March 15, 1995

Mr. E. E. Fitzpatrick, Vice President
Indiana Michigan Power Company
c/o American Electric Power Service Corporation
1 Riverside Plaza
Columbus, OH 43215

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT NOS. 1 AND 2 - ISSUANCE OF AMENDMENTS RE: ROD MISALIGNMENT REQUIREMENT FOR MOVABLE CONTROL ASSEMBLIES (TAC NOS. M88765 AND M88766)

Dear Mr. Fitzpatrick:

The Commission has issued the enclosed Amendment No. 193 to Facility Operating License No. DPR-58 and Amendment No. 179 to Facility Operating License No. DPR-74 for the Donald C. Cook Nuclear Plant, Unit Nos. 1 and 2. The amendments consist of changes to the Technical Specifications (TS) in response to your application dated January 17, 1994 and supplemented February 10, 1995.

The amendments revise TS Section 3/4.1.3 to increase the limit for control rod misalignment at or below 85% rated thermal power. The amendments also increase the limit for control rod misalignment above 85% rated thermal power if there is sufficient margin in the heat flux and the nuclear enthalpy hot channel factors.

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

Sincerely,

Original signed by

John B. Hickman, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-315 and 50-316

Enclosures: 1. Amendment No. 193 to DPR-58
2. Amendment No. 179 to DPR-74
3. Safety Evaluation

cc w/encl: See next page

DOCUMENT NAME: G:\WPDOCS\DCCOOK\C088765.AMD

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DATE	2/22/95		2/23/95		2/27/95		3/2/95		3/13/95

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cc:

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DATED: March 15, 1995

AMENDMENT NO. 193 TO FACILITY OPERATING LICENSE NO. DPR-58-D. C. COOK-UNIT 1
AMENDMENT NO. 179 TO FACILITY OPERATING LICENSE NO. DPR-74-D. C. COOK-UNIT 2

Docket File
PUBLIC
PDIII-1 Reading
J. Roe
J. Hannon
C. Jamerson
J. Hickman (2)
OGC
G. Hill (4)
C. Grimes, O-11F23
A. Attard
ACRS (4)
OPA
OC/LFDCB
W. Kropp, RIII
SEDB

cc: Plant Service list

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

INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-315

DONALD C. COOK NUCLEAR PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 193
License No. DPR-58

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

   A. The application for amendment by Indiana Michigan Power Company (the licensee) dated January 17, 1994 and supplemented February 10, 1995, 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:

   Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 193 , 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 the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Cynthia A Carpenter for

John N. Hannon, Director
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 15, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 193

TO FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

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

REMOVE	INSERT
3/4 1-18	3/4 1-18
3/4 1-19	3/4 1-19
-	3/4 1-19b
3/4 1-20	3/4 1-20
B 3/4 2-4	B 3/4 2-4

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full length (shutdown and control) rods shall be OPERABLE with all individual indicated rod positions within the allowed rod misalignment of their group step counter demand position as follows:

- for THERMAL POWER less than or equal to 85% of RATED THERMAL POWER, the allowed rod misalignment is ±18 steps, and
- for THERMAL POWER greater than 85% of RATED THERMAL POWER, the allowed rod misalignment is ±12 steps or as determined from Figure 3.1-4. Figure 3.1-4 permits an allowed rod misalignment from ±13 steps (for APL equal to 101%) to ±18 steps (for APL greater or equal to 106%) provided the value of R (defined in Figure 3.1-4) is greater than or equal to 1.04.

APPLICABILITY: MODES 1* and 2*

ACTION:

a. With one or more full length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.

b. With more than one full length rod inoperable or misaligned from the group step counter demand position by more than the allowed rod misalignment, be in HOT STANDBY within 6 hours.

c. With one full length rod inoperable due to causes other than addressed by ACTION a, above, or misaligned from its group step counter demand position by more than the allowed rod misalignment, POWER OPERATION may continue provided that within one hour either:

   1. The affected rod is restored to OPERABLE status within the above alignment requirements, or THERMAL POWER level is reduced to less than or equal to 85% of RATED THERMAL POWER for rod misalignments less than or equal to ±18 steps, or

   2. The affected rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:

      a) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions, and

*See Special Test Exceptions 3.10.2 and 3.10.4

LIMITING CONDITION FOR OPERATION (Continued)

b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours, and

c) A power distribution map is obtained from the movable incore detectors and $F_Q(Z)$ and $F^N_{\Delta H}$ are verified to be within their limits within 72 hours, and

d) Either the THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within one hour and within the next 4 hours the high neutron flux trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER, or

e) The remainder of the rods in the group with the inoperable rod are aligned to within the allowed rod misalignment of the inoperable rod within one hour while maintaining the rod sequence and insertion limits as specified in the COLR; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.5 during subsequent operation.

