

SEP 02 1982

Docket Nos. 50-315
and 50-316

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Mr. John Dolan, Vice President
Indiana and Michigan Electric Company
Post Office Box 18
Bowling Green Station
New York, New York 10004

Dear Mr. Dolan:

The Commission has issued the enclosed Amendment No. 57 to Facility Operating License No. DPR-58 and Amendment No. 41 to Facility Operating License No. DPR-74 for the Donald C. Cook Nuclear Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications in response to your application transmitted by letter dated April 7, 1982, as supplemented by letters dated June 11, 1982, June 30, 1982, and July 8, 1982.

These amendments revises the Technical Specifications to permit storage of Exxon fuel with a uranium enrichment of less than or equal to 3.84 weight percent of U-235.

Our action in response to your request for a power increase will be addressed in a separate letter.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

~~ORIGINAL SIGNED~~

Ramon L. Cilimberg, Project Manager
Operating Reactors Branch #1
Division of Licensing

Enclosures:

1. Amendment No. 57 to DPR-58
2. Amendment No. 41 to DPR-74
3. Safety Evaluation
4. Notice of Issuance

cc w/enclosures:
See next page

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Mr. John Dolan
Indiana and Michigan Electric Company

cc: Mr. Robert W. Jurgensen
Chief Nuclear Engineer
American Electric Power
Service Corporation
2 Broadway
New York, New York 10004

Gerald Charnoff, Esquire
Shaw, Pittman, Potts and Trowbridge
1800 M Street, N.W.
Washington, D. C. 20036

Maude Preston Palenske Memorial
Library
500 Market Street
St. Joseph, Michigan 49085

W. G. Smith, Jr., Plant Manager
Donald C. Cook Nuclear Plant
P. O. Box 458
Bridgman, Michigan 49106

U. S. Nuclear Regulatory Commission
Resident Inspectors Office
7700 Red Arrow Highway
Stevensville, Michigan 49127

Mr. Wade Schuler, Supervisor
Lake Township
Baroda, Michigan 49101

Mr. William R. Rustem (2)
Office of the Governor
Room 1 - Capitol Building
Lansing, Michigan 48913

Honorable James Bemnek, Mayor
City of Bridgman, Michigan 49106

Regional Radiation Representative
EPA Region V
230 South Dearborn Street
Chicago, Illinois 60604

Maurice S. Reizen, M.D.
Director
Department of Public Health
P.O. Box 30035
Lansing, Michigan 48109

William J. Scanlon, Esquire
2034 Pauline Boulevard
Ann Arbor, Michigan 48103

The Honorable Tom Corcoran
United States House of Representatives
Washington, D. C. 20515

James G. Keppler
Regional Administrator - Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137



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

INDIANA AND MICHIGAN ELECTRIC COMPANY

DOCKET NO. 50-315

DONALD C. COOK NUCLEAR PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 57
License No. DPR-58

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Indiana and Michigan Electric Company (the licensee) dated April 7, 1982, supplemented by letters dated June 11, 1982, June 30, 1982 and July 8, 1982, 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.

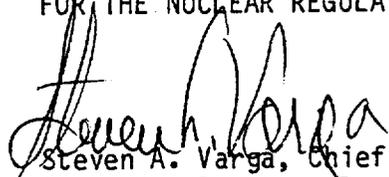
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-58 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 57, 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


Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 2, 1982

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 57 TO FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

Revise Appendix A as follows:

Remove Pages

5-5

5-6*

Insert Pages

5-5

5-6*

*Included for convenience

- a. In accordance with the code requirements specified in Section 4.1.6 of the FSAR, with allowance for normal degradation pursuant to the applicable Surveillance Requirements,
- b. For a pressure of 2485 psig, and
- c. For a temperature of 650°F, except for the pressurizer which is 680°F.

VOLUME

5.4.2 The total contained volume of the reactor coolant system is 12,612 ± 100 cubic feet at a nominal T_{avg} of 70°F.

5.5 EMERGENCY CORE COOLING SYSTEMS

5.51 The emergency core cooling systems are designed and shall be maintained in accordance with the original design provisions contained in Section 6.2 of the FSAR with allowance for normal degradation pursuant to the applicable Surveillance Requirements.

