

April 22, 1992

Mr. E. E. Fitzpatrick, Vice President
 Indiana Michigan Power Company
 c/o American Electric Power Service Corporation
 1 Riverside Plaza
 Columbus, Ohio 43216

Dear Mr. Fitzpatrick:

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT 2 - AMENDMENT NO. 148 TO FACILITY OPERATING LICENSE NO. DPR-74 (TAC NO. M79838)

The Commission has issued the enclosed Amendment No. 148 to Facility Operating License No. DPR-74 for the Donald C. Cook Nuclear Plant, Unit No. 2. The amendment changes the Appendix A, Technical Specifications (TS) and associated Bases relating to boric acid storage tank and refueling water storage tank requirements. This action is in response to your application for a license amendment dated February 15, 1991 (AEP:NRC:1139) and supplemented December 13, 1991.

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

Sincerely,

Original signed by

John F. Stang, Project Manager
 Project Directorate III-1
 Division of Reactor Projects III/IV/V
 Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 148 to DPR-74
2. Safety Evaluation

cc w/enclosures:
 See next page

	*PREVIOUS CONCURRENCE			w/changes	
OFFICE	LA:PD3-1	PM:PD3-1	PM:PD3-1	BC:SRXB	OGC
NAME	Shuttleworth	WLong:jkd	JStang	RJones*	A. JOERGENSEN
DATE	3/19/92	3/19/92	3/20/92	02/19/92	3/13/92
D:PD3-1					
LMarsh					
4/22/92					

4/16/92

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Mr. E. E. Fitzpatrick
Indiana Michigan Power Company

Donald C. Cook Nuclear Plant

cc:

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Monitoring Section Office
Division of Radiological Health
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-316

DONALD C. COOK NUCLEAR PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 148
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 February 15, 1991 and supplemented December 13, 1991, 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.

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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. 148, 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 its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Timothy H. Colburn

L. B. Marsh, Director *for*
Project Directorate III-1
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: April 22, 1992

ATTACHMENT TO LICENSE AMENDMENT NO. 148

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 marginal lines indicating the area of change.

REMOVE

3/4 1-16
B 3/4 1-3

INSERT

3/4 1-16
B 3/4 1-3

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.8 Each of the following borated water sources shall be OPERABLE:

- a. A boric acid storage system and associated heat tracing with:
 - 1. A minimum contained borated water volume of 5650 gallons,
 - 2. Between 20,000 and 22,500 ppm of boron, and
 - 3. A minimum solution temperature of 145°F.

- b. The refueling water storage tank with:
 - 1. A minimum contained borated water volume of 350,000 gallons of water,
 - 2. Between 2400 and 2600 ppm of boron, and
 - 3. A minimum solution temperature of 80°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With the boric acid storage system inoperable, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% Delta k/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

- b. With the refueling water storage tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.8 Each borated water source shall be demonstrated OPERABLE:

3/4.1 REACTIVITY CONTROL SYSTEMS BASES

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The limitation for maximum of one centrifugal charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps and safety injection pumps, except the required OPERABLE charging pump, to be inoperable below 152°F, unless the reactor vessel head is removed, provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

The boration capability of either system is sufficient to provide the required SHUTDOWN MARGIN from expected operating conditions after xenon decay and cooldown to 200°F. The maximum expected boration capability usable volume requirement is 4905 gallons of 20,000 ppm borated water from the boric acid storage tanks or 69,215 gallons of borated water from the refueling water storage tank. The required RWST volume is based on an assumed boron concentration of 2400 ppm. The minimum RWST boron concentration required by the post-LOCA long-term cooling analysis is 2400 ppm. The minimum contained RWST volume is based on ECCS considerations. See Section B 3/4.5.5. The boration source volume from the boric acid storage tanks has conservatively been increased to 5650 gallons. This value was chosen to be consistent with Unit 1.

With the RCS average temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

The boron capability required below 200°F is sufficient to provide the required MODE 5 SHUTDOWN MARGIN after xenon decay and cooldown from 200°F to 140°F. This condition requires usable volumes of either 298 gallons of 20,000 ppm borated water from the boric acid storage tanks or 2408 gallons of borated water from the refueling water storage tank. The boration source volumes of Technical Specification 3.1.2.7 have been conservatively increased to 4300 gallons from the boric acid storage tanks and 90,000 gallons from the refueling water storage tank. These volumes are based on conservative calculations performed for Cycle 6 of Unit 2. The calculations assumed a final MODE 6 RCS boron concentration of 2000 ppm.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.6 and 9.5 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

The OPERABILITY of boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 148 TO FACILITY OPERATING LICENSE NO. DPR-74

INDIANA MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT, UNIT NO. 2

DOCKET NO. 50-316

1.0 INTRODUCTION

By letter dated February 15, 1991, the Indiana Michigan Power Company (the licensee), applied for an amendment to the Donald C. Cook Nuclear Plant, Unit 2 Appendix A, Technical Specifications (TS). The proposed amendment would change TS 3.1.2.8.a.1 boric acid storage tank (BAST) minimum usable fluid volume requirements. The minimum BAST volume for operation in Modes 1 through 4 would be reduced from 7715 to 5650 gallons. The minimum refueling water storage tank (RWST) volume for cooldown would be reduced from 160,122 to 69,215 gallons but the related TS would not be changed due to emergency core cooling system (ECCS) requirements. The TS Bases would also be revised to reflect these and other related changes. By letter dated December 13, 1991, the licensee responded to NRC questions to clarify specific statements in the application and did not alter the action noticed or affect the initial no significant hazards consideration determination published May 15, 1991.

