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February 15, 1980
IPN-80-17

Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. Albert Schwencer, Chief
Operating Reactors Branch No. 1
Division of Operating Reactors

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Interim Actions

References: (1) Letter from Mr. G. T. Berry to Mr. H. R. Denton (IPN-80-12), dated February 1, 1980
(2) Letter from Mr. P. J. Early to Mr. A. Schwencer (IPN-80-9), dated January 29, 1980

Dear Sir:

In Attachment A to Reference (1) on Page 1, Item 1, the Authority committed to maintain reactor power level as necessary such that the calculated fuel peak clad temperature (PCT) would not exceed 2000°F under large break LOCA conditions.

The Authority requested the Westinghouse Electric Corporation to perform a study to determine the reduction in total allowed peaking factor (F_Q) to attain the necessary reduction in PCT to satisfy the above commitment.

As a base, Westinghouse utilized the results from the recently completed ECCS reanalysis with a 4% steam generator tube plugging level (Reference 2). This reanalysis supported the current Technical Specification value of 2.17 for F_Q. The corresponding PCT calculated for the most limiting large break LOCA was 2094°F. The attached study based on Reference 2 indicates that a reduction in F_Q of about 0.04 would result in a PCT less than 2000°F during the most limiting large break LOCA. Therefore, the allowed F_Q for Cycle 3 operations will be 2.13.

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The Authority will administratively restrict the total allowable peaking factor limit to an F_Q of 2.13 during Cycle 3 operations. Previous reactor core physics and transient analyses have demonstrated that the highest peaking factor which could occur during Cycle 3 operations will be less than 2.13; therefore, no reduction in power will be necessary.

This study has been reviewed by the Authority's Plant Operating Review Committee and Safety Review Committee. The Safety Committees have determined that this result (a) does not increase the probability nor the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the Safety Analysis Report; (b) does not increase the probability for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report; (c) does not reduce the margin of safety as defined in the basis for any Technical Specification; and (d) does not constitute an unreviewed safety question pursuant to 10 CFR §50.59.

Very truly yours,

George M. Wilverding

for Paul J. Early
Assistant Chief Engineer-Projects

cc: Mr. T. Rebelowski
Resident Inspector
U. S. Nuclear Regulatory Commission
P. O. Box 38
Buchanan, New York 10511

ATTACHMENT

Indian Point Unit 3 Response to Item 1, Page 1
Interim Actions-Issued by the
Power Authority on February 1, 1980

The large break LOCA analysis results for Indian Point Unit 3 have been evaluated to establish an estimated peaking factor (F_Q) limit adjustment required to restrict the peak clad temperature to a maximum value of 2000°F (rather than the 10CFR50 limit of 2200°F).

The most recent break spectrum analysis for Indian Point Unit 3 was performed assuming a 4 percent steam generator tube plugging (SGTP) level. This is an appropriate analysis to use as a basis since the current SGTP level is less than 4%.

The following table shows the maximum temperatures calculated for the burst node and reflood node for each break analyzed.

Break C_D	1.0	0.8	0.6
F_Q=2.17			
Burst Node			
Elevation (ft)	6.25	6.25	6.0
PCT (°F)	2094.1	2026.5	2023.3
Reflood Node			
Elevation (ft)	7.25	7.25	7.25
PCT (°F)	2003.9	1999.6	2009.4

The F_Q adjustment required to maintain a PCT of 2000°F can be estimated by evaluating the maximum burst node temperature (break C_D=1.0) and the maximum reflood node temperature (break C_D=0.6) from the spectrum of breaks analyzed. Note that there is a large difference between the peak temperature calculated for the spectrum of breaks, thus the maximum temperature case will be used to determine the F_Q adjustment to reduce the PCT in all cases to a value below 2000°F.

1) For the reflood node, an appropriate sensitivity is that a 0.01 reduction in F_Q reduces PCT by 10°F. Therefore, an F_Q reduction of .01 would limit the reflood node to less than 2000°F.

2) The impact of changing F_Q for the burst node is shown on Figure 1. The $\Delta PCT/0.01\Delta F_Q$ sensitivity between the PCT values of 2094°F and 2000°F is nearly linear and a reasonable (and conservative) value to use would be the mid point of that range. At 2047°F $\Delta PCT/0.01\Delta F_Q$ = 28°F. Therefore, an F_Q reduction of: $\left(\frac{2094-2000}{28}\right)$ (0.01) = 0.034

would limit the burst node to 2000°F.

Potential penalties associated with the use of NRC fuel rod models proposed in draft NUREG 0630 have previously been assessed for this plant. That assessment led to the conclusion that those potential penalties are offset by Westinghouse evaluation model improvements currently being reviewed and are not considered further here.

Therefore, the F_Q value required to maintain a PCT below 2000°F for the limiting case is approximately 2.17 - 0.04 = 2.13.

FIGURE 1

Increase in the burst node clad temperature for 0.01 increase in peaking factor for the reference burst node temperature indicated