WCAP-13749-P-A with regard to the time frame of data collection and the submittal of the report to the NRC. However, since the WCAP-13749-P-A is based on generic data, the NRC staff wishes to obtain plant specific data rather than completely eliminate the reporting requirement. By letter dated June 2, 2005, the licensee agreed to submit the MTC Limit Report for 3 cycles for both Units 1 and 2, no later than 60 days after the information is available. This is consistent with the staff's previous approval of the request for conditional exemption for South Texas Project (ML023400252), and is therefore acceptable.

The notes of CTS SR 4.1.1.4.b and ITS SR 3.1.3.2 allow for the exemption only if the revised prediction specified in the benchmark criteria in WCAP-13749-P-A and the revised prediction specified in the COLR are satisfied. The licensee proposes to revise its COLR, specifically adding Section 2.1.3, which describes the algorithm used to calculate the revised predicted MTC. Also, the predictive correction will be revised if changes in core fuel designs or continued MTC calculation/measurement data show significant effect on the predictive correction. That is an acceptable method as described in WCAP-13749-P-A. The addition of Section 2.1.3 in the COLR is acceptable and consistent with NRC Generic Letter 88-16, "Removal of Cycle-Specific Parameter Limits from Technical Specifications," which specifies that the COLR will document the specific values of certain cycle-specific parameter limits resulting from licensee's calculations, as long as the TS references the acceptable method (e.g., WCAP-13749-P-A).

Therefore, it is acceptable to include WCAP-13749-P-A in the COLR reference section of CTS 6.9.1.9.2 and ITS 5.6.5, respectively.

### 2.3 Technical Conclusion

The NRC staff has reviewed the licensee's proposed TS changes to: (1) revise CTS SR 4.1.1.4.b and ITS SR 3.1.3.2 to suspend the MTC measurement if the model benchmark criteria and Revised Prediction specified in the COLR are satisfied, and (2) add WCAP-13749-P-A to the list of references for the COLR in CTS 6.9.1.9.2 and ITS 5.6.5. The NRC staff finds that the proposed TS changes comply with the requirements of 10 CFR 50.36(c)(3), and therefore, are acceptable.

Furthermore, the NRC staff finds it acceptable to eliminate the reporting requirement associated with the MTC Limit Report given the licensee's commitment in its letter dated June 2, 2005, to provide the pertinent MTC information to the NRC no later than 60 days after the performance of the conditional EOL MTC elimination determination for the next three fuel cycles of the WCAP-13749-P-A methodology for both Unit 1 and Unit 2.

### 3.0 STATE CONSULTATION

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

### 4.0 ENVIRONMENTAL CONSIDERATION

These amendments change the requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or change the surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents 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 the amendments involve no significant hazards consideration and there has been no public comment on such finding (70 FR 15943). Accordingly, the amendments meet 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 the amendments.

### 5.0 CONCLUSION

The NRC 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 the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: A. Attard

Date: August 8, 2005