SURVEILLANCE REQUIREMENTS

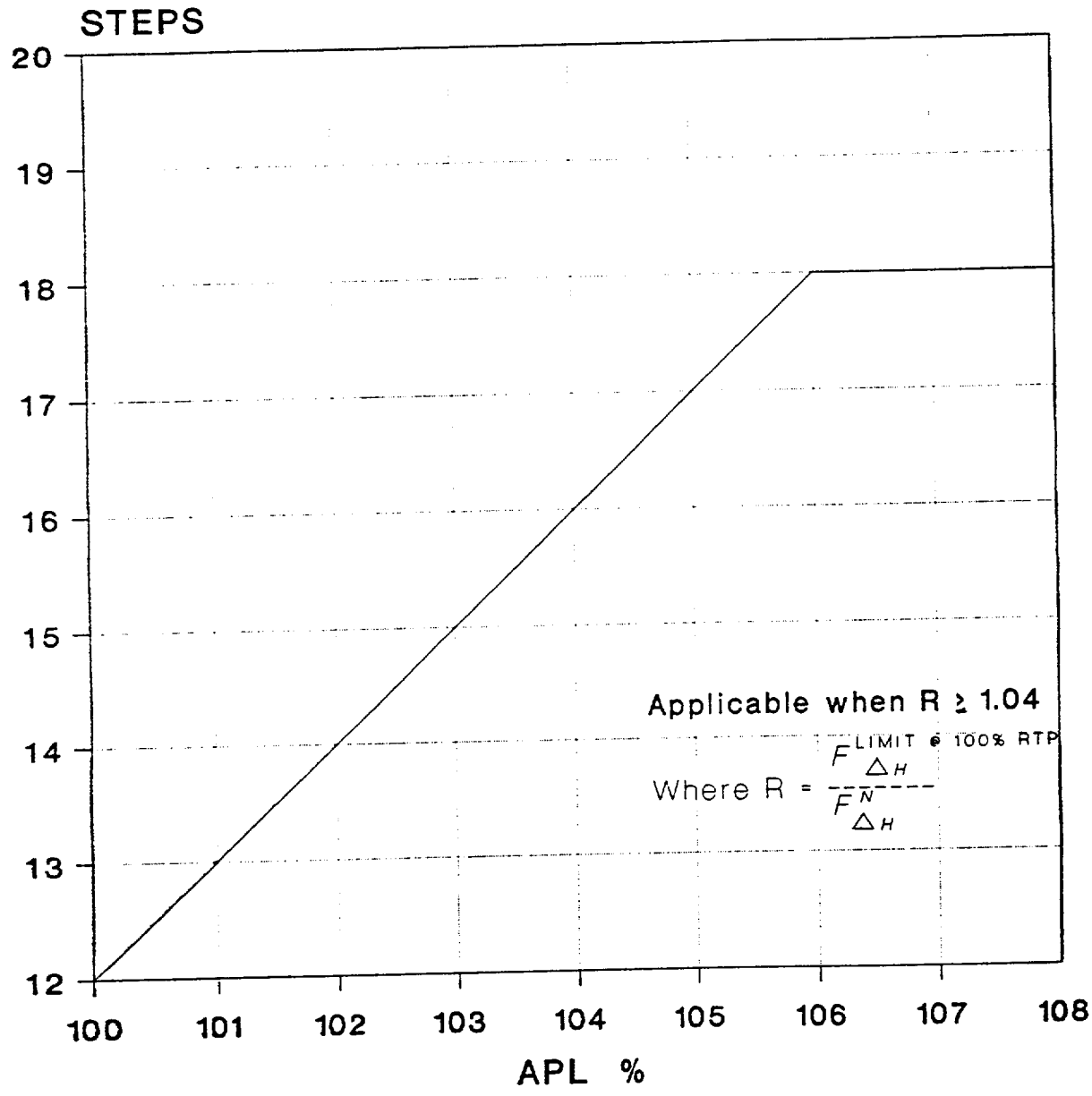
4.1.3.1.1 The position of each full length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full length rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 8 steps in any one direction at least once per 92 days.

