ATTACHMENT I

Proposed Technical Specifications Changes

New York Power Authority
Indian Point 3 Nuclear Power Plant
Docket No. 50-286

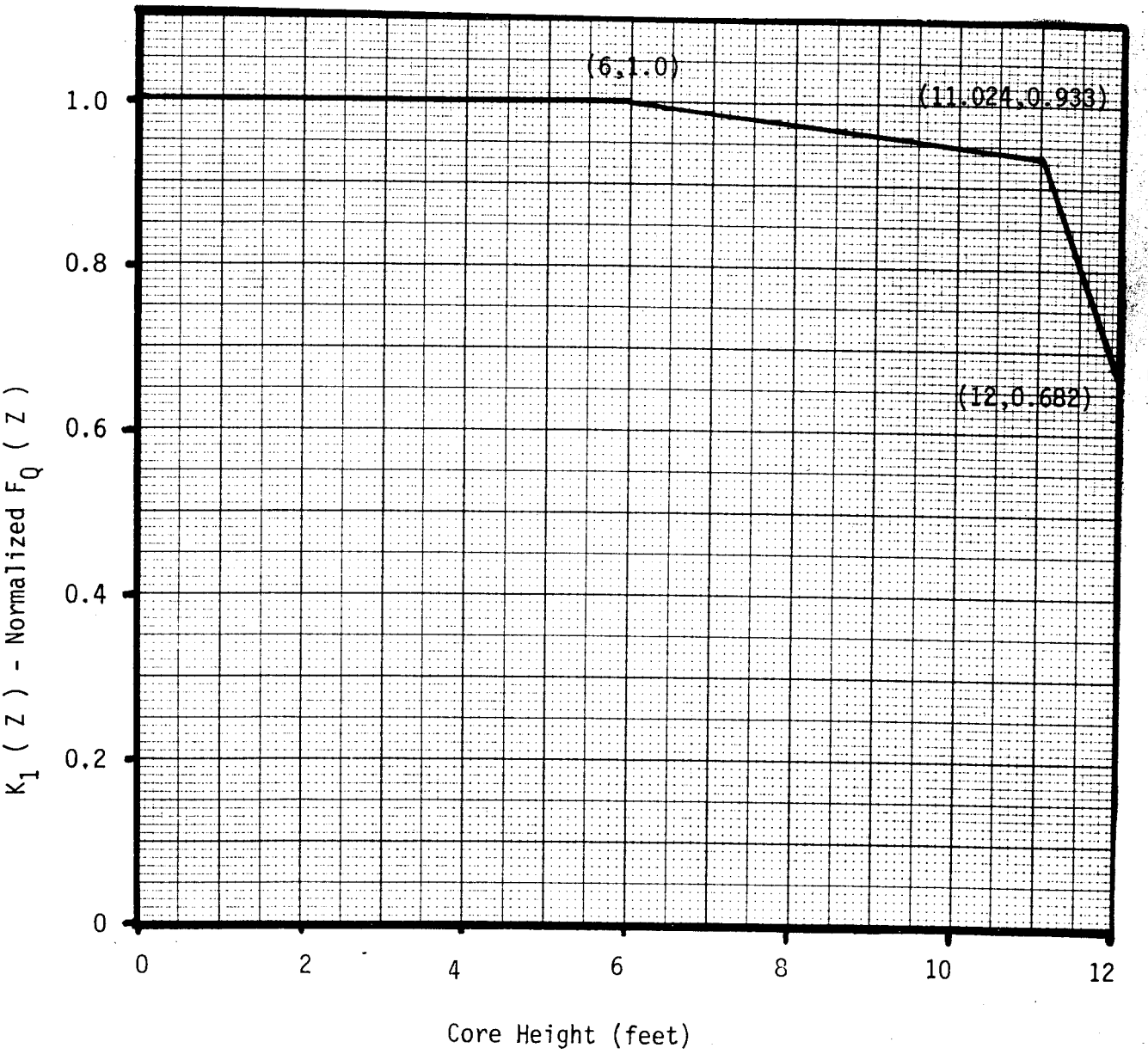

Figure 3.10-2 Hot Channel Factor Normalized Operating Envelope

ATTACHMENT II

Safety Evaluation of Proposed
Technical Specifications

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Attachment II
Safety Evaluation of Proposed
Technical Specifications

