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William J. Cahill, Jr.
Chief Nuclear Officer

January 17, 1996
IPN-96-004

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Mail Station P1-137
Washington, DC 20555

SUBJECT: **Indian Point 3 Nuclear Power Plant**
Docket No. 50-286
Response to Request for Additional Information (RAI), Response to Generic
Letter (GL) 95-03, Circumferential Cracking of Steam Generator Tubes

- REFERENCES:
1. NRC Letter from Jefferey F. Harold to William J. Cahill, Jr., "Request for Additional Information (RAI), Response to Generic Letter (GL) 95-03, Circumferential Cracking of Steam Generator Tubes, Indian Point Nuclear Generating Station Unit No. 3 (TAC No. M92248)."
 2. Letter from William J. Cahill, Jr. to the NRC, "Indian Point 3 Nuclear Power Plant, Docket No. 50-286, License No. DPR-64, Response to NRC Generic Letter 95-03: Circumferential Cracking of Steam Generator Tubes," dated June 27, 1995.
 3. Generic Letter 95-03: "Circumferential Cracking of Steam Generator Tubes," U. S. Nuclear Regulatory Commission, April 28, 1995.

Dear Sir:

This letter provides the Authority's response to the NRC's "Request for Additional Information (RAI), Response to Generic Letter (GL) 95-03, Circumferential Cracking of Steam Generator Tubes, Indian Point Nuclear Generating Station Unit No. 3," (Reference 1).

The additional information requested in Reference 1 is included as Attachment I to this letter . Attachment II to this letter contains NYPA's revised response to NRC GL 95-03. Attachment II is intended to replace requested action 3 from NYPA's letter dated June 27, 1995, (Reference 2).

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Attachment III of this letter contains the revised commitments associated with this letter. If you have any questions regarding this matter, please contact Mr. Ken Peters.

Very truly yours,

for Robert J. Deasy
William J. Cahill, Jr.
Chief Nuclear Officer
Nuclear Generation

Attachments: as stated

cc: U. S. Nuclear Regulatory Commission
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ATTACHMENT I to IPN-96-004

Response to NRC Request for Additional Information (RAI)
Regarding
Response to Generic Letter (GL) 95-03,
Circumferential Cracking of Steam Generator Tubes

**NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64**

The Authority's response to the NRC's Request for Additional Information, Items 1 and 2, is given below. This information supplements NYPA's response to Generic Letter 95-03, Circumferential Cracking of Steam Generator Tubes.

NRC RAI ITEM 1:

The following areas have been identified as being susceptible to circumferential cracking:

- a. Expansion transition circumferential cracking
- b. Small radius U-bend circumferential cracking
- c. Dented location (including dented TSP) circumferential cracking
- d. Sleeve joint circumferential cracking

In your response, cracking at the expansion transition was specifically addressed and you indicated that Alloy 690 thermally treated tubing is more corrosion resistant than other materials; however, areas b, c, and d were not specifically addressed. Please provide the requested information for these areas (and any other areas susceptible to circumferential cracking) per Generic Letter (GL) 95-03. The staff realizes that some of these areas may not have been addressed since they may not be applicable to your plant; however, this should be clearly stated with the basis for the statement (e.g., no sleeves are installed; therefore, the plant is not susceptible to sleeve joint circumferential cracking).

For dented locations, if applicable, the criteria for determining which dents are/were examined should be provided. If a dent voltage threshold is used for such a determination, the calibration procedure used (i.e., 2.75 volts peak-to-peak on 4-20% through wall ASME holes at 550/130 mix) should be provided.

NYPA RESPONSE TO NRC RAI ITEM 1:

NRC Generic Letter 95-03 addressed the issue of circumferential cracking of steam generator tubes. There are two types of tube degradation which can lead to circumferential cracking of steam generator tubes. On the primary side of the steam generators, Primary-side Stress Corrosion Cracking (PWSCC) is the tube degradation form which can lead to circumferential cracking. On the secondary side of the steam generators, secondary side Stress Corrosion Cracking (SCC) is the tube degradation form which can lead to circumferential cracking. Both types of tube degradation require a susceptible material, a source of stress, and a corrosive environment.

The NYPA response to GL 95-03, NRC Requested Action 1, and NRC Requested Action 2, applies to all areas susceptible to circumferential cracking, (i.e., areas a, b, c, & d), and therefore, no additional information is required. For GL 95-03, NRC Requested Action 3, NYPA will perform an augmented inspection for the detection of circumferential cracking at small radius (rows 1 and 2 only) U-bend locations and at dented locations during the next scheduled steam generator tube inspection. All dented location areas will be included in the population from which the augmented inspection sample will be developed. No voltage threshold will be used for dented locations. The sample size and sample expansion criteria will be in accordance with plant Technical Specifications.

As for area d., no sleeves are installed at Indian Point 3; therefore, Indian Point 3 is not susceptible to sleeve joint circumferential cracking.

NYPA revised the response to Generic Letter 95-03, NRC Requested Action 3, to include the augmented inspection for small radius (rows 1 and 2 only) U-bend locations and dented locations. See Attachment II for a revised response to GL 95-03 incorporating the response to this RAI.