4.1.3.1.3 The allowed rod misalignment for THERMAL POWER greater than 85% of RATED THERMAL POWER shall be determined in conjunction with the measurement of APL as defined in Specification 4.2.6.2.

ALLOWED ROD MISALIGNMENT ABOVE 85% RTP

FIGURE 3.1-4



REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

3.1.3.2 All shutdown and control rod position indicator channels and the demand position indication system shall be OPERABLE and capable of determining the control rod positions within the allowed rod misalignment specified in Specification 3.1.3.1.

APPLICABILITY: MODES 1 and 2.

ACTION:

a. With a maximum of one rod position indicator channel per group inoperable either:

   1. Determine the position of the non-indicating rod(s) indirectly by the movable incore detectors at least once per 8 hours and immediately after any motion of the non-indicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or

   2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

b. With a maximum of one demand position indicator per bank inoperable either:

   1. Verify that all rod position indicators for the affected bank are OPERABLE and that the most withdrawn rod and the least withdrawn rod of the bank are within a maximum of the allowed rod misalignment of each other, at least once per 8 hours, or

   2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.2 Each rod position indicator channel shall be determined to be OPERABLE by verifying the demand position indication system and the rod position indicator channels agree within the allowed rod misalignment at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then compare the demand position indication system and the rod position indicator channels at least once per 4 hours.

BASES

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR, AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor, and nuclear enthalpy rise hot channel factors ensure that 1) the design limits on peak local power density and minimum DNBR are not exceeded and 2) in the event of a LOCA the peak fuel clad temperature will not exceed the 2200°F ECCS acceptance criteria limit.

Each of these is measurable, but will normally only be determined periodically, as specified in Specifications 4.2.2.1, 4.2.2.2, 4.2.3, 4.2.6.1 and 4.2.6.2. This periodic surveillance is sufficient to ensure that the hot channel factor limits are maintained provided:

a. Control rods in a single group move together with no individual rod insertion differing by more than ± 18 steps from the group demand position (allowed rod misalignment) for power levels less than or equal to 85% of RATED THERMAL POWER. For power levels greater than 85% of RATED THERMAL POWER, the allowed rod misalignment is from ±12 to ±18 steps, which is dependent on the Allowable Power Level and the ratio of $F^N_{\Delta H}$ limit at 100% of RATED THERMAL POWER to maximum measured $F^N_{\Delta H}$ as indicated in Figure 3.1-4.

b. Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.5.

c. The control rod insertion limits of Specifications 3.1.3.4 and 3.1.3.5 are maintained.

d. The axial power distribution, expressed in terms of AXIAL FLUX DIFFERENCE, is maintained within the limits.

The relaxation in $F^N_{\Delta H}$ as a function of THERMAL POWER allows changes in the radial power shape for all permissible rod insertion limits. $F^N_{\Delta H}$ will be maintained within its limits as specified in the COLR, provided conditions (a) through (d) above are maintained.

When an F_Q measurement is taken, both experimental error and manufacturing tolerance must be allowed for. 5% is the appropriate allowance for a full core map taken with the incore detector flux mapping system, and 3% is the appropriate allowance for manufacturing tolerance.

When $F^N_{\Delta H}$ is measured, experimental error must be allowed for, and 4% is the appropriate allowance for a full core map taken with the incore detection system. This 4% measurement uncertainty has been included in the design DNBR limit value. The specified limit for $F^N_{\Delta H}$ also contains an additional 4% allowance for uncertainties. The total allowance is based on the following considerations:

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

INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-316

DONALD C. COOK NUCLEAR PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 179
License No. DPR-74

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

   A. The application for amendment by Indiana Michigan Power Company (the licensee) dated January 17, 1994 and supplemented February 10, 1995, 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:

   Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 179 , 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 the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Cynthia A Carpenter

John N. Hannon, Director
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 15, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 179