I. Description of Change

Reference 1 transmitted proposed revisions to the Indian Point 3 Technical Specifications seeking to increase the maximum allowable total core peaking factor, F_Q. Presently, the Technical Specifications limit the full power F_Q to less than or equal to 2.13. The change will increase the full power F_Q limit to less than or equal to 2.20.

This application supplements the proposed Technical Specifications revision transmitted by Reference 1 by revising Figure 3.10-2 to reflect the proposed F_Q limit of 2.20. Figure 3.10-2 provides the normalized K(z) values as a function of core height. The K(z) curve is generated by normalizing the $F_Q(z)$ curve to the maximum F_Q value.

As can be seen in Figure 1, the $F_Q(z)$ curve consists of three line segments. The first line segment of the F_Q (z) curve (bottom 6 feet of the core) is determined by the maximum large break LOCA peaking factor which corresponds to the peak local power of the chopped cosine power shape, and is of constant value through the bottom half of the core. The second line segment is dictated by both the large and small break LOCA analyses. The third line segment is based on the limiting small break LOCA power shape. Both the $F_Q(z)$ endpoint and the slope of the third line segment are dictated by this shape. As this power shape has not changed, the slope of the third line segment and the $F_Q(z)$ endpoint have remained constant.

Historically, $F_Q(z)$ curves were predicated on the long established maximum F_Q of 2.32. The limiting power shape for the small break LOCA was determined to have a maximum F_Q of less than 2.32 at an elevation greater than 6 feet but peaking at an elevation which lies below the third line segment. The limiting small break LOCA power shape peak F_Q point and the large break LOCA F_Q at the 6 foot elevation represent the two points which define the second line segment when based on a F_Q of 2.32.

When the maximum F_Q is less than 2.32, the first line segment of the $F_Q(z)$ curve is lowered to the appropriate level commensurate with the large LOCA analysis. As shown in Figure 1 for the present case, the first line segment is lowered to a F_Q value of 2.20 and is of constant value through the bottom half of the core. To ensure the limitation of the small break LOCA power shape, the second line segment must begin at the end of the first line segment (6 foot) and must be parallel to the second line segment of the $F_Q(z)$ curve based on a maximum F_Q of 2.32. The endpoint of the second line segment of the 2.20 $F_Q(z)$ curve is at the point where it intersects with the third line segment of the 2.32 $F_Q(z)$ curve . For the present case, the second line segment of the 2.20 F_Q (z) curve will intersect the third line segment of the 2.32 F_Q (z) curve at the point corresponding to a core height of 11.024 feet and a $F_Q(z)$ of 2.0526. This point is also the origin of the third line segment of the 2.20 $F_Q(z)$ curve. The small break LOCA power shape dictates the endpoint of the third line segment to be at a F_Q value of 1.5.

The above describes the affect of revising the maximum F_Q limit to 2.20 on $F_Q(z)$ curve. In order to revise the K(z) curve to reflect this change in the maximum F_Q limit , the revised F_Q (z) curve must be normalized to a maximum F_Q limit of 2.20. As shown in Figure 2, the first line segment of the revised K(z) curve will have a constant value of 1 through the bottom half of the core. The origin of the second line segment of revised K(z) curve is at the point which corresponds to a core height of 6 feet and a K(z) of 1. The endpoint of this second line segment is that point corresponding to a core height of 11.024 feet and a K(z) value of 0.933. The K(z) value of 0.933 is the normalization of the F_Q value of 2.0526 to a maximum F_q of 2.20 (2.0526/2.20 = 0.933). The origin of the third line segment is the aforementioned point corresponding to a core height of 11.024 feet and a K(z) valve of 0.933. The endpoint of the third line segment is that point corresponding to a core height of 12 feet and a K(z) value of 0.682. The K(z) value of 0.682 is the normalization of the F_Q value of 1.5 to a maximum F_Q of 2.20 (1.5/2.20 = 0.682).

II. EVALUATION OF CHANGE

The February 11, 1980 Confirmatory Order had limited the calculated fuel peak clad temperature (PCT) to a maximum of 2000°F under large break LOCA conditons. As a result of this limit, a substantial penalty on F_Q had to be imposed.

Enclosure 1 to the Safety Evaluation transmitted by Reference 1 provides the Appendix K Emergency Core Cooling System (ECCS) reanalysis assuming a uniform 24% steam generator tube plugging level, which was transmitted to the NRC via the Authority's May 5, 1983 letter. The limiting Final Acceptance Criteria (FAC) analysis case was the Double Ended Cold Leg Guillotine (DECLG) break, C_d=0.4. For this limiting case, the PCT was calculated to be 2039°F for a full power F_Q of 2.20. This case was re-analyzed with a full power F_Q of 2.14. The resultant PCT was 1995°F and thereby assured compliance with the February 11, 1980 Order. This F_Q limit was incorporated into the Indian Point 3 Technical Specification via Amendment 48, dated January 13, 1984. By Rescission of Order, dated July 5, 1985, the February 11, 1980 Confirmatory Order was rescinded. As such, the aforementioned limiting case analysis with an F_Q of 2.20 can now be utilized as the resultant PCT of 2039°F satisfies the PCT requirement of 10 CFR 50.46.

However, the aforementioned Appendix K reanalysis, assuming a F_Q of 2.20, was performed in support of reactor operations with uniform 24% steam generator tube plugging. The Authority's March 14, 1986 letter transmitted Revision 1 to WCAP-10705, "Safety Evaluation for Indian Point 3 with Asymmetric Tube Plugging Among Steam Generators (Non-proprietary)", which documented sensitivity of asymmetric steam generator tube plugging level on the LOCA and non LOCA transients. Enclosure 2 to the Safety Evaluation transmitted by Reference 1 details the sensitivity of asymmetric tube plugging on calculated ECCS performance. The full power F_Q of 2.20 for the ECCS reanalysis performed for a uniform 24% steam generator tube plugging level is not adversely impacted by asymmetric effects.

The Authority's April 23, 1985 letter transmitted proposed revisions to the Technical Specifications in support of the Cycle 4/5 refueling, which involved a fuel design transition from the Westinghouse 15 x 15 low parasitic (LOPAR) design to the 15 x 15 Optimized Fuel Assembly (OFA) design. The greater hydraulic resistance of the 15 x 15 OFA will cause an approximate reduction of 2.2% in reflood flow rate. This will result in an approximate 10°F increase in PCT under large break LOCA conditions. As a result of this increase in PCT, the F_Q limit had to be lowered from 2.14 to 2.13 so that the Confirmatory Order requirement of 2000°F PCT would not be exceeded. These revisions were incorporated into the Indian Point 3 Technical Specifications via Amendment 61, dated August 27, 1985.

Including the 10°F increase to account for the OFA design results in a PCT of 2049°F for a F_Q of 2.20 under the LOCA conditions. The limits of 10 CFR 50.46 are not exceeded. The F_Q assumed in all of the small break LOCA and non-LOCA transient analyses was 2.32. Asymmetric steam generator tube plugging and the OFA design did not necessitate any reductions in this assumed F_Q value. Hence F_Q of 2.20 assumed in the large break LOCA is limiting.

III. No Significant Hazards Evaluation

1) Does the proposed license amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed change seeks to increase the F_Q limit to 2.20. The revised limit will not increase the probability of an accident previously analyzed as this limit is an operational restriction to limit the consequences of an accident.