5.6 FUEL STORAGE

CRITICALITY - SPENT FUEL

5.6.1.1: The spent fuel storage racks are designed and shall be maintained with:

- a. A k_{eff} equivalent to less than 0.95 when flooded with unborated water,
- b. A nominal 10.5 inch center-to-center distance between fuel assemblies placed in the storage racks.

5.6.1.2 Fuel stored in the spent fuel storage racks shall have a nominal fuel assembly enrichment as follows:

<u>Fuel Type</u>	<u>Description</u>	<u>Maximum Nominal Fuel Assembly Enrichment Wt. % ²³⁵U</u>
I	Westinghouse 15 x 15	3.50
II	Exxon 15 x 15	3.50
III	Westinghouse 17 x 17	3.50
IV	Exxon 17 x 17	3.84

CRITICALITY - NEW FUEL

5.6.2 The new fuel pit storage racks are designed and shall be maintained with a nominal 21 inch center-to-center distance between new fuel assemblies such that K_{eff} will not exceed 0.98 when Fuel Types I, II, III and IV (as defined in Section 5.6.1.2) are placed in the pit and aqueous foam moderation is assumed.

DESIGN FEATURES

DRAINAGE

5.6.3 The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 629'4".

CAPACITY

5.6.4 The fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 2050 fuel assemblies.

5.7 SEISMIC CLASSIFICATION

5.7.1 Those structures, systems and components identified as Category I Items in the FSAR shall be designed and maintained to the original design provisions contained in the FSAR with allowance for normal degradation pursuant to the applicant Surveillance Requirements.

5.8 METEOROLOGICAL TOWER LOCATION

5.8.1 The meteorological tower shall be located as shown on Figure 5.1-1.

5.9 COMPONENT CYCLIC OR TRANSIENT LIMIT

5.9.1 The components identified in Table 5.9-1 are designed and shall be maintained within the cyclic or transient limits of Table 5.9-1.



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

INDIANA AND MICHIGAN ELECTRIC COMPANY

DOCKET NO. 50-316

DONALD C. COOK NUCLEAR PLANT UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 41
License No. DPR-74

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Indiana and Michigan Electric Company (the licensee) dated April 7, 1982, supplemented by letters dated June 11, 1982, June 30, 1982 and July 8, 1982, 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.

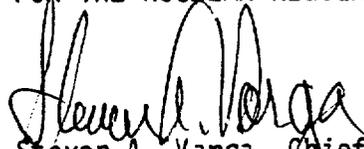
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-74 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 41, 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



Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 2, 1982

ATTACHMENT TO LICENSE AMENDMENT

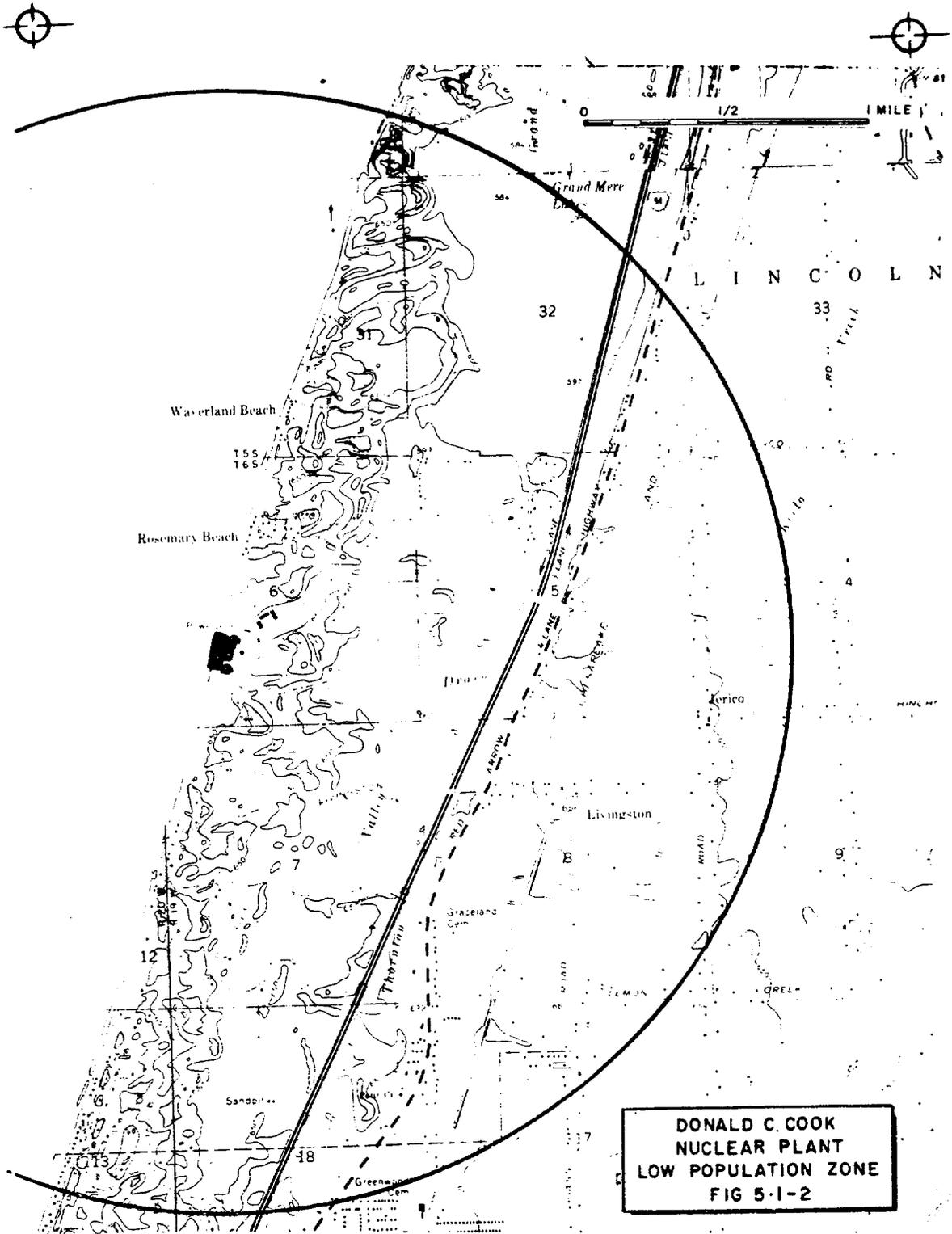
AMENDMENT NO. 41 TO FACILITY OPERATING LICENSE NO. DPR-74

DOCKET NO. 50-316

Revise Appendix A as follows:

<u>Remove Pages</u>	<u>Insert Pages</u>
5-3*	5-3*
5-4	5-4
5-5	5-5
5-6*	5-6*

*Included for convenience



DESIGN FEATURES

5.3 REACTOR CORE

FUEL ASSEMBLIES

5.3.1 The reactor core shall contain 193 fuel assemblies with each fuel assembly containing 264 fuel rods clad with Zircaloy -4. Each fuel rod shall have a nominal active fuel length of 144 inches and contain a maximum total weight of 1983 grams uranium. The initial core loading shall have a maximum enrichment of 3.3 weight percent U-235. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum nominal enrichment of 3.84 weight percent U-235.

CONTROL ROD ASSEMBLIES

5.3.2 The reactor core shall contain 53 full length and no part length control rod assemblies. The full length control rod assemblies shall contain a nominal 142 inches of absorber material. The nominal values of absorber material shall be 80 percent silver, 15 percent indium and 5 percent cadmium. All control rods shall be clad with stainless steel tubing.

5.4 REACTOR COOLANT SYSTEM

DESIGN PRESSURE AND TEMPERATURE

- 5.4.1 The reactor coolant system is designed and shall be maintained:
- a. In accordance with the code requirements specified in Section 4.1.6 of the FSAR, with allowance for normal degradation pursuant to the applicable Surveillance Requirements.
 - b. For a pressure of 2425 psig, and
 - c. For a temperature of 650°F, except for the pressurizer which is 620°F.