FACILITY OPERATING LICENSE NO. DPR-74

DOCKET NO. 50-316

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

REMOVE	INSERT
3/4 1-18	3/4 1-18
3/4 1-19	3/4 1-19
-	3/4 1-20a
3/4 1-21	3/4 1-21
B 3/4 2-4	B 3/4 2-4

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full length (shutdown and control) rods shall be OPERABLE with all individual indicated rod positions within the allowed rod misalignment of their group step counter demand position as follows:

- for THERMAL POWER less than or equal to 85% of RATED THERMAL POWER, the allowed rod misalignment is ±18 steps, and
- for THERMAL POWER greater than 85% of RATED THERMAL POWER, the allowed rod misalignment is ±12 steps or as determined from Figure 3.1-4. Figure 3.1-4 permits an allowed rod misalignment from ±13 steps (for APL equal to 101%) to ±18 steps (for APL greater or equal to 106%) provided the value of R (defined in Figure 3.1-4) is greater than or equal to 1.04.

APPLICABILITY: MODES 1* and 2*

ACTION:

a. With one or more full length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.

b. With more than one full length rod inoperable or misaligned from the group step counter demand position by more than the allowed rod misalignment, be in HOT STANDBY within 6 hours.

c. With one full length rod inoperable due to causes other than addressed by ACTION a, above, or misaligned from its group step counter demand position by more than the allowed rod misalignment, POWER OPERATION may continue provided that within one hour either:

   1. The affected rod is restored to OPERABLE status within the above alignment requirements, or THERMAL POWER level is reduced to less than or equal to 85% of RATED THERMAL POWER for rod misalignments less than or equal to ±18 steps, or

   2. The affected rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:

      a) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions, and

*See Special Test Exceptions 3.10.2 and 3.10.3

LIMITING CONDITION FOR OPERATION (Continued)

b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours, and

c) A power distribution map is obtained from the movable incore detectors and $F_Q(Z)$ and $F^N_{\Delta H}$ are verified to be within their limits within 72 hours, and

d) Either the THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within one hour and within the next 4 hours the high neutron flux trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER, or

e) The remainder of the rods in the group with the inoperable rod are aligned to within the allowed rod misalignment of the inoperable rod within one hour while maintaining the rod sequence and insertion limits as specified in the COLR; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation.

SURVEILLANCE REQUIREMENTS

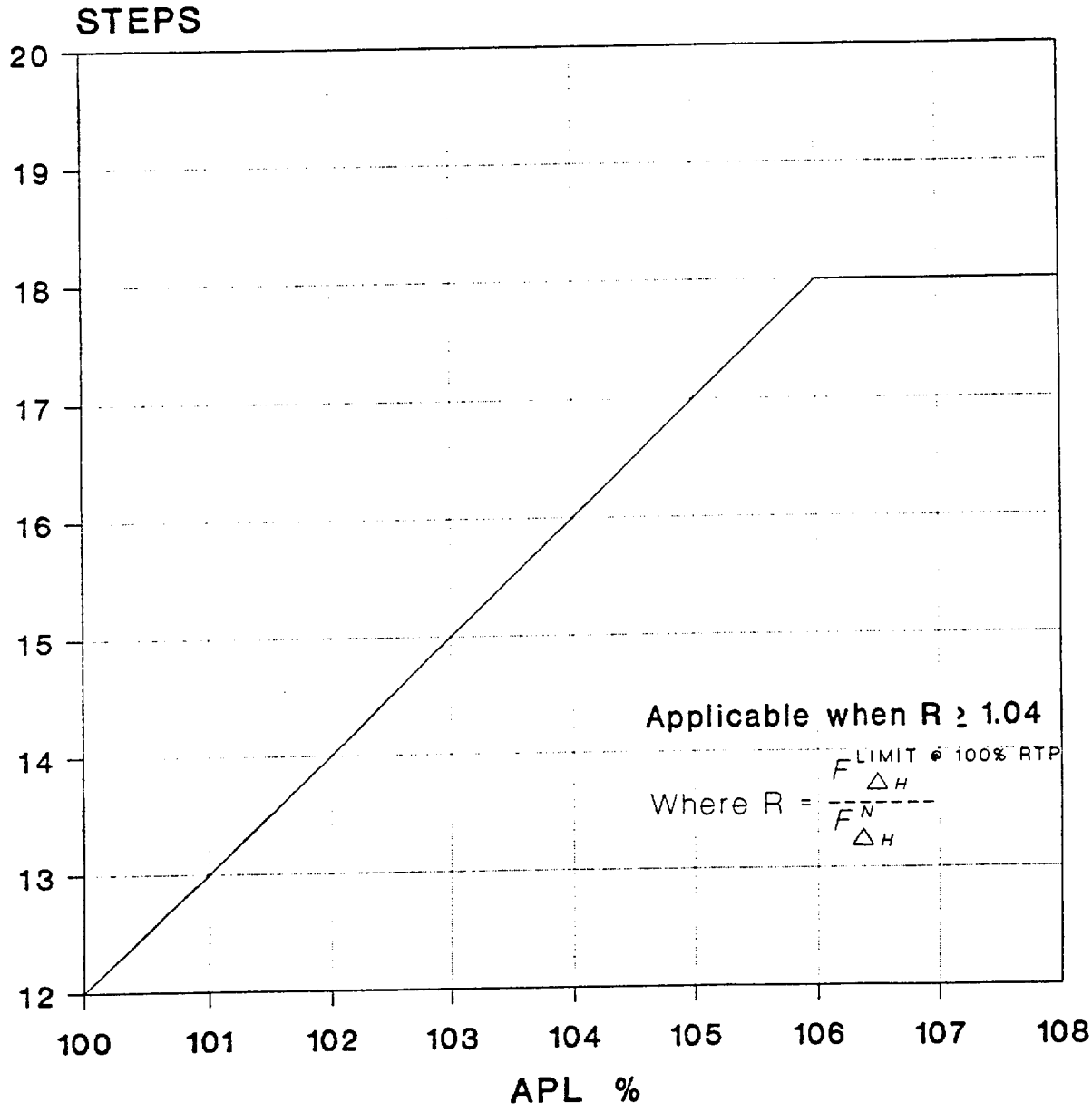
4.1.3.1.1 The position of each full length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full length rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 8 steps in any one direction at least once per 92 days.

4.1.3.1.3 The allowed rod misalignment for THERMAL POWER greater than 85% of RATED THERMAL POWER shall be determined in conjunction with the measurement of APL as defined in Specification 4.2.6.2.

ALLOWED ROD MISALIGNMENT ABOVE 85% RTP

FIGURE 3.1-4



REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS-OPERATING

LIMITING CONDITION FOR OPERATION

3.1.3.2 All shutdown and control rod position indicator channels and the demand position indication system shall be OPERABLE and capable of determining the control rod positions within the allowed rod misalignment specified in Specification 3.1.3.1.

APPLICABILITY: MODES 1 and 2.

ACTION:

a. With a maximum of one rod position indicator channel per group inoperable either:

   1. Determine the position of the non-indicating rod(s) indirectly by the movable incore detectors at least once per 8 hours and immediately after any motion of the non-indicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or

   2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

b. With a maximum of one demand position indicator per bank inoperable either:

   1. Verify that all rod position indicators for the affected bank are OPERABLE and that the most withdrawn rod and the least withdrawn rod of the bank are within a maximum of the allowed rod misalignment of each other, at least once per 8 hours, or

   2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.2 Each rod position indicator channel shall be determined to be OPERABLE by verifying the demand position indication system and the rod position indicator channels agree within the allowed rod misalignment at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then compare the demand position indication system and the rod position indicator channels at least once per 4 hours.

BASES

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR, AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor, and nuclear enthalpy rise hot channel factor ensure that 1) the design limits on peak local power density and minimum DNBR are not exceeded and 2) in the event of a LOCA the peak fuel clad temperature will not exceed the 2200°F ECCS acceptance criteria limit.

Each of these is measurable but will normally only be determined periodically as specified in Specifications 4.2.2.1, 4.2.2.2, 4.2.3, 4.2.6.1 and 4.2.6.2. This periodic surveillance is sufficient to ensure that the limits are maintained provided:

a. Control rods in a single group move together with no individual rod insertion differing by more than ±18 steps from the group demand position (allowed rod misalignment) for power levels less than or equal to 85% of RATED THERMAL POWER. For power levels greater than 85% of RATED THERMAL POWER, the allowed rod misalignment is from ±12 to ±18 steps, which is dependent on the Allowable Power Level and the ratio of $F^N_{\Delta H}$ limit at 100% of RATED THERMAL POWER to maximum measuered $F^N_{\Delta H}$ as indicated in Figure 3.1-4.

b. Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.6.

c. The control rod insertion limits of Specifications 3.1.3.5 and 3.1.3.6 are maintained.

d. The axial power distribution, expressed in terms of AXIAL FLUX DIFFERENCE, is maintained within the limits.