The analyses results are within the safety limits provided by 10 CFR 50.46.

2) Does the proposed license amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Increasing the F_Q limit to 2.20 will not introduce the possibility of an accident of a different type than previously analyzed.

3) Does the proposed amendment involve a significant reduction in a margin of safety?

In issuing Amendement 48 to the Indian Point 3 Technical Specifications, dated January 13, 1984 the NRC in their safety evaluation report reviewed and approved the ECCS reanalysis assuming a F_Q of 2.14, which results in a PCT of 1995°F. The proposed change increasing the F_Q limit of 2.20 will result in a PCT of 2039°F. The presence of OFA fuel in the core will result in a PCT of 2049°. The analyses results are within the safety limits specified in 10 CFR 50.46.

The Authority considers that the proposed changes can be classified as not likely to involve significant hazard considerations since the proposed changes constitute "a change which may reduce in some way a safety margin, but where the results of the change are clearly within all

acceptable criteria with respect to the system or component specified in the Standard Review Plan." (Example (VI), Federal Register, Vol. 48, No. 67 dated April 6, 1983, page 148701).

IV. Impact of Change

This change will not impact the following:

- ALARA Program
- Fire Protection Program
- Emergency Plan
- FSAR or SER Conclusions
- Overall Plant Operations

V. Conclusion

This change: a) will 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) will not increase the possibility for an accident or malfunction of a different type than evaluated previously in the Safety Analysis Report; c) will not reduce the margin of safety as defined in the basis for any Technical Specification; d) does not constitute an unreviewed safety question as defined in 10 CFR 50.59; e) involves no significant hazards considerations as defined in 10 CFR 50.92.

VI. References

1. Letter to S. A. Varga from J. C. Brons, dated April 18, 1986, entitled: "Proposed Changes to the Technical Specifications Related to Total Core Peaking Factor, F_Q."

2. Letter to S. A. Varga from J. P. Bayne, dated April 23, 1985, entitled: "Proposed Technical Specifications Regarding Cycle 4/5 Refueling."

3. Letter to S. A. Varga from J. P. Bayne, daed March 27, 1985, entitled: "Asymmetric Steam Generator Tube Plugging Technical Specifications."

4. Letter to S. A. Varga from J. P. Bayne, dated May 5, 1983, entitled: "Proposed Changes to the Technical Specifications Related to Safety Limit, Reactor Core and Control Rod and Power Distribution Limits, Shutdown Reactivity."

5) WCAP - 10705 "Safety Evaluation for Indian Point 3 with Asymmetric Tube Plugging Among Steam Generators," October 1984.

6) IP-3 FSAR

7) IP-3 SER

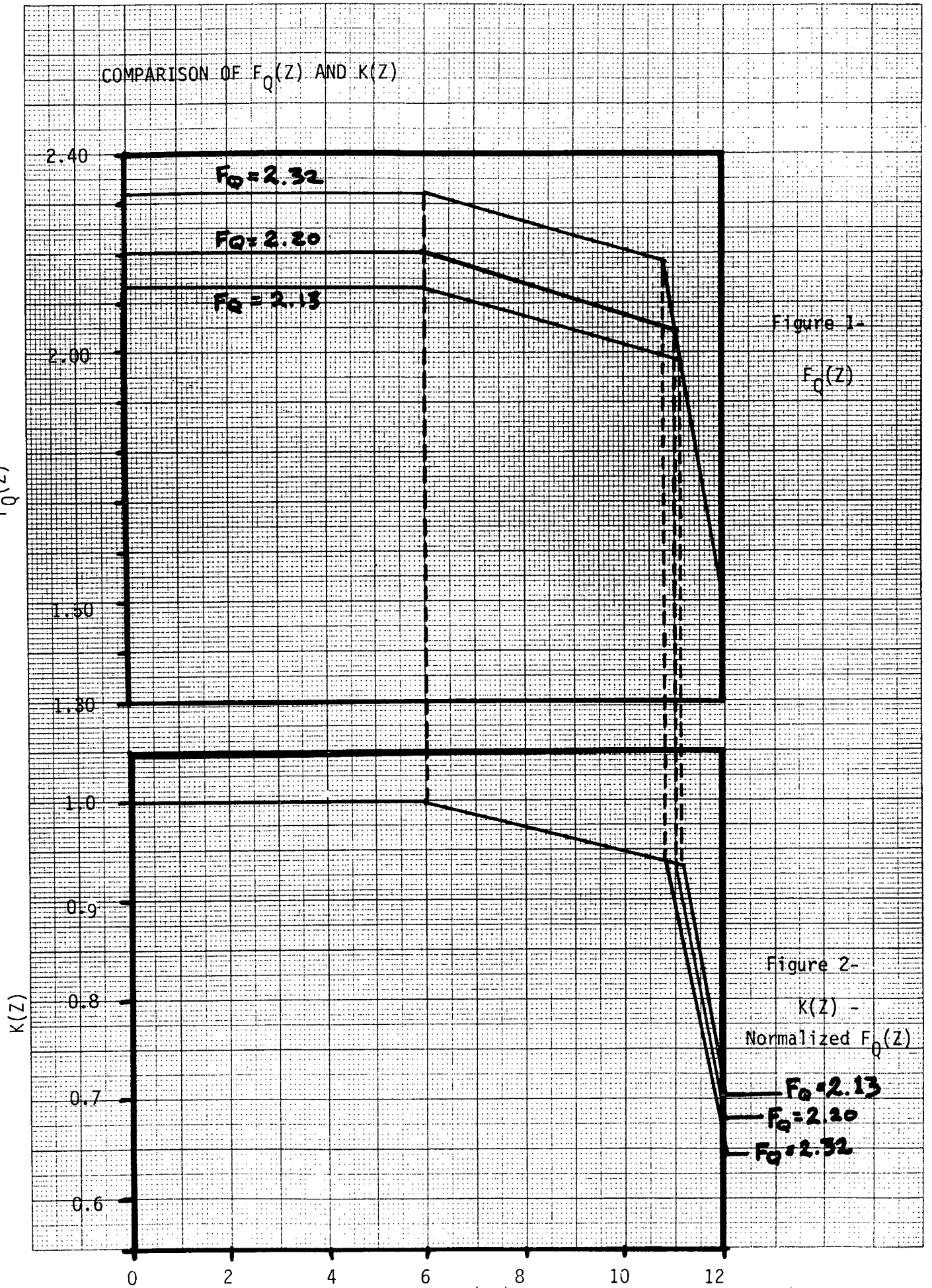

Figure 1- $F_Q(Z)$

Figure 2- K(Z) - Normalized $F_Q(Z)$

ATTACHMENT III
Documentation of Assumed F_Q Values

New York Power Authority
Indian Point 3 Nuclear Power Plant
Docket No. 50-286

Westinghouse Electric Corporation
Power Systems

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Pittsburgh Pennsylvania 15230-0355

INT-87-502
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January 9, 1987

Mr. Peter Kokolakis
Director of PWR Licensing
New York Power Authority
123 Main Street
White Plains, NY 10601

NEW YORK POWER AUTHORITY
INDIAN POINT UNIT 3
Safety Analysis Input Information

Dear Mr. Kokolakis:

The purpose of this letter is to confirm that a value for F(Q) of 2.32 was used in the non-LOCA safety analyses that were performed in order to justify steam generator tube plugging levels as high as 24%. This value was used in both the uniform and asymmetric plugging analyses. These analyses have been previously submitted to NYPA by Westinghouse and conservatively bound the Indian Point 3 core design.

If you have any questions concerning the information presented in this letter, please call A. M. Sicari at (412) 374-5585 or the undersigned.

Very truly yours,

S. P. Swigart, Project Manager
Operating Plant Projects

/lso