NRC RAI ITEM 2:

During the Maine Yankee outage in July/August 1994, several weaknesses were identified in their eddy current program as detailed in NRC Information Notice 94-88, "Inservice Inspection Deficiencies Result In Severely Degraded Steam Generator Tubes." In Information Notice 94-88, the staff observed that several circumferential indications could be traced back to earlier inspections when the data was reanalyzed using terrain plots. These terrain plots had not been generated as part of the original field analysis for these tubes. For the rotating pancake coil (RPC) examinations performed at your plant at locations susceptible to circumferential cracking during the previous inspection (i.e., previous inspection per your GL 95-03 response), discuss the extent to which terrain plots were used to analyze the eddy current data. If terrain plots were not routinely used at locations susceptible to circumferential cracking, discuss whether or not the RPC eddy current data has been reanalyzed using terrain mapping of the data. If terrain plots were not routinely used during the outage and your data has not been reanalyzed using terrain mapping of the data, discuss your basis for not reanalyzing your previous RPC data in light of the findings at Maine Yankee.

Discuss whether terrain plots will be used to analyze the RPC eddy current data at locations susceptible to circumferential cracking during your next steam generator tube inspection (i.e., the next inspection per your GL 95-03 response).

NYPA RESPONSE TO NRC RAI ITEM 2:

No rotating pancake coil data has been collected during the previous inspection performed at Indian Point 3; therefore, no terrain plots were used during data analysis and no data will be reanalyzed using terrain plots.

In the NYPA response to GL 95-03, and in the response to NRC RAI Item 1, NYPA committed to perform an augmented inspection for the detection of circumferential cracking during the next scheduled steam generator tube inspection. The augmented inspection will use enhanced inspection techniques suitable for the detection of circumferential cracks. The methods, equipment, and criteria of the augmented inspection will be in accordance with the current revision of EPRI Report NP-6201 "PWR Steam Generator Examination Guidelines." If NYPA chooses to utilize the rotating pancake coil technique during the enhanced inspection, terrain plots will be used to analyze the rotating pancake coil eddy current data at locations susceptible to circumferential cracking.

NYPA revised the response to Generic Letter 95-03, NRC Requested Action 3, to include the requirement to use terrain plots to analyze the rotating pancake coil eddy current data at locations susceptible to circumferential cracking. See Attachment II for a revised response to GL 95-03 incorporating the response to this RAI.

ATTACHMENT II to IPN-96-004

**REVISED NYPA RESPONSE TO GENERIC LETTER 95-03
INCORPORATING THE NYPA RESPONSE TO THE NRC REQUEST FOR ADDITIONAL
INFORMATION DATED DECEMBER 11, 1995**

**NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64**

The following is the Authority's revised response to Generic Letter 95-03, requested action number 3.

GENERIC LETTER 95-03 NRC REQUESTED ACTION:

- (3) Develop plans for the next steam generator tube inspections as they pertain to the detection of circumferential cracking. The inspection plans should address but not be limited to, scope (including sample expansion criteria, if applicable), methods, equipment, and criteria (including personnel training and qualification).

REVISED NYPA RESPONSE TO GENERIC LETTER 95-03, ITEM 3, AS A RESULT OF THE NRC REQUEST FOR ADDITIONAL INFORMATION:

The New York Power Authority will perform an augmented inspection for the detection of circumferential cracking at hot leg expansion transition areas, small radius (rows 1 and 2 only) U-bend areas, and dented location areas during the next scheduled steam generator tube inspection. Sample size and sample expansion criteria will be in accordance with plant Technical Specifications. The augmented inspection will use enhanced inspection techniques suitable for the detection of circumferential cracks. The methods, equipment, and criteria of the augmented inspection will be in accordance with the current revision of EPRI Report NP-6201 "PWR Steam Generator Examination Guidelines." If a rotating pancake coil is used, terrain plots will be used to analyze the rotating pancake coil eddy current data at locations susceptible to circumferential cracking. The next steam generator tube inspection is required by Technical Specifications to be performed by June 1996. However, our schedule for the next steam generator tube inspection is currently being evaluated.

No sleeves are installed at Indian Point 3; therefore, the plant is not susceptible to sleeve joint circumferential cracking.

ATTACHMENT III to IPN-96-004

**AUTHORITY COMMITMENTS
RELATED TO
RAI FOR GL 95-03
CIRCUMFERENTIAL CRACKING OF STEAM GENERATOR TUBES**

**NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64**

COMMITMENTS ASSOCIATED WITH IPN-96-004

Commitment Number	Commitment	Due Date
IPN-96-004-01	IP3 will perform an augmented inspection for the detection of circumferential cracking on a sample of small radius (rows 1 & 2 only) U-bend areas. The sample size and sample expansion criteria will be in accordance with the Technical Specifications, and will be performed during the next scheduled steam generator tube inspection.	Next scheduled steam generator tube inspection.
IPN-96-004-02	IP3 will perform an augmented inspection for the detection of circumferential cracking on a sample of dented location areas. The sample size and sample expansion criteria will be in accordance with the Technical Specifications, and will be performed during the next scheduled steam generator tube inspection.	Next scheduled steam generator tube inspection.
IPN-96-004-03	If a rotating pancake coil is used, terrain plots will be used to analyze the rotating pancake coil eddy current data at locations susceptible to circumferential cracking.	Next scheduled steam generator tube inspection.