REGULATORY DOCKET FILE COPY

DOCKET FILE 50-315

Docket No. 50-315

July 25, 1980

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. 38 to Facility Operating License No. DPR-58 for the Donald C. Cook Nuclear Plant, Unit No. 1. The amendment consists of changes to the Technical Specifications in response to your application transmitted by letter dated May 12, 1980.

These amendments revises the Unit 1 Technical Specifications to allow operation of the unit with Exxon Nuclear Company (ENC) power distribution control procedures.

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

Sincerely,

Original signed by:
S. A. Varga

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

Enclosures:
1. Amendment No. 3- to DPR-58
2. Safety Evaluation
3. Notice of Issuance

cc: w/enclosures
See next page

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

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cc: w/enclosures
See next page

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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. 38
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 May 12, 1980, 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-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. 38 , 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: July 25, 1980

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 38 TO FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

Revise Appendix A as follows:

Remove Pages	Insert Pages
3/4 2-1	3/4 2-1
3/4 2-2	3/4 2-2
3/4 2-3	3/4 2-3
3/4 2-4	3/4 2-4
3/4 2-5	3/4 2-5
3/4 2-6	3/4 2-6
3/4 2-7	3/4 2-7
	3/4 2-8a
3/4 2-15	3/4 2-15
3/4 2-16	3/4 2-16
3/4 2-17	3/4 2-17
3/4 2-18	3/4 2-18
3/4 2-21	
B3/4 2-2	B3/4 2-2
B 3/4 2-6	B 3/4 2-6

3/4.2 POWER DISTRIBUTION LIMITS

AXIAL FLUX DIFFERENCE (AFD)

LIMITING CONDITION FOR OPERATION

3.2.1 The indicated AXIAL FLUX DIFFERENCE (AFD) shall be maintained within a ±5% target band (flux difference units) about a target flux difference.

APPLICABILITY: MODE 1 above 50% RATED THERMAL POWER*

ACTION:

a. With the indicated AXIAL FLUX DIFFERENCE outside of the ±5% target band about the target flux difference and with THERMAL POWER:

1. Above 90% or 0.9 x APL** (whichever is less) of RATED THERMAL POWER, within 15 minutes:

a) Either restore the indicated AFD to within the target band limits, or

b) Reduce THERMAL POWER to less than 90% or 0.9 x APL (whichever is less) of RATED THERMAL POWER.

2. Between 50% and 90% or 0.9 x APL (whichever is less) of RATED THERMAL POWER:

a) POWER OPERATION may continue provided:

1) The indicated AFD has not been outside of the ±5% target band for more than 1 hour penalty deviation cumulative during the previous 24 hours, and

2) The indicated AFD is within the limits shown on Figure 3.2-1. Otherwise, reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 30 minutes and reduce the Power Range Neutron Flux-High Trip Setpoints to ≤ 55% of RATED THERMAL POWER within the next 4 hours.

b) Surveillance testing of the Power Range Neutron Flux Channels may be performed pursuant to Specification 4.3.1.1.1 provided the indicated AFD is maintained within the limits of Figure 3.2-1. A total of 16 hours operation may be accumulated with the AFD outside of the target band during this testing without penalty deviation.

* See Special Test Exception 3.10.2
** APL is the Allowable Power Level defined in Specification 3.2.6.

LIMITING CONDITION FOR OPERATION (Continued)

c) Surveillance testing of the APDMS may be performed pursuant to Specification 4.3.3.6.1 provided the indicated AFD is maintained within the limits of Figure 3.2-1. A total of 6 hours of operation may be accumulated with the AFD outside of the target band during this testing without penalty deviation.

b. THERMAL POWER shall not be increased above 90% or 0.9 x APL (whichever is less) of RATED THERMAL POWER unless the indicated AFD is within the ± 5% target band and ACTION 2.a) 1), above has been satisfied.

c. THERMAL POWER shall not be increased above 50% of RATED THERMAL POWER unless the indicated AFD has not been outside of the ± 5% target band for more than 1 hour penalty deviation cumulative during the previous 24 hours.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The indicated AXIAL FLUX DIFFERENCE shall be determined to be within its limits during POWER OPERATION above 15% of RATED THERMAL POWER by:

a. Monitoring the indicated AFD for each OPERABLE excore channel:

