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September 29, 1993
IPN-93-113

U.S. Nuclear Regulatory Commission
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Washington, DC 20555

Subject: **Indian Point 3 Nuclear Power Plant**
Docket No. 50-286
Supplement to Proposed Changes to Technical
Specifications Regarding Deletion of
References to the Boron Injection Tank

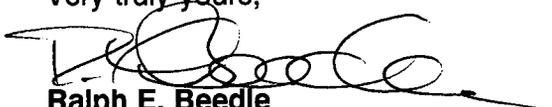
Reference: NYPA letter, R.E. Beedle to the NRC Document Control Desk, dated
May 4, 1993 (IPN-93-028), regarding boron injection tank Technical
Specification changes.

Dear Sir:

The Authority recently proposed (in the referenced letter) amending the Indian Point 3 Technical Specifications to delete all references to the boron injection tank. The Nuclear Regulatory Commission (NRC) staff reviewers of this submittal raised several questions concerning steam generator tube plugging assumptions used in the supporting analysis. The questions were discussed in telephone calls between staff members of the Authority and NRC. The attachment to this letter documents the information that the Authority provided during the telephone calls.

No commitments are being made by this submittal. If you have any questions, please contact Mr. P. Kokolakis.

Very truly yours,


Ralph E. Beedle

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cc: see next page

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Attachment I to IPN-93-113

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Supplement to Boron Injection Tank Technical Specification Changes Proposed by May 4, 1993 Letter

Background

The Authority recently proposed (in the referenced letter) amending the Indian Point 3 (IP3) Technical Specifications to delete all references to the boron injection tank (BIT). The BIT analysis, included as Attachment III of the referenced letter, stated "The BIT removal analysis assumed 24% uniform steam generator tube plugging." Nuclear Regulatory Commission (NRC) staff questions, regarding how this statement relates to the analysis of a steam pipe rupture presented in section 14.2.5 of the IP3 Final Safety Analysis Report, were discussed in telephone calls between staff members of the Authority and NRC. The telephone discussions centered on three major issues regarding the BIT analysis:

- 1) tube plugging assumed to determine flow through the reactor core,
- 2) tube plugging assumed to determine heat transfer area, and
- 3) how the assumptions made in the analysis relate to the present IP3 steam generator conditions.

A summary of the information discussed during the telephone calls is provided below.

Summary of Information Provided During Telephone Calls

As described below, the BIT analysis used two different assumptions for steam generator tube plugging in order to make the analysis conservative.

To determine flow through the reactor core, the BIT analysis assumed 24% uniform tube plugging. In analyzing core response based on the amount of flow, there are two competing effects. For a steam line break, increasing flow produces a more severe reactor coolant cooldown, but increasing the flow also increases the margin to a Departure from Nucleate Boiling (DNB) condition. Analysis has shown the margin to DNB to be the dominant factor. Therefore, the DNB analysis was performed using a conservative assumption of 24% uniform tube plugging, resulting in decreased flow and decreased margin to DNB.

To determine heat transfer area, and therefore the severity of the reactor coolant cooldown, the BIT analysis conservatively assumed 0% steam generator tube plugging. For a steam line break, a maximum heat transfer area results in the most severe cooldown. Therefore, the BIT analysis conservatively used 0% tube plugging in determining heat transfer area, to maximize the reactor coolant cooldown.

The BIT analysis was based on the original Indian Point 3 steam generators. The original steam generators were replaced in 1989. The original steam generators each had 3260 tubes, and the new steam generators each have 3214 tubes. Currently, steam generator 34 (SG 34) has two plugged tubes. Based on the reduced number of tubes, the installed steam generators are currently at an approximate 1.4% (almost 1.5% for SG 34) "equivalent tube plugging" level compared to the original steam generators.

Attachment I to IPN-93-113

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**Supplement to Boron Injection Tank Technical
Specification Changes Proposed by May 4, 1993 Letter**

Conclusion

The BIT analysis used two different assumptions for steam generator tube plugging in order to make the analysis conservative. For flow through the reactor core, 24% uniform tube plugging was assumed, resulting in lower margin to DNB than if a decreased tube plugging level was assumed. For heat transfer area, 0% tube plugging (based on 3260 tubes per generator) was assumed, resulting in a more severe reactor coolant cooldown than if an increased tube plugging level was assumed. The BIT analysis is conservative relative to the current, actual IP3 steam generator condition of approximately 1.4% (almost 1.5% for SG 34) "equivalent tube plugging" compared to the original steam generators.

Reference

NYPA letter, R.E. Beedle to the NRC Document Control Desk, dated May 4, 1993 (IPN-93-028), regarding boron injection tank Technical Specification changes.