VOLUME

5.4.2 The total water and steam volume of the reactor coolant system is $12,612 \pm 100$ cubic feet as a nominal T_{avg} of 70°F .

5.5 METEOROLOGICAL TOWER LOCATION

5.5.1 The meteorological tower shall be located as shown on Figure 5.1-1.

5.6 FUEL STORAGE

CRITICALITY - SPENT FUEL

5.6.1.1 The spent fuel storage racks are designed and shall be maintained with:

- a. A K_{eff} equivalent to less than 0.95 when flooded with unborated water,
- b. A nominal 10.5 inch center-to-center distance between fuel assemblies, placed in the storage racks.

5.6.1.2 Fuel stored in the spent fuel storage racks shall have a nominal fuel assembly enrichment as follows:

<u>Fuel Type</u>	<u>Description</u>	<u>Maximum Nominal Fuel Assembly Enrichment Wt. % ^{235}U</u>
I	Westinghouse 15 x 15	3.50
II	Exxon 15 x 15	3.50
III	Westinghouse 17 x 17	3.50
IV	Exxon 17 x 17	3.84

CRITICALITY - NEW FUEL

5.6.2 The new fuel pit storage racks are designed and shall be maintained with a nominal 21 inch center-to-center distance between new fuel assemblies such that K_{eff} will not exceed 0.98 when Fuel Types I, II, III and IV (as defined in Section 5.6.1.2) are placed in the pit and aqueous foam moderation is assumed.

DESIGN FEATURES

DRAINAGE

5.6.3 The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 629'4".

CAPACITY

5.6.4 The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 2050 fuel assemblies.

5.7 COMPONENT CYCLIC OR TRANSIENT LIMIT

5.7.1 The components identified in Table 5.7-1 are designed and shall be maintained within the cyclic or transient limits of Table 5.7-1.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 57 TO FACILITY OPERATING LICENSE NO. DPR-58
AND AMENDMENT NO. 41 TO FACILITY OPERATING LICENSE NO. DPR-74
INDIANA AND MICHIGAN ELECTRIC COMPANY
DONALD C. COOK NUCLEAR PLANT UNIT NOS. 1 AND 2
DOCKET NOS. 50-315 AND 50-316

INTRODUCTION

By letter dated April 7, 1982, as supplemented by letters dated June 11, 1982, June 30, 1982, and July 8, 1982, the Indiana and Michigan Electric Company (the licensee) proposed changes to the Technical Specifications 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 changes consist of changes to permit storage of Exxon fuel with a uranium enrichment of 3.84 weight percent of U-235 in the new and spent fuel storage racks. The acceptability of these changes from a safety standpoint are discussed below.

A separate Safety Evaluation Report will address the request for a power increase.

DISCUSSION AND EVALUATION

Indiana and Michigan Electric Company has proposed revision of Technical Specifications to increase the enrichment of fuel permitted to be stored in the new and spent fuel storage racks to accommodate the Exxon Nuclear Company (ENC) designed fuel which is to be used in Cycle 4. The present Technical Specification limit on enrichment is 3.5 weight percent U-235 with an axial loading of 44.22 grams of U-235 per axial centimeter. The most reactive ENC design assembly has an enrichment of 3.84 weight percent with an axial loading of 43.29 grams of U-235 per centimeter. The reduction in axial loading is the result of smaller diameter pellets in the ENC design which increases the water to fuel ratio and thus the reactivity of the assembly.

The spent fuel pool racks were installed in 1980. They were designed by Exxon and are described in Reference 1 along with the criticality analysis (also performed by Exxon). The NRC evaluation of the racks and the criticality analysis is presented in Reference 2. That evaluation concludes that acceptable analysis methods which have been verified by comparison with experiment were used. The same methods are used for the present analysis. In particular the use of the CCELL code for performing sensitivity studies is the same for both sets of analyses.