1. At least once per 7 days when the AFD Monitor Alarm is OPERABLE, and

2. At least once per hour for the first 24 hours after restoring the AFD Monitor Alarm to OPERABLE status.

b. Monitoring and logging the indicated AXIAL FLUX DIFFERENCE for each OPERABLE excore channel at least once per hour for the first 24 hours and at least once per 30 minutes thereafter, when the AXIAL FLUX DIFFERENCE Monitor Alarm is inoperable. The logged values of the indicated AXIAL FLUX DIFFERENCE shall be assumed to exist during the interval preceding each logging.

SURVEILLANCE REQUIREMENTS (Continued)

4.2.1.2 The indicated AFD shall be considered outside of its ± 5% target band when at least 2 of 4 or 2 of 3 OPERABLE excore channels are indicating the AFD to be outside the target band. Penalty deviation outside of the ± 5% target band shall be accumulated on a time basis of:

a. A penalty deviation of one minute for each one minute of POWER OPERATION outside of the target band at THERMAL POWER levels equal to or above 50% of RATED THERMAL POWER, and

b. A penalty deviation of one half minute for each one minute of POWER OPERATION outside of the target band at THERMAL POWER levels below 50% of RATED THERMAL POWER.

4.2.1.3 The target axial flux difference of each OPERABLE excore channel shall be determined in conjunction with the measurement of $F_Q^M(z)$ as defined in Specification 4.2.2.2.C. The provisions of Specification 4.0.4 are not applicable.