$F^N_{\Delta H}$ will be maintained within its limits as specified in the COLR provided conditions a. through d. above are maintained. The relaxation of $F^N_{\Delta H}$ as a function of THERMAL POWER allows changes in the radial power shape for all permissible rod insertion limits. The form of this relaxation for DNBR limits is discussed in Section 2.1.1 of this basis.

When an F_Q measurement is taken, both experimental error and manufacturing tolerance must be allowed for. 5% is the appropriate allowance on F_Q for a full core map taken with the incore detector flux mapping system and 3% is the appropriate allowance for manufacturing tolerance.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 193 TO FACILITY OPERATING LICENSE NO. DPR-58

AND AMENDMENT NO. 179 TO FACILITY OPERATING LICENSE NO. DPR-74

INDIANA MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT, UNIT NOS. 1 AND 2

DOCKET NOS. 50-315 AND 50-316

1.0 INTRODUCTION

By letters dated January 17, 1994 (Ref. 1) and February 10, 1995 (Ref. 3), the Indiana Michigan Power Company (the licensee) requested amendments to the Technical Specifications (TS) appended to Facility Operating License Nos. DPR-58 and DPR-74 for the Donald C. Cook Nuclear Plant, Unit Nos. 1 and 2. The proposed amendments would increase the TS limit for control rod misalignment below, at, and above 85% rated thermal power. The February 10, 1995 submittal clarified a potential inconsistency between ACTION statement 3.1.3.1.c.2.d, which requires a power reduction to 75%, and the possibility that the proposed amendment may allow a greater misalignment below 85% power than that allowed above 85% power.

The licensee indicated in its submittal that experience at D. C. Cook with the Analog Rod Position Indication (ARPI) System has shown that indicated rod misalignment could be greater than 12 steps. When this occurs, as per TS action item 3.1.3.2, an incore flux map must be taken every 8 hours. The licensee pointed out that at D. C. Cook, to ensure compliance with the action statement, flux maps are taken every 6 hours to verify the actual location of the rod. In all cases the flux maps have shown that there was no actual rod misalignment. In addition, the licensee stated that misaligned rods can be detected during normal operation (via changes in power, quadrant tilt or flux) and are realigned using established procedures. It is the licensee's contention that this excessive use of flux mapping will lead to increased maintenance and possibly an ALARA [as low as is reasonably achievable] concern. Consequently, changing the TS to allow 18 steps misalignment will reduce the usage of the flux mapping system.

2.0 EVALUATION

2.1 Analysis Method

The licensee performed neutronics analyses to evaluate the impact of rod cluster control assembly (RCCA) misalignment on steady-state power distributions and normal operational transients, such as load-follow

operations. The principal tool used in these calculations is the Westinghouse Advanced Nodal Computer Code (ANC) (Ref. 2). All the analyses utilizing ANC were performed in a three-dimensional mode, while full-core and quarter-core models were used for the analyses. All calculations were performed by Westinghouse using approved methodologies.

Discrete pin power and pin burnup information was obtained from ANC calculations. The licensee provided tabulated data regarding F_Q^{pin} and $F_{\Delta H}^{pin}$, where it was pointed out that it is the changes in F_Q values that are of major concern rather than absolute values of F_Q.

The licensee used the Unit 2 cycle 9 ANC model for the rod position indicator analysis, since the Unit 2 core has axial blankets and therefore larger peaking factors can be expected.

To verify the ANC code, the licensee used the Unit 2 cycle 9 ANC model to deplete the core and compare the results of the power distribution and boron letdown calculations with those of measured values.

2.2 Misalignment Calculations

2.2.1 85% Rated Thermal Power (RTP)

To determine power levels at which peaking factors increase due to RCCA misalignment, the licensee assumed misalignment of 30 steps (18 step indicated + 12 step uncertainty) for calculations from the power dependent insertion limit (PDIL). The licensee analyzed misalignment of groups of RCCAs in the control bank (groups 1 and 2 in control bank D) since it is more probable that the RCCAs in one group would misstep rather than different RCCAs from different groups would misstep. However, single RCCA misalignment calculations analysis was also performed. In particular, the misalignment of H-8 was investigated since this RCCA is in the middle of the core and is physically very difficult to monitor with an excore detector.

Analysis conducted by the licensee showed that peaking factors do not change substantially with power change as long as the reactor operation is on Constant Axial Offset Control. Data provided by the licensee for power at or below 85% power showed that at BOL [beginning of life] for single rod misalignment and for group misalignment, the maximum increase in F_Q is 4.7% and the maximum increase in $F_{\Delta H}$ is 2.8%. For the same power range, but at MOL [middle of life], similar calculations gave a maximum increase of 6.6% F_Q and a 0.7% increase in $F_{\Delta H}$. EOL [end of life] calculations showed an increase of 7.4% and 0.9% in F_Q and $F_{\Delta H}$, respectively.

The licensee carried out other sensitivity studies for similar RCCA misalignments from different D-bank positions and other than PDIL. These analyses showed an increase of 7.3% in F_Q and an increase of 2.7% in $F_{\Delta H}$.

Full core analysis of increases in the peaking factors were conducted. The rods H-12 and D-12 were misaligned 30 steps from ARO [all rods out] and PDIL resulting in an increase of 1.7% in F_Q and an increase of 0.9% in $F_{\Delta H}$. These increases in the peaking factors are well within the 15% at 85% RTP; consequently, an 18-step misalignment up to 85% RTP can be tolerated.

2.2.2 100% RTP

The licensee also performed sensitivity misalignment studies of control bank D at 100% RTP. Data for 24 steps (12 step indicated + 12 step uncertainty), 27 steps (15 step indicated + 12 step uncertainty), and 30 steps (18 step indicated + 12 step uncertainty), misalignment shows a maximum increase in F_Q of 8.9% and a maximum increase in $F_{\Delta H}$ of 4.1% at EOL. A similar misalignment case was performed from a D-bank position of 215 steps rather than from PDIL. The result was a very minor change in the peaking factors, similar to those changes observed due to misalignment for PDIL.

The result of the analysis indicated that the increase in F_Q due to an additional misalignment of three steps over the existing 12 step (indicated) misalignment was found to be 0.9%. The increase in F_Q due to an additional six steps (indicated) misalignment was found to be 1.6%. Finally, load-follow calculations showed an increase in F_Q of 3.4%. To be more conservative, and since the analysis was performed for a typical cycle, the licensee has chosen to increase the margin on F_Q to 6%. The implication is that provided that a 6% margin in F_Q exists, then an additional misalignment of six steps (that is a total of 18 steps indicated) is allowed at 100% RTP. Similar analysis for $F_{\Delta H}$ showed an increase of 0.8%. Review of the analyses conducted by the licensee indicates that if the requirements given in the TS 3.1.3.1 are satisfied, TS limits on F_Q and $F_{\Delta H}$ will not be violated even with an 18 step indicated misalignment. Consequently, the staff concurs with the licensee, that if TS 3.1.3.1 limiting conditions for operation are not violated, the initial conditions assumed in the accident analyses for Cook 1 and 2 are not violated, and the proposed change from 12 to 18 step (indicated) is therefore acceptable.

2.3 Summary

The NRC staff has reviewed the reports submitted by the licensee for the operation of Cook Units 1 and 2 and finds the proposed changes to TS 3/4.1.3 to be acceptable.

2.4 Administrative Change

The staff noted that the words "in the core" were added to Unit 1 TS 4.1.3.1.2 after the words "Each full length rod not fully inserted". This change is consistent with the wording for Unit 2, more accurately reflects the intent of the specification and is therefore acceptable.

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

The amendments change the requirements with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The 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 (59 FR 10008). 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 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.

6.0 REFERENCES

1. E.E. Fitzpatrick, Indiana Michigan Power Company, letter to U.S. Nuclear Regulatory Commission, Document control desk, Washington, DC, 20555, January 17, 1994.

2. Westinghouse Electric Company, "ANC--A Westinghouse Advanced Nodal Computer Code", WCAP-10965-P-A, December 1985. [Proprietary information. Not publicly available.]

3. E.E. Fitzpatrick, Indiana Michigan Power Company, letter to U.S. Nuclear Regulatory Commission, Document control desk, Washington, DC, 20555, February 10, 1995.

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