INDIANA & MICHIGAN POWER COMPANY
P. O. BOX 18
BOWLING GREEN STATION
NEW YORK, N. Y. 10004

April 23, 1979
AEP:NRC:00161

Donald C. Cook Nuclear Plant Unit No. 1
Docket No. 50-315
License No.: DPR-58

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

Attachment 1 to this letter contains a proposed Technical Specification change for Unit 1 of the Donald C. Cook Nuclear Plant. We are requesting the upper bound of the Moderator Temperature Coefficient (MTC) given in Specification 3.1.1.4a be changed from 0×10^{-4} $\Delta k/k/^{o}F$ to $+0.5 \times 10^{-4}$ $\Delta k/k/^{o}F$. This change would significantly enhance plant operational flexibility during power ascension maneuvers early in each cycle (during the first 1500 MWD/MTU). In fact, without this change, beginning of cycle power ascension would be considerably more difficult.

A plant transient analysis applicable to the Donald C. Cook Unit 1 was performed by Exxon Nuclear Company to assess the impact of the change. The evaluation model employed was consistent with previously submitted and approved methods as detailed in Exxon Report XN-76-35. The results contained in the report are used as base case data in assessing the proposed change. It may be noted that conservative multipliers (1.2 and 0.8) were applied to the reactivity coefficients in a fashion consistent with XN-76-35. An additional conservatism was employed in that full power transients were analyzed using a predicted hot zero power value of the MTC.

The transients identified for analysis were:

(1) Loss of load at beginning of cycle (BOC),

(2) Locked rotor at BOC,

(3) Loss of reactor coolant flow at BOC,

(4) Fast and slow uncontrolled rod withdrawals at BOC.

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Attachment 2 to this letter contains five tables which list the bounding neutronic parameters, initial conditions, and transient results. Tables 3 and 4 summarize the analysis results. The principal effect of the proposed change is to slightly reduce the thermal margin for non-rod withdrawal events. The loss of reactor flow event was not explicitly analyzed since the locked rotor results bound this type of transient. In rod withdrawal events, although the positive MTC contributes to increased power, sufficient moderator and fuel thermal lag exists such that the clad heat flux is not significantly increased before reactor scram. The margin reductions themselves are small as is exemplified in Table 5. The MDNBR for the most limiting transient (locked rotor) remains substantially greater than the plant technical specification basic limit (1.79 vs. 1.30).

Thus, all criteria of the previous plant transient analysis(XN-76-35) are met and the proposed change does not impact on the aforementioned safety criteria limits. This Technical Specification change has been reviewed by both the PNSRC and the required membership of the AEPSC NSDRC in accordance with the appropriate provisions of our Technical Specifications. The result of this review indicates that the subject Techncial Specification change will not adversely affect the health and safety of the public.

Your urgent attention to this matter is kindly requested.

This Technical Specification change deals with a single safety issue which does not involve a significant hazard issue. Therefore, pursuant to 170.22 of 10 CFR 170, a check (dated April 18, 1979, No. 200421) in an amount of $4,000.00 has been forwarded under a separate cover.

Very truly yours,

G. P. Maloney
Vice President

GPM:em

Sworn and subscribed to before me
this 23rd day of April, 1979 in
New York County, New York

Kathleen Barry
Notary Public

KATHLEEN BARRY
NOTARY PUBLIC, State of New York
No. 41-4665792
Qualified in Queens County
Certificate filed in New York County
Commission expires March 30, 1981

cc:(Attached)

cc: R. C. Callen
P. W. Steketee
G. Charnoff
R. Walsh
R. J. Vollen
R. W. Jurgensen
D. V. Shaller-Bridgman

ATTACHMENT 1
PROPOSED TECHNICAL SPECIFICATION CHANGE
AEP:NRC:00161
DONALD C. COOK NUCLEAR PLANT UNIT 1

REACTIVITY CONTROL SYSTEMS

MODERATOR TEMPERATURE COEFFICIENT

LIMITING CONDITION FOR OPERATION

3.1.1.4 The moderator temperature coefficient (MTC) shall be:

a. $\leq +5.0 \times 10^{-5}$ $\Delta k/k/^{o}F$, and

b. Less negative than -3.5×10^{-4} $\Delta k/k/^{o}F$ 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.

ATTACHMENT 2
PLANT TRANSIENT ANALYSIS DATA AND RESULTS
AEP:NRC:00161
DONALD C. COOK NUCLEAR PLANT UNIT 1

TABLE 1

BOUNDING NEUTRONIC PARAMETERS*

Parameter	BOC	EOC	BOC**	EOC**
Moderator temperature coefficient (pcm/°F)***	+5.0	-30.0	-3.0	-30.0
Moderator density coefficient (pcm/gm/cc)	-4500.0	+27000	0.0	+500.0
Delayed neutron fraction(%)	0.61	0.51	0.61	0.51
Boron worth coefficient ($\Delta\rho$/ppm x 10^4)	-1.4	-0.85	-1.4	-0.8
Total rod worth (%)	-3.40	-5.15	-3.40	-5.15
Doppler coefficient ($\Delta\rho$/°F x 10^5)	-1.1	-1.6	-1.1	-1.6

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* design conservative multipliers were applied in actual analyses

** XN-76-35 analysis values

*** pcm = $10^{-5}\Delta\rho$

TABLE 2

SUMMARY OF DESIGN INITIAL CONDITIONS**

Parameter	Loss of Load	Locked Rotor
Core Power (MWt)	3315*	3315*
Core inlet temperature (^{o}F)	540.5*	540.5*
Primary pressurizer pressure (psia)	2220*	2220*
Primary flow rate (lbm/hr)	135.6×10^{6}*	135.6×10^{6}*
Steam generator dome pressure (psia)	760	760
Total steam flow rate (lb m/hr)	14.4×10^{6}	14.4×10^{6}
Feedwater enthalphy (BTU/lb m)	413.8	413.8
F_Z	1.51	1.51
F_Q	2.36	2.36
$F_{\Delta h}$	1.60	1.60
Active/Total core flow	0.955	0.955
% Heat Generated in Fuel	97.5	97.5

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* Nominal $\pm$ uncertainties

** No change from XN-76-35

TABLE 3

TRANSIENT RESULTS

Variable	Loss of Load	Locked Rotor
Peak core power (MWT)	3680	3471
Peak primary pressure (psia)	2571	2252
Maximum primary/secondary Δp(psi)	1495	1471
Maximum coolant flow rate (lbm/hr)	133.7×10^6	102.6×10^6
MDNBR (XN-76-35 w/o rod bow)	2.43	1.98
MDNBR (w/o rod bow)	2.31	1.85
MDNBR (w rod bow)	2.14	1.79

TABLE 4

SUMMARY OF ROD WITHDRAWAL RESULTS

Reactivity Insertion	Maximum Core Power		MDNBR	
$\Delta\rho$ /sec	MW(t) XN-76-35	Current Analysis	XN-76-35	Current Analysis
8×10^{-4}	4230	4255	2.24	2.24
2×10^{-5}	3633	3656	2.15	2.15

TABLE 5

Changes in MDNBR As A Function Of MTC

	Moderator Coefficient (pcm/°F)		Δ MDNBR*
	-3.0	+5.0	
Locked Rotor MDNBR	1.98	1.85	0.13
Loss of Load,MDNBR	2.43	2.31	0.12

* ΔMDNBR = Reduction in MDNBR due to positive MTC