Docket File 50-315

REGULATORY DOCKET FILE COPY

JULY 3 1979

Docket No. 50-315

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

Dear Mr. Dolan:

The Commission has issued the enclosed Amendment No. 30 to Facility Operating License No. DPR-58 for the Donald C. Cook Nuclear Plant, Unit 1. The amendment consists of a change to the Appendix A Technical Specifications and responds to your application dated April 23, 1979.

This change permits operation with a slightly positive moderator temperature coefficient below 70% of rated thermal power.

This amendment also reflects certain changes or differences from your application. These changes have been discussed with and agreed to by your staff.

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

Sincerely,

Original Signed By

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosures:
1. Amendment No. 30 to DPR-58
2. Safety Evaluation Report
4. Notice of Issuance

cc: w/enclosures
See next page

CP 1

TAC #11633

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OFFICE	DOR:ORB1	DOR:ORB1	DOR:STSG	DOR:AD:S&P	OELD	DOR:ORB1
SURNAME	DWiggington:jb	CSParrish	DBrinkman	RHVollmer	R BLACK	ASchwencer
DATE	06/18/79	06/18/79	7/2/79	06/18/79	06/21/79	06/18/79

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

July 3, 1979

Docket No. 50-315

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Indiana and Michigan Electric Company
Indiana and Michigan Power Company
Post Office Box 18
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New York, New York 10004

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Sincerely,

A. Schwencer

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

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cc: w/enclosures
See next page

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

Citizens for a Better Environment
59 East Van Buren Street
Chicago, Illinois 60605

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

Mr. D. Shaller, Plant Manager
Donald C. Cook Nuclear Plant
P. O. Box 458
Bridgman, Michigan 49106

Mr. R. Masse
Donald C. Cook Nuclear Plant
P. O. Box 458
Bridgman, Michigan 29160

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

Attorney General
Department of Attorney General
525 West Ottawa Street
Lansing, Michigan 48913

Honorable James Bemenek, Mayor
City of Bridgman, Michigan 49106

Director, Technical Assessment Division
Office of Radiation Programs (AW-459)
U. S. Environmental Protection Agencyt
Crystal Mall #2
Arlington, Virginia 20460

U. S. Environmental Protection Agency
Federal Activities Branch
Region V Office
ATTN: EIS COORDINATOR
230 South Dearborn Street
Chicago, Illinois 60604

Attorney General
State House
Indianapolis, Indiana 46204

State Board of Health
ATTN: Director, Bureau of Engineering
1330 West Michigan Street
Indianapolis, Indiana 46206

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

INDIANA AND MICHIGAN ELECTRIC COMPANY

INDIANA AND MICHIGAN POWER COMPANY

DOCKET NO. 50-315

DONALD C. COOK NUCLEAR PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 30
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 and Indiana & Michigan Power Company (the licensees) dated April 23, 1979, 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:

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(2) Technical Specification

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 30 , are hereby incorporated in the license. The licensees 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

A. Schwencer

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: July 3, 1979

ATTACHMENT TO LICENSE AMENDMENT NO. 30

FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

Replace page 3/4 1-5 of the Appendix "A" Technical Specifications with the enclosed page. The revised page is identified by Amendment number and contains vertical lines indicating the areas of change. The corresponding overleaf page is also provided for document completeness.

MODERATOR TEMPERATURE COEFFICIENT

LIMITING CONDITION FOR OPERATION

3.1.1.4 The moderator temperature coefficient (MTC) shall be:

a. $\leq 0.5 \times 10^{-4}$ Δ k/k/°F below 70% RATED THERMAL POWER,

b. $\leq 0.0 \times 10^{-4}$ Δk/k/°F at or above 70% RATED THERMAL POWER, and

c. Less negative than -3.5×10^{-4} Δk/k/°F at RATED THERMAL POWER.

APPLICABILITY: MODES 1 and 2*#

ACTION:

With the moderator temperature coefficient outside any one of the above limits, be in HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.1.4.1 The MTC shall be determined to be within its limits by confirmatory measurements. MTC measured values shall be extrapolated and/or compensated to permit direct comparison with the above limits.

4.1.1.4.2 The MTC shall be determined at the following frequencies and THERMAL POWER conditions during each fuel cycle:

a. Prior to initial operation above 5% of RATED THERMAL POWER, after each fuel loading.

b. At any THERMAL POWER, within 7 EFPD after reaching a RATED THERMAL POWER equilibrium boron concentration of 300 ppm.

*With $K_{eff} \geq 1.0$

#See Special Test Exception 3.10.4

MINIMUM TEMPERATURE FOR CRITICALITY

LIMITING CONDITION FOR OPERATION

3.1.1.5 The Reactor Coolant System lowest operating loop temperature (T_{avg}) shall be $\geq$ 541°F when the reactor is critical.

APPLICABILITY: MODES 1 and 2*#.

ACTION:

With a Reactor Coolant System operating loop temperature (T_{avg}) < 541°F, restore (T_{avg}) to within its limit within 15 minutes or be in HOT STANDBY within the next 15 minutes.

SURVEILLANCE REQUIREMENTS

4.1.1.5 The Reactor Coolant System temperature (T_{avg}) shall be determined to be $\geq$ 541°F:

a. Within 15 minutes prior to achieving reactor criticality, and

b. At least once per 30 minutes when the reactor is critical and the Reactor Coolant System T_{avg} is less than 551°F.