The existing BAST minimum volume requirement of 7715 gallons was established in Amendment 134 which approved TS changes supporting Cycle 8 operation. This requirement was established as a bounding volume to support power uprate to 3588 Mwt, increased fuel enrichment (VANTAGE 5 fuel), reduced control rod notch worth, and changes in vendor methodology (Ref: AEP:NRC:1071E, February 6, 1990). The volume requirement prior to Amendment 134 was 5650 gallons (same as the proposed new requirement).

A discussion and safety evaluation of the proposed changes are presented below.

2.0 DISCUSSION AND EVALUATION

The boron injection systems ensure that negative reactivity control is available during each mode of plant operation. The components provided to perform the boration function include (a) borated water sources, including the BASTs [three 11,000 tanks - one per unit plus one shared spare] and RWST [one 420,000 gallon tank per unit], (b) charging pumps [two centrifugal and one positive displacement pump per unit], (c) separate flow paths, (d) boric acid transfer pumps [two per unit], (e) heat tracing systems and (f) emergency power supplies. Specific operability requirements are specified in the TS

(a), (b), (c), (d), (e) and (f). Only the TS relating to (a) would be affected by the proposed amendment. The design basis for each boration system for Modes 1 through 4 operation is to provide sufficient negative reactivity capability to ensure minimum shutdown margin (i.e., 1% delta-k/k) for cooldown to 200 deg.F after xenon decay. For Modes 5 and 6 operation, the design basis is to provide the required shutdown margin for cooldown from 200 deg.F to 140 deg.F. During Modes 1, 2, 3, and 4, when the reactor coolant system temperature is above 200 deg.F, two borated water sources (BAST and RWST) are required to be operable. During Modes 5 and 6, one borated water source (BAST or RWST) is required to be operable.

For D. C. Cook Unit 2, Cycle 8 was the beginning of a transition from a fuel design by Advanced Nuclear Fuels to a fuel design by Westinghouse. As part of the Unit 2 Cycle 8 reload safety evaluation process, Westinghouse recalculated the BAST volume requirements. At the time of the analysis, detailed calculations of the shutdown boron requirements had yet to be performed. Therefore, Westinghouse conservatively estimated bounding final boron concentration requirements for Unit 2 by using Unit 1 data with additional conservatism added to compensate for differences between the units. Unit 1 has a 15 X 15 fuel design and Unit 2 has a 17 X 17 fuel design. The end result was the current Unit 2 TS requiring a minimum BAST volume of 7715 gallons and a minimum RWST volume of 160,122 gallons.

When the Unit 2 specific boron concentrations had been calculated, the additional conservatism were no longer needed. The licensee had two additional reasons to modify the minimum level in the BAST. First, there was a perceived increased potential for maintenance problems with the higher boron levels. Second, there was a potential for human error due to differences between minimum levels required in the BAST between Units 1 and 2. Therefore, Westinghouse was tasked to reanalyze the minimum boron volume necessary for compliance with the Unit 2 boron system design basis.

The reanalysis assumed core physics parameters associated with the Cycle 8 core design with appropriate conservatism to bound subsequent reload core designs. Specifically, the revised calculations contain approximately a 10% margin difference between Mode 1 and Mode 4 boron concentrations to bound future cycles. The recalculated minimum BAST boration volume necessary to cooldown from Mode 1 to Mode 4 is 4905 gallons. However, the licensee proposes to establish a Unit 2 TS minimum limit of 5650 gallons in the BAST consistent with the Unit 1 TS. Also for Unit 2, the minimum volume in the RWST necessary for cooldown from Mode 1 to Mode 4 was calculated to be 69,215

gallons. For cooldown from Mode 5 to Mode 6, the recalculated minimum BAST volume is 298 gallons and the minimum RWST volume is 2408 gallons to accommodate the cooldown.

The licensee's application states that the "Border" code was utilized in the reanalysis. Border is used by Westinghouse to determine if boron requirements dictated by core design are within TS and FSAR limits. The Border code has not been reviewed by the staff for use as part of licensee's or vendor's reload methodology. The decision herein is not based on the Border Code so it is not necessary for the code to be approved. By letter dated December 13, 1991, the licensee stated that the Border code automates tasks previously performed manually and the underlying methodology does not differ from that used in the past to calculate minimum boron concentrations. Based on the fact that the underlying methodology has not changed from similar calculations, the staff concludes that the results of the licensee's analysis are acceptable.

Based on the licensee's reanalysis, the staff concludes there is sufficient basis to relax the existing TS for minimum required BAST volume. The licensee's proposal to revise the minimum BAST volume to 5650 gallons, a value consistent with Unit 1 and conservative with respect to the calculated required value of 4905 is acceptable. The TS for minimum required RWST volume is 350,000 gallons. This is volume based on ECCS requirements and is not affected by the proposed amendment, however, the Bases will be revised accordingly.

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 amendment changes requirements with respect to the 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 these amendments involve no significant hazards consideration and there has been no public comment on such finding (56 FR 22469). Accordingly, these 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 these 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 the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: April 22, 1992

Principal Contributor: H. Abelson

DATED: April 22, 1992

AMENDMENT NO. 148 TO FACILITY OPERATING LICENSE NO. DRP-74-D. C. COOK

Docket File
NRC & Local PDRs
PDIII-1 Reading
D.C. Cook Plant File
B. Boger
J. Zwolinski
L. Marsh
M. Shuttleworth
W. Long
J. Stang
OGC-WF
D. Hagan, 3302 MNBB
G. Hill (4), P-137
Wanda Jones, MNBB-7103
C. Grimes, 11/F/23
R. Jones
ACRS (10)
GPA/PA
OC/LFMB
W. Shafer, RIII

cc: Plant Service list