The effective multiplication factor for the spent fuel pool when loaded with the most reactive Exxon fuel assemblies is 0.946 at the 95 percent confidence level if nominal enrichment and boron loading values are used. All other parameters are taken at their worst case values including pool water temperature which is assumed to be 4 degrees Centigrade. If maximum enrichment and minimum boron loading (at the 95 percent confidence value) are considered the value is 0.949 including all uncertainties. This meets our acceptance criterion of less than or equal to 0.95 and is acceptable.

The fresh fuel racks at the D. C. Cook facility were also reanalyzed for the more reactive Exxon fuel. The KENO IV code was used to obtain the effective multiplication factor as a function of moderator density. The maximum array size (12 rack modules) was used (ie., an infinite array was not assumed as was done for the spent fuel racks). The effect of the concrete reflector around the storage pit was included. The resultant effective multiplication factor was 0.920 at full water density for the highest reactivity Exxon fuel for the maximum enrichment at the 95 percent confidence level. This meets our acceptance criterion of 0.95 for this quantity and is acceptable. -

The effect of flooding the racks with low hydrogen density moderator (water spray, foams, etc.) was examined by calculating the pool effective multiplication factor as a function of water density. This value first decreases as water density is reduced then increases again, reaching

a secondary peak at approximately 5 percent water density, and decreases again as the density is further lowered. The value of the effective multiplication factor at the secondary peak was 0.849 which meets our acceptance criterion of less than or equal to 0.98 for this quantity and is acceptable.

Based on the discussion presented above we conclude that any number of fuel assemblies of the Exxon increased reactivity design having a uranium enrichment of less than or equal to 3.84 weight percent U-235 may be stored in the spent fuel storage racks. We further conclude that up to 12 of the rack modules in the fresh fuel storage pit (i.e., the whole pit) may be loaded with these assemblies.

We further conclude that proposed Technical Specifications 5.6.1.2 for Units 1 and 2 and Specification 5.3.1 for Unit 2 are acceptable.

References

1. Letters: American Electric Power to NRC dated November 22, 1978, January 22, 1979, and April 16, 1979.
2. Amendment No. 32 to Facility Operating License No. DPR-58 and Amendment No. 13 to Facility Operating License No. DPR-74 for the D. C. Cook Nuclear Plant, Unit Nos. 1 and 2 dated October 16, 1979.

ENVIRONMENTAL CONSIDERATION

We have determined that the amendments do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendments involve an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR 51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendments do not involve a significant decrease in the probability or consequences of an accident previously evaluated, do not create the possibility of an accident of a type different from any evaluated previously, and do not involve a significant reduction in a margin of safety, the amendments do not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: September 2, 1982

Principal Contributor:

Walter Brooks

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NOS. 50-315 AND 50-316INDIANA AND MICHIGAN ELECTRIC COMPANYNOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 57 to Facility Operating License No. DPR-58, and Amendment No. 41 to Facility Operating License No. DPR-74 issued to Indiana and Michigan Electric Company (the licensee), which revised Technical Specifications for operation of Donald C. Cook Nuclear Plant, Unit Nos. 1 and 2 (the facilities) located in Berrien County, Michigan. The amendments are effective as of the date of issuance.

The amendments revised the Technical Specifications to permit storage of Exxon fuel with a uranium enrichment of less than or equal to 3.84 weight percent of U-235.

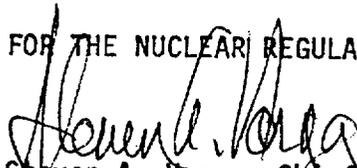
The application for the amendments complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendments. Prior public notice of these amendments was not required since the amendments do not involve a significant hazards consideration.

The Commission has determined that the issuance of these amendments will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of these amendments.

For further details with respect to this action, see (1) the application for amendments dated April 7, 1982, as supplemented by letters dated June 11, 1982, June 30, 1982, and July 8, 1982, (2) Amendment Nos. 57 and 41 to License Nos. DPR-58 and DPR-74, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at the Maude Reston Palenske Memorial Library, 500 Market Street, St. Joseph, Michigan 49085. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Licensing.

Dated at Bethesda, Maryland, this 2nd day of September, 1982.

FOR THE NUCLEAR REGULATORY COMMISSION


Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing