

February 10, 2006

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 TO DELETE THE POWER RANGE NEUTRON FLUX HIGH  
NEGATIVE RATE TRIP FUNCTION (TAC NOS. MC8805 AND MC8806)

Dear Mr. Nazar:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 293 to Renewed Facility Operating License No. DPR-58, and Amendment No. 275 to Renewed Facility Operating License No. DPR-74 for Donald C. Cook Nuclear Plant, Units 1 and 2. The amendments change the Technical Specifications in response to your application dated August 10, 2005.

The amendments deleted the power range neutron flux high negative rate trip function from Table 3.3.1-1, "Reactor Trip System Instrumentation."

A copy of the associated safety evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

**/RA/**

Peter S. Tam, Senior Project Manager  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-315 and 50-316

Enclosures: 1. Amendment No. 293 to DPR-58  
2. Amendment No. 275 to DPR-74  
3. Safety Evaluation

cc w/encls: See next page

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Package Accession Number: **ML060410600**  
Amendment Accession Number: **ML060230452**  
Tech Spec Accession Number: **ML060440022**

OFFICE	NRR/LPL3-1/PM	NRR/LPL3-1/LA	NRR/SPWB/BC	OGC	NRR/LPL3-1/BC(A)
NAME	PTam	THarris	JNakoski*	MSpencer	TKobetz
DATE	1/27/06	1/26/06	1/11/06*	2/6/06	2/10/06

\*Safety evaluation of 1/11/06 used substantially unaltered.

INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-315

DONALD C. COOK NUCLEAR PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 293  
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 August 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 Renewed Facility Operating License No. DPR-58 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and Appendix B, as revised through Amendment No. 293, are hereby incorporated in the renewed operating 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 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

**/RA/**

Timothy J. Kobetz, Acting Chief  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: February 10, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 293

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

Replace the following page of Appendix A, "Technical Specifications," with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE

3.3.1-11

INSERT

3.3.1-11

INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-316

DONALD C. COOK NUCLEAR PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 275  
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 August 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 Renewed Facility Operating License No. DPR-74 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and Appendix B, as revised through Amendment No. 275, are hereby incorporated in the renewed operating 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 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

**/RA/**

Timothy J. Kobetz, Acting Chief  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: February 10, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 275

RENEWED FACILITY OPERATING LICENSE NO. DPR-74

DOCKET NO. 50-316

Replace the following page of Appendix A, "Technical Specifications," with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE

3.3.1-11

INSERT

3.3.1-11

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 293 TO  
RENEWED FACILITY OPERATING LICENSE NO. DPR-58  
AND AMENDMENT NO. 275 TO RENEWED 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 August 10, 2005 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML052300238), Indiana Michigan Power Company (the licensee) requested amendments to the Technical Specifications (TSs) for the Donald C. Cook (D. C. Cook) Nuclear Plant, Units 1 and 2. The proposed amendments would delete the power range neutron flux high negative rate trip function from Table 3.3.1-1, "Reactor Trip System Instrumentation."

The licensee stated that the proposed change would allow elimination of an unnecessary trip function and thereby reduce the potential for a transient due to reactor shutdown in meeting TS requirements for a limiting condition for operation (LCO) of the trip function. The Nuclear Regulatory Commission (NRC) staff's review of the application is set forth below.

2.0 REGULATORY EVALUATION

The following regulatory requirements are applicable to the proposed TS changes discussed in the license amendment application.

General design criterion (GDC) 10, "Reactor Design," in Appendix A to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, requires that the reactor core and associated coolant, control and protection system be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

Also, the NRC's regulatory requirements related to the content of TSs are set forth in 10 CFR 50.36, "Technical Specifications." Specifically, 10 CFR 50.36(c)(2)(ii) specifies four screening criteria to be used in determining whether an LCO is required to be included in the TSs:

Criterion 1 - Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary (RCPB);

Criterion 2 - A process variable, design feature, or operating restriction that is an initial condition of a design-basis accident (DBA) or transient analysis that either assumes the failure of, or presents a challenge to, the integrity of a fission product barrier;

Criterion 3 - A structure, system or component (SSC) that is part of the primary success path, and which functions or actuates to mitigate a DBA or transient that either assumes the failure of, or presents a challenge to, the integrity of a fission product barrier; and

Criterion 4 - An SSC which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

The licensee proposed to delete the power range neutron flux high negative rate trip function from the D. C. Cook TSs. The NRC staff evaluation of the licensee's proposed change was predicated upon continued compliance with the GDC 10 requirements and the screening criteria specified in 10 CFR 50.36.

### 3.0 TECHNICAL EVALUATION

The power range neutron flux high negative rate trip function was designed as part of the reactor protection system (RPS) to mitigate the consequences of one or more dropped rod cluster control assemblies (RCCAs) event. The dropped RCCAs event is an anticipated operational occurrence, and is caused by a single electric or mechanical failure that results in a number and combination of RCCAs from the same group of a given bank to drop to the bottom of the core. The resulting negative reactivity insertion causes nuclear power to quickly decrease and core radial peaking factors to increase. The reduced power and continued steam generation cause the reactor coolant temperature to decrease. In the manual control mode, the positive reactivity feedback due to dropping temperature causes the reactor power to rise to initial power level at a reduced reactor vessel inlet temperature with no power overshoot. In the automatic control mode, the plant control system detects the reduction in core power and initiates control bank withdrawal in order to restore core power. As a result, power overshoot occurs, resulting in lower calculated departure from nucleate boiling ratios (DNBRs). At higher power levels, in the event of a dropped RCCA event, the RPS will detect the rapidly decreasing neutron flux due to the dropped RCCAs and trip the reactor based on the power range neutron flux high negative rate trip function, thus ending the transient and assuring that DNBR design limits are maintained. Since the dropped RCCA event is an anticipated operational occurrence, it must be shown that to satisfy GDC 10 requirements, the DNBR design limits are met for the combination of high nuclear power, high radial peaking factor, and other system conditions that exist following the dropped RCCA event.

In a topical report WCAP-10297-P-A, "Dropped Rod Methodology for Negative Flux Rate Trip Plants" (see ADAMS Accession No. 8304140120) Westinghouse documented a methodology for the analysis of the dropped RCCA event and concluded that the high negative flux rate trip was required only when a dropped RCCA (or RCCA bank) exceeded the threshold value of reactivity worth. Any dropped RCCA having a worth below the threshold value would not

require an automatic reactor trip to satisfy the DNBR limit. The "A" in the reference number of the topical report indicates that it had been previously approved by the NRC staff.

By letter dated April 25, 1990, the Westinghouse Owners Group submitted an updated topical report WCAP-11394-P-A, "Methodology for the Analysis of the Dropped Rod Event" (see ADAMS Accession No. 9005090249). This methodology provides a means to be used to demonstrate that DNBR limits are met during a dropped RCCA event. The analysis using this methodology takes no credit for any direct trip due to the dropped RCCAs, and assumes that no automatic power reduction features are actuated by the dropped RCCAs. The conclusion reached in WCAP-11394-P-A was that sufficient margin is available in all Westinghouse core designs and fuel types, such that the high negative flux rate trip is not required, regardless of the worth of the dropped RCCA (or bank), subject to a plant cycle-specific analysis. The NRC had previously reviewed the Westinghouse analysis and result (as is indicated by the "A" in the reference number), and concluded that the approach in WCAP-11394-P-A was acceptable for analyzing the dropped RCCAs event for which no credit is taken for any direct trip or automatic power reduction features. In the approval, the NRC noted that further review by the NRC staff for each cycle is not necessary, subject to a licensee verification that the analysis described in WCAP-11394-P-A has been performed, and the comparison specified in the topical report has been made and favorable results were obtained.

In support of the proposed amendment, the licensee reviewed the D. C. Cook safety analyses of record and confirmed that:

- (1) The power range neutron flux high negative rate trip is not credited in the loss-of-coolant accident (LOCA) and LOCA-related analyses, the containment integrity analysis, the main steamline break mass and energy release analysis, steam generator tube rupture analysis, and control system analysis. The non-LOCA analyses do not take credit for the power range neutron flux high negative rate trip function. The analysis of record for the dropped RCCA event was performed using the methods in WCAP-11394-P-A.
- (2) The power range neutron flux high negative rate trip has no impact on the safety system setpoints, the emergency operating procedures, and the reactor coolant system component integrity.

Based on its review of the licensee's evaluation discussed above, the NRC staff agrees with the licensee that the proposed deletion of the power range neutron flux high negative rate trip function does not affect the analyses for design basis events, nor have an impact on safety system setpoints, procedures, or reactor coolant system component integrity.

In addition, the NRC staff finds that the deletion of the power range neutron flux high negative rate trip function from the TSs satisfies the four screening criteria specified in 10 CFR 50.36(c)(2)(ii) for TS LCO, since the subject trip function is:

- (a) Not an installed instrumentation used to detect and indicate a significant abnormal degradation of the RCPB (Criterion 1);
- (b) Not a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient analysis (Criterion 2);

- (c) Not an SSC that is part of the primary success path and which functions or actuates to mitigate a DBA or transient (Criterion 3);
- (d) Not an SSC which operating experience or probabilistic risk assessment has shown to be significant to public health and safety (Criterion 4).

Therefore, the NRC staff finds it acceptable to delete the power range neutron flux high negative rate trip function from Table 3.3.1-1.

#### 4.0 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.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes the requirements 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 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 amendment involves no significant hazards consideration and there has been no public comment on such finding (70 FR 72674). Accordingly, the 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 the 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 the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: S. Sun

Date: February 10, 2006

Donald C. Cook Nuclear Plant, Units 1 and 2

cc:

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