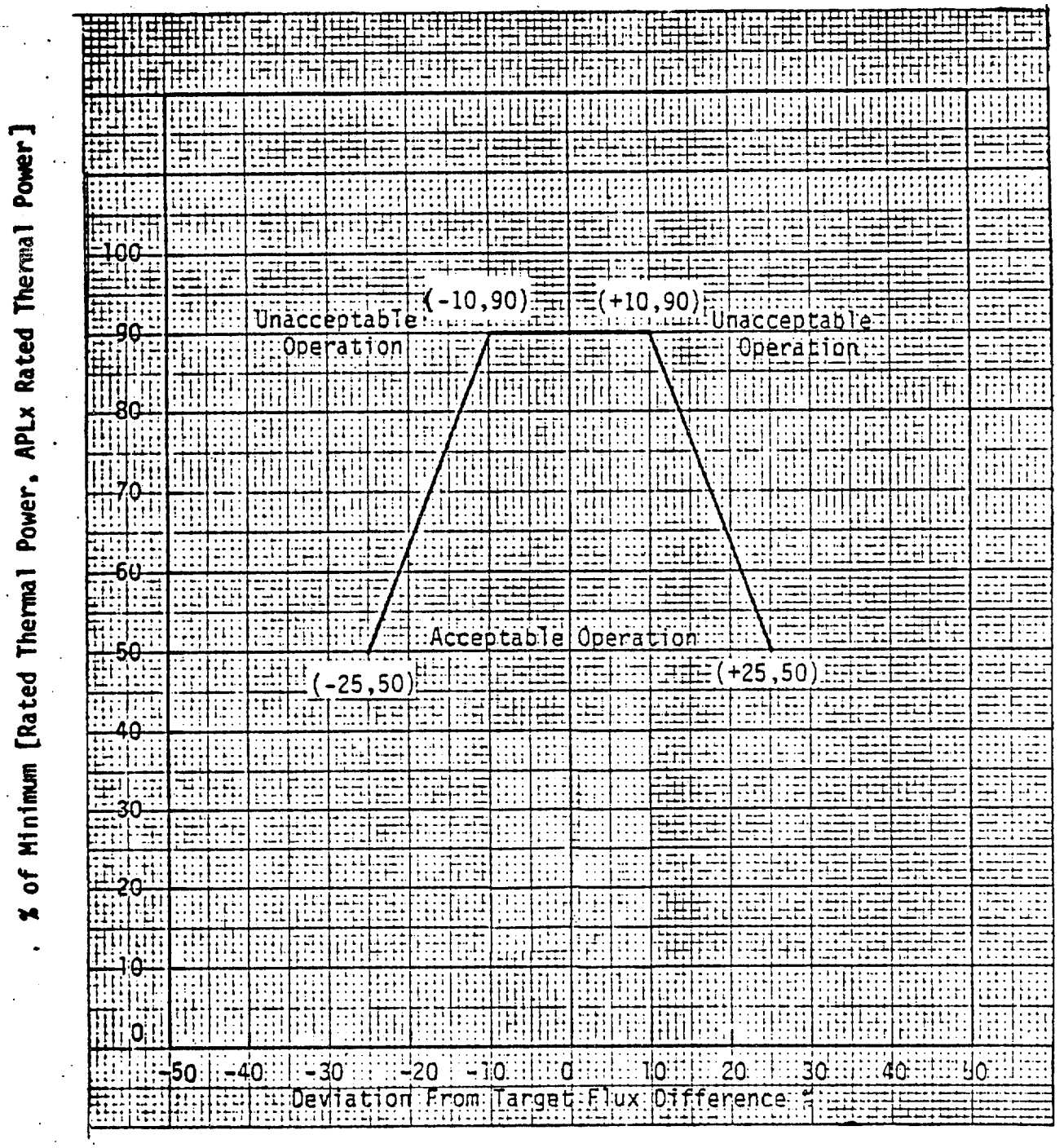

Figure 3.2-1 ALLOWABLE DEVIATION FROM TARGET FLUX DIFFERENCE

HEAT FLUX HOT CHANNEL FACTOR-$F_Q(Z)$

LIMITING CONDITION FOR OPERATION

3.2.2 $F_Q(Z,\ell)$ shall be limited by the following relationships:

$$F_Q(Z,\ell) \leq \frac{[F_Q^L(E_\ell)]}{P} [K(Z)] \text{ for } P > 0.5$$

$$F_Q(Z,\ell) \leq 2\ [F_Q^L(E_\ell)]\ [K(Z)] \text{ for } P \leq 0.5$$

$$\text{where } P = \frac{\text{THERMAL POWER}}{\text{RATED THERMAL POWER}}$$

$F_Q^L(E_\ell)$ is the exposure dependent F_Q limit for rod ℓ and is defined on Figure 3.2-3a for Exxon Nuclear fuel, Figure 3.2-3b for Westinghouse fuel and page 3/4 2-15. E_ℓ is the maximum pellet exposure in rod ℓ. K(Z) is the function obtained from Figure 3.2-2 for a given core height location.
F_Q is defined as the $F_Q(Z,\ell)$ with the smallest margin or the greatest excess of the limit.

APPLICABILITY: MODE 1

ACTION:

With F_Q exceeding its limit:

a. Comply with either of the following ACTIONS:

1. Reduce THERMAL POWER at least 1% for each 1% F_Q exceeds the limit within 15 minutes and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours; POWER OPERATION may proceed for up to a total of 72 hours; subsequent POWER OPERATION may proceed provided the Overpower ΔT Trip Setpoints have been reduced at least 1% for each 1% F_Q exceeds the limit. The Overpower ΔT Trip Setpoint reduction shall be performed with the reactor subcritical.

2. Reduce THERMAL POWER as necessary to meet the limits of Specification 3.2.6 using the APDMS with the latest incore map and updated $\bar{R}$.

b. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; THERMAL POWER may then be increased provided F_Q is demonstrated through incore mapping to be within its limit.

SURVEILLANCE REQUIREMENTS

4.2.2.1 The provisions of Specification 4.0.4 are not applicable.

4.2.2.2 $F_Q(Z,\ell)$ shall be determined to be within its limit by:

a. Using the movable incore detectors to obtain a power distribution map at any THERMAL POWER greater than 5% of RATED THERMAL POWER.

b. Increasing the measured $F_Q(Z,\ell)$ component of the power distribution map by 3% to account for manufacturing tolerances and further increasing the value by 5% to account for measurement uncertainties.

c. Satisfying the following relationship at the time of the target flux determination.

$$F_Q^M(Z) \leq \frac{F_Q^L(Z)}{P \times Ep(Z)} [K(Z)]/[V(Z)] \qquad \text{for } P > .5$$

$$F_Q^M(Z) \leq \frac{2F_Q^L(Z)}{Ep(Z)} [K(Z)]/[V(Z)] \qquad \text{for } P \leq .5$$

where: $F_Q^M(Z) = F_Q(Z,\ell)$ at ℓ for which $\frac{F_Q(Z,\ell)}{T(E)}$ is a maximum

$F_Q^L(Z) = F_Q^L(E_\ell)$ at ℓ for which $\frac{F_Q(Z,\ell)}{T(E)}$ is a maximum

$F_Q^M(Z)$ and $F_Q^L(Z)$ are functions of core height, Z, and correspond at each Z to the rod ℓ for which $\frac{F_Q(Z,\ell)}{T(E)}$ is a maximum at that Z.

V(Z) is the function defined in Figure 3.2-3, K(Z) is defined in Figure 3.2-2, T(E) is defined in Figures 3.2-3a and 3.2-3b, P is the fraction of RATED THERMAL POWER. Ep(Z) is an uncertainty factor to account for the reduction in the $F_Q^L(E\ell)$ curve due to an accumulation of exposure prior to the next flux map.

$$Ep(Z) = 1.00 \text{ for } T(E) = 1.0 \text{ or } T(E) = .846$$

$$Ep(Z) = 1 + [.014 \times F_Q^M(Z)] \text{ for } 1.0 > T(E) > .846$$

d. Measuring $F_Q(Z,\ell)$ in conjunction with a target flux difference determination, according to the following schedule:

1. Upon achieving equilibrium conditions after exceeding by 10% or more of RATED THERMAL POWER, the THERMAL POWER at which $F_Q(Z)$ was last determined*, or

2. At least once per 31 effective full power days, whichever occurs first.

*During power escalation at the beginning of each cycle, the design target may be used until a power level for e extended operation has been achieved.

e. With successive measurements indicating an increase in peak pin power, $F_{\Delta H}$, with exposure, either of the following additional actions shall be taken.

1. $F^M_Q(Z)$ shall be increased by 2% over that specified in 4.2.2.2.c, or

2. $F^M_Q(Z)$ shall be measured and a target axial flux difference reestablished at least once per 7 effective full power days until 2 successive maps indicate that the peak pin power, $F_{\Delta H}$, is not increasing.

f. With the relationship specified in 4.2.2.2.c not being satisfied either of the following actions shall be taken:

1. Place the core in an equilibrium condition where the limit in 4.2.2.2c is satisfied and remeasure the target axial flux difference.

2. Comply with the requirements of Specification 3.2.2 for $F_Q(Z,\ell)$ exceeding its limit by the percent calculated with the following expression.

$$\left[\left[\text{max. over Z of } \frac{F^M_Q(Z) \times V(Z) \times Ep(Z)}{\frac{F^L_Q(E_\ell)}{P} \times [K(Z)]}\right] - 1\right] \times 100\ P \geq .5$$

g. The limits specified in 4.2.2.2C and 4.2.2.2f above are not applicable in the following core plane regions:

1. Lower core region 0 to 10% inclusive.

2. Upper core region 90% to 100% inclusive.

4.2.2.3 When $F_Q(Z,\ell)$ is measured for reasons other than meeting the requirements of Specification 4.2.2.2, an overall measured $F_Q(Z, \ell)$ shall be obtained from a power distribution map and increased by 3% to account for manufacturing tolerances and further increased by 5% to account for measurement uncertainty.

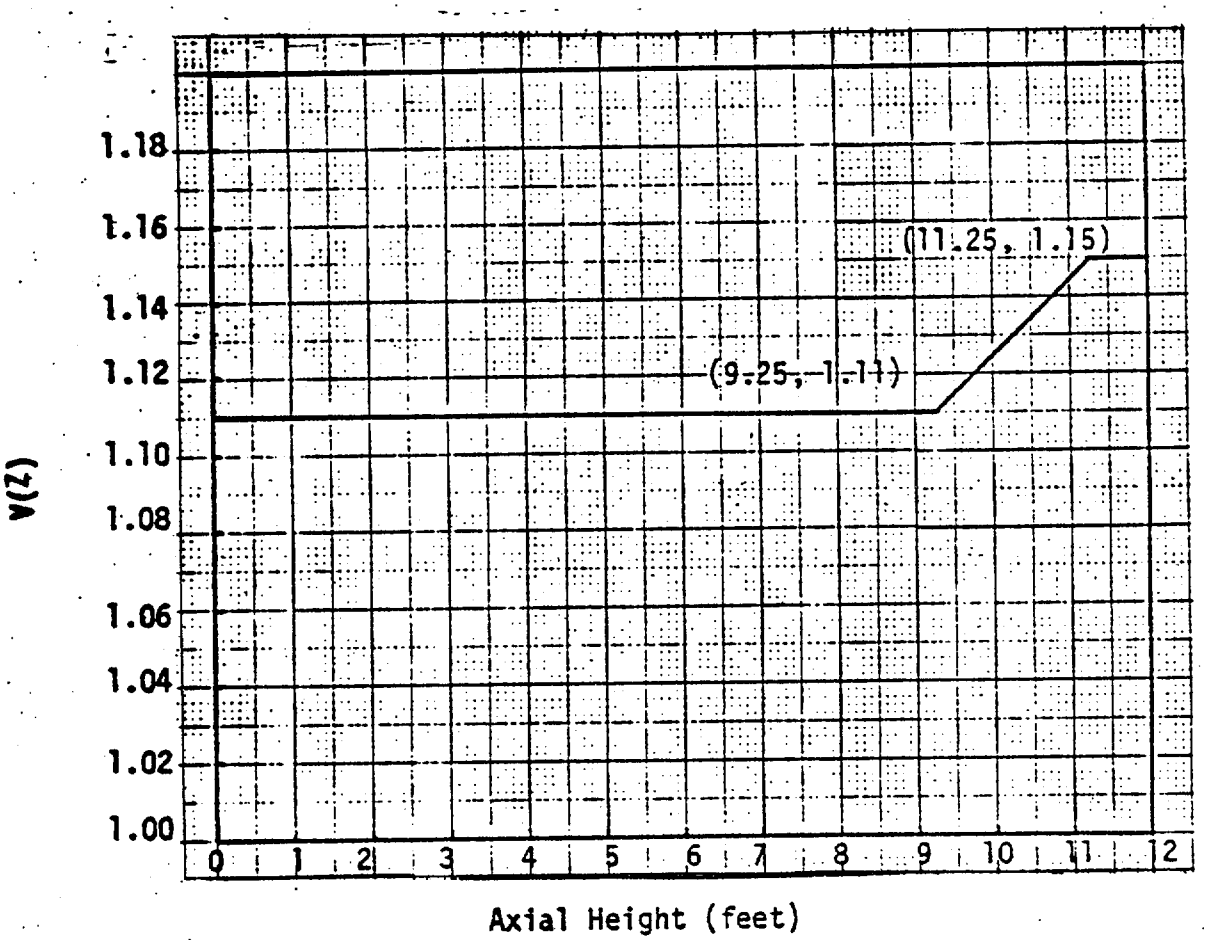

Figure 3.2-3 V(Z) As A Function Of Core Height

LIMITING CONDITION FOR OPERATION

3.2.6 The axial power distribution shall be limited by the following relationship:

$$[F_j(Z)]_S = \frac{[1.95]\,[K(Z)]}{(\overline{R}_j)(P_L)(1.03)(1 + \sigma_j)(1.07)\,F_p}$$

Where:

a. $F_j(Z)$ is the normalized axial power distribution from thimble j at core elevation Z.

b. P_L is the fraction of RATED THERMAL POWER.

c. K(Z) is the function obtained from Figure 3.2-2 for a given core height location.

d. $\overline{R}_j$, for thimble j, is determined from at least n=6 in-core flux maps covering the full configuration of permissible rod patterns at 100% or APL (whichever is less) of RATED THERMAL POWER in accordance with:

$$\overline{R}_j = \frac{1}{n} \sum_{i=1}^{n} R_{ij}$$

Where:

$$R_{ij} = \frac{F_{Qi\ell}^{Meas} / T(E)}{[F_{ij}(Z)]_{Max}}$$

R_{ij} and its associated σ_j may be calculated on a full core or a limiting fuel batch basis as defined on page B3/4 3-3 of basis.

e. $F_{Qi\ell}^{Meas}$ is the limiting total peaking factor in flux map i. The limiting total peaking factor is that factor with least margin to the $F_Q^L(E)$ curve defined in Figure 3.2-3a for Exxon Nuclear Company fuel and in Figure 3.2-3b for Westinghouse fuel.

LIMITING CONDITION FOR OPERATION (Continued)

T(E) is the ratio of the exposure dependent $F_Q^L(E)$ to 1.95 and is defined in Figure 3.2-3a for fuel supplied by Exxon Nuclear Company and in Figure 3.2-3b for fuel supplied by Westinghouse Electric Corporation.

f. $[F_{ij}(Z)]_{Max}$ is the maximum value of the normalized axial distribution at elevation Z from thimble j in map i which had a limiting total measured peaking factor without uncertainties or densification allowance of $F_{Qi\ell}^{Meas}$.

σ_j is the standard deviation associated with thimble j, expressed as a fraction or percentage of $\bar{R}_j$, and is derived from n flux maps from the relationship below, or 0.02, (2%) whichever is greater.

$$\sigma_j = \frac{\left[\frac{1}{n-1}\sum_{i=1}^{n}(\bar{R}_j - R_{ij})^2\right]^{1/2}}{\bar{R}_j}$$

The factor 1.07 is comprised of 1.02 and 1.05 to account for the axial power distribution instrumentation accuracy and the measurement uncertainty associated with F_Q using the movable detector system respectively.

The factor 1.03 is the engineering uncertainty factor.

g. F_p is an uncertainty factor for Exxon fuel to account for the reduction in the $F_Q^L(E)$ curve due to an accumulation of exposure prior to the next flux map. This correction is only required when T(E) for the limiting fuel segment is less than 1.0. The following F_p factor shall apply:

$F_p = 1.0$	for T(E) = 1.0
$F_p = 1.0 + 0.005 \times W$	for T(E) < 1.0 where W is the number of effective full power weeks (rounded up to the next highest integer) since the last full core flux map.

LIMITING CONDITION FOR OPERATION (Continued)

APPLICABILITY: Mode 1 above the percent of RATED THERMAL POWER indicated by the relationship.#

$$APL = \min \text{ over } Z \text{ of } \frac{\frac{F_Q^L(E_\ell)}{P} K(Z)}{F_Q(Z,\ell) \times V(Z) \times Ep\ (Z)} \times 100\% \qquad P > .5$$

where $F_Q(Z),\ell)$ is the measured $F_Q(Z,\ell)$, including a 3% manufacturing tolerance uncertainty and a 5% measurement uncertainty, at the time of target flux determination from a power distribution map using the movable incore detectors.

ACTION:

a. With a $F_j(Z)$ factor exceeding $[F_j(Z)]_S$ by $\leq$ 4 percent, reduce THERMAL POWER 1 percent for every percent by which the $F_j(Z)$ factor exceeds its limit within 15 minutes and within the next 2 hours either reduce the $F_j(Z)$ factor to within its limit or reduce THERMAL POWER to APL or less of RATED THERMAL POWER.

b. With a $F_J(Z)$ factor exceeding $[F_j(Z)]_S$ by > 4 percent, reduce THERMAL POWER to APL or less of RATED THERMAL POWER within 15 minutes.

The APDMS may be out of service: 1) when incore maps are being taken as part of the Augmented Startup Test Program or 2) when surveillance for determining power distribution maps is being performed.

SURVEILLANCE REQUIREMENTS

4.2.6.1 $F_j(Z)$ shall be determined to be within its limit by:

a. Either using the APDMS to monitor the thimbles required per Specification 3.3.3.6 at the following frequencies.

1. At least once per 8 hours, and

2. Immediately and at intervals of 10, 30, 60, 90, 120, 240 and 480 minutes following:

a) Increasing the THERMAL POWER above APL of RATED THERMAL POWER, or

b) Movement of control bank "D" more than an accumulated total of 5 steps in any one direction.

b. Or using the movable incore detectors at the following frequencies when the APDMS is inoperable:

1. At least once per 8 hours, and

2. At intervals of 30, 60, 90, 120, 240 and 480 minutes following:

a) Increasing the THERMAL POWER above APL of RATED THERMAL POWER, or

b) Movement of control bank "D" more than an accumulated total of 5 steps in any one direction.

4.2.6.2 When the movable incore detectors are used to monitor $F_j(Z)$, at least 2 thimbles shall be monitored and an $F_j(Z)$ accuracy equivalent to that obtained from the APDMS shall be maintained.

BASES

Although it is intended that the plant will be operated with the AXIAL FLUX DIFFERENCE within the ± 5% target band about the target flux difference, during rapid plant THERMAL POWER reductions, control rod motion will cause the AFD to deviate outside of the target band at reduced THERMAL POWER levels. This deviation will not affect the xenon redistribution sufficiently to change the envelope of peaking factors which may be reached on a subsequent return to RATED THERMAL POWER (with the AFD within the target band) provided the time duration of the deviation is limited. Accordingly, a 1 hour penalty deviation limit cumulative during the previous 24 hours is provided for operation outside of the target band but within the limits of Figure 3.2-1 while at THERMAL POWER levels above 50% of RATED THERMAL POWER. For THERMAL POWER levels below 50% of RATED THERMAL POWER, deviations the AFD outside of the target band are less significant. The penalty of 2 hours actual time reflects this reduced significance.

Provisions for monitoring the AFD on an automatic basis are derived from the plant process computer through the AFD Monitor Alarm. The computer determines the one minute average of each of the OPERABLE excore detector outputs and provides an alarm message if the AFD for at least 2 of 4 or 2 of 3 OPERABLE excore channels are outside the target band and the THERMAL POWER is greater than 90% or 0.9 x APL of RATED THERMAL POWER (whichever is less). During operation at THERMAL POWER levels between 15% and 90% or 0.9 x APL of RATED THERMAL POWER (whichever is less), the computer outputs an alarm message when the penalty deviation accumulates beyond the limits of 1 hour and 2 hours, respectively.

The upper bound limit (90% or 0.9 x APL of RATED THERMAL POWER (whichever is less)) on AXIAL FLUX DIFFERENCE assures that the $F_Q(Z,\ell)$ envelope of 1.95 times K(Z) x T(E) is not exceeded during either normal operation or in the event of xenon redistribution following power changes. The lower bound limit (50% of RATED THERMAL POWER) is based on the fact that at THERMAL POWER levels below 50% of RATED THERMAL POWER, the average linear heat generation rate is half of its nominal operating value and below that value, perturbations in localized flux distributions cannot affect the results of ECCS or DNBR analyses in a manner which would adversely affect the health and safety of the public.

Figure B 3/4 2-1 shows a typical monthly target band near the beginning of core life.

The bases and methodology for establishing these limits is presented in topical report XN-NF-77-57. "Exxon Nuclear Power Distribution Control for PWR's-Phase II" and Supplement 1 to that report.

3/4.2.5 DNB PARAMETERS

The limits on the DNB related parameters assure that each of the parameters are maintained within the normal steady state envelope of operation assumed in the transient and accident analyses. The limits are consistent with the initial FSAR assumptions and have been analytically demonstrated adequate to maintain a minimum DNBR of 1.30 throughout each analyzed transient.

The 12 hour periodic surveillance of these parameters thru instrument readout is sufficient to ensure that the parameters are restored within their limits following load changes and other expected transient operation. The 18 month periodic measurement of the RCS total flow rate is adequate to detect flow degradation and ensure correlation of the flow indication channels with measured flow such that the indicated percent flow will provide sufficient verification of flow rate on a 12 hour basis.

3/4.2.6 AXIAL POWER DISTRIBUTION

The limit on axial power distribution ensures that F_Q will be controlled and monitored on a more exact basis through use of the APDMS when operating above APL of RATED THERMAL POWER. This additional limitation on F_Q is necessary in order to provide assurance that peak clad temperatures will remain below the ECCS acceptance criteria limit of 2200°F in the event of a LOCA.

The unit may operate with fuel assemblies supplied by the Exxon Nuclear Company and by Westinghouse Electric Corporation. An F_Q limit has been specified for each of these two fuel types.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 38 TO FACILITY OPERATING LICENSE NO. DPR-58

INDIANA AND MICHIGAN ELECTRIC COMPANY

DONALD C. COOK NUCLEAR PLANT UNIT NO. 1

DOCKET NO. 50-315

Background

In a letter dated May 12, 1980, Indiana and Michigan Electric Company proposed revisions to the D. C. Cook Unit 1 Technical Specifications which will allow operation with Exxon Nuclear Company (ENC) Power Distribution Control Phase II (PDC-II) procedures. The revisions are based on ENC Topical Reports XN-NF-77-57[1] and XN-NF-77-57, Supplement 1[2].

Evaluation

Our review of the Exxon PDC-II topical report and its supplement has been completed. A topical report review is being prepared and will be issued shortly. Our finding is that PDC-II is an acceptable methodology for use in ensuring that the core total peaking factor, F_Q, will not in normal operation exceed the axially-dependent limits assumed as input for the loss-of-coolant accident. We have reached this conclusion based upon our evaluation of the analyses reported in the topical reports and upon independent verification of some of the calculational results by our technical assistance consultants at Brookhaven National Laboratories[3]. We also have earlier[4] aproved PDC-II for use in Prairie Island Units 1 and 2, based on the status of our review at that time.

Basically, PDC-II uses the same procedures and Technical Specifications used for power distribution control in Westinghouse reactors for a number of years. These show analytically, assuming the procedures are followed, that a maximum F_Q is not exceeded in normal operation of the power plant. The salient procedure is that the axial flux difference measured by excore flux detectors is maintained within $\pm 5\%$ of the unrodded full power value. This prevents the formation of axial xenon maldistributions and subsequent occurrence of xenon oscillations, which can cause larger values of F_Q. Typically, this methodology shows that F_Q will not exceed 2.32 times any axial shaping factors that may apply. If a lower F_Q limit is imposed (because of the LOCA surveillance of F_Q is initiated using the movable incore detectors at power levels above that which is the ratio of the F_Q limit to that justified by the analysis using excore detectors.

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PDC-II separates F_Q into transient and steady-state components. By analyses Exxon has developed a curve V(Z) which bounds the transient component as a function of axial height, Z, for a variety of maneuvers more limiting than expected in normal operation of a reactor. By then using measured steady-state value of $F_Q(Z)$ multiplied by the V(Z) curve, the F_Q which will not be exceeded is determined and compared to the limit. If the ratio of these numbers is less than one at any elevation, this determines the fraction of power at which incore surveillance of F_Q must be initiated. If the ratio is one or greater, full power operation is permitted.

The proposed Technical Specification changes implement PDC-II and are acceptable because they will continue to ensure that the core peaking factor will not exceed the axially-dependent limits used as input for the LOCA analysis in normal operation of the power plant.

Environmental Consideration

We have determined that the 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 consequences of accidents previously considered and do 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 this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: July 25, 1980

REFERENCES

1. XN-NF-77-57, Exxon Nuclear Company, "Exxon Nuclear Power Distribution Control for Pressurized Water Reactors, Phase 2," January 1978.

2. XN-NF-77-57, Supplement 1, Exxon Nuclear Company, "Exxon Nuclear Power Distribution Control for Pressurized Water Reactors, Phase II," June 1979.

3. Mike Todosow, et al., Brookhaven National Laboratory, "Axial Power Distribution Control Strategies for PWRs." (In publication)

4. U. S. Nuclear Regulatory Commission, "Amendment Nos. 35 and 29 to Facility Operating License Nos. DPR-42 and DPR-60 for the Prairie Island Nuclear Generating Plant, Unit Nos. 1 and 2, Respectively," April 20, 1979.

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-315

INDIANA AND MICHIGAN ELECTRIC COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 38 to Facility Operating License No. DPR-58, issued to Indiana and Michigan Electric Company (the licensee), which revised Technical Specifications for operation of Donald C. Cook Nuclear Plant, Unit No. 1 (the facility) located in Berrien County, Michigan. The amendment is effective as of the date of issuance.

The amendment revises the Unit 1 Technical Specifications to allow operation of the Unit with Exxon Nuclear Company (ENC) power distribution control procedures.

The application for the amendment 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 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 or negative declaration and 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 application for amendment dated May 12, 1980, (2) Amendment No. 38 to License Nos. 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 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 25th day of July, 1980.

FOR THE NUCLEAR REGULATORY COMMISSION

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