*See Special Test Exception 3.10.3

#With $K_{eff} \geq 1.0$.

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

SAFETY EVALUATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

LICENSE NO. DPR-58

INDIANA AND MICHIGAN POWER COMPANY

DONALD C. COOK, UNIT 1

DOCKET NO. 50-315

Introduction

By letter dated April 23, 1979, Indiana and Michigan Power Company, the licensee for D. C. Cook 1, requested a Technical Specification change which would allow operation with a postive moderator temperature coefficient (MTC). Through discussions between the staff and American Electrical Power Service Company, a revised change was developed that is acceptable to us and to the licensee. This change would allow operation with a slightly positive MTC (less than or equal to 5.0 pcm/°F*) when the reactor power level is<70% of rated thermal power. At or above 70% power, the MTC must be zero or negative. If the MTC falls outside of these limits, the reactor must be in HOT STANDBY within six hours.

Discussion

At beginning of cycle (with little xenon present, at low power, and with a relatively high boron concentration) a positive MTC condition can exist. To compensate for this, control rods must be inserted during power escalation. If a larger positive MTC exists than can be compensated for by inserted control rods (within the constraints of the power-dependent insertion limits), return to power cannot be accomplished. To alleviate these problems, the licensee has requested an amendment to allow operation with a slightly positive MTC at low power conditions (less than 70% power). Above 70% power, the MTC must be zero or negative. At full power the MTC must be -3.5 pcm/°F or more negative.

Evaluation

Plant transient analyses for D. C. Cook 1 with a slightly positive MTC were performed for the licensee by the Exxon Nuclear Company. The evaluation model employed was consistent with approved methods as

*pcm/°F = 10^{-5} $\Delta k/k/°F$

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detailed in Exxon Report XN-76-35, Plant Transient Analysis for the D. C. Cook Plant. Design uncertainty factors were applied to the neutronic and thermal parameters.

Those transients for which a less negative MTC is more severe were selected for reanalysis. These are plant heatup events and include:

Loss of load at beginning of cycle (BOC)
Locked rotor at BOC
Loss of flow at BOC
Fast and slow uncontrolled rod withdrawal at BOC

Non-Rod Withdrawal Transients

These transients were evaluated at 102% power with a +5.0 pcm/°F MTC. This bounds the worst case, since a zero or negative MTC is required for power levels above 70% power, and these events are most severe at high initial powers.

For non-rod withdrawal transients, the more positive MTC results in higher peak core power, a higher reactor coolant pressure and a reduction in the minimum departure from nucleate boiling ratio (MDNBR). The MDNBR for the most limiting event, the locked rotor, is 1.79, which is substantially greater than the plant design basis limit of 1.30.

Rod Withdrawal Transients

Also, rod withdrawal transients were evaluated at 102% power with a +5.0 pcm/°F MTC. The limiting fast and slow withdrawal rates based on previous analyses were considered. For these events, although the positive MTC contributes to increased power, sufficient moderator and fuel thermal lag exist that the clad heat flux is not significantly increased before reactor scram. The MDNBR did not change when the MTC was changed from 0.0 pcm/°F to 5.0 pcm/°F.

With the changing feedback effects due to the positive MTC, the limiting combinations of reactivity insertion rates and initial power level may shift from the cases analyzed with a zero MTC. However, as shown in the D. C. Cook 1 FSAR, the effect on the limiting DNBR would be small due to the complementary protective features of high neutron flux, high pressurizer pressure and over-temperature ΔT trips. The MDNBR for the rod withdrawal events as reported in the reanalysis was 2.15, which was unchanged from the previous Exxon analysis of the comparable case, and is well above the allowable limit of 1.30. Thus, adequate margin to thermal limits exist for the range of possible rod withdrawal transients.

LOCA and Other Accident Analyses

Since the MTC above 70% power must be zero or negative, the previous accident analysis, including LOCA, are still applicable. Cooldown incidents, such as steam line break, will be less severe with a more positive MTC, and are thus bounded by previous analyses.

Summary

We have reviewed the transient analyses submitted to support operation at less than 70% power with a MTC no more positive than 5.0 pcm/°F and conclude that such operation will not lead to violation of any safety limits. Therefore, this Technical Specification change is acceptable.

Environmental Consideration

We have determined that this amendment does 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 amendment involves 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 this amendment.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequecnes of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: July 3, 1979

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UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-315

INDIANA AND MICHIGAN ELECTRIC COMPANY

INDIANA AND MICHIGAN POWER COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 30 to Facility Operating License No. DPR-58 issued to Indiana and Michigan Electric Company and Indiana and Michigan Power Company (the licensees), which revised the Technical Specifications for operation of the Donald C. Cook Nuclear Plant, Unit No. 1 (the facility), located in Berrien County, Michigan. The amendment is effective as of the date of its issuance.

The amendment revises the Technical Specifications to permit operation with a slightly positive moderator temperature coefficient below 70% of rated thermal power.

The application for amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

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

For further details with respect to this action, see (1) the April 23, 1979 application for amendment, (2) Amendment No. 30 to Facility Operating License No. DPR-58 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 single 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 Operating Reactors.

Dated at Bethesda, Maryland, this 3rd day of July, 1979.

FOR THE NUCLEAR REGULATORY COMMISSION

A. Schwencer

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors