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Vice President

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January 12, 1996

Re: Indian Point Unit No. 2
Docket No. 50-247

Document Control Desk
US Nuclear Regulatory Commission
Mail Station P1-137
Washington, DC 20555

SUBJECT: Response to NRC's Request for Additional
Information (RAI), Response to Generic Letter 95-03,
Circumferential Cracking of Steam Generator Tubes,
Indian Point Nuclear Generating Station Unit No. 2
(TAC No. M92247)

By letter dated December 6, 1995, the Nuclear Regulatory
Commission requested additional information on Consolidated
Edison's response to Generic Letter 95-03
which we submitted by letter dated June 26, 1995. Transmitted
herewith is our response to this request.

If any further information or clarification of the information provided
is required, please contact Mr. Charles W. Jackson, Manager,
Nuclear Safety and Licensing and a conference call can be
arranged.

Very truly yours,



Subscribed and sworn to
before me this 12th day
of January, 1996.


Notary Public

KAREN L. LANCASTER
Notary Public, State of New York
No. 60-4643659
Qualified In Westchester County
Term Expires 9/30/97

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Attachment

cc: Mr. Thomas T. Martin
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Generic Letter 95-03

**RESPONSE TO REQUEST FOR ADDITIONAL
INFORMATION**

Docket 50-247

Generic Letter 95-03
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

RAI #1

1. In your response, you indicated that all hot-leg dented tube intersections in steam generators (SGs) 21 and 22 were examined with the Cecco 5 probe. Describe the criteria for determining which dents are/were examined. If a dent voltage threshold is used for such a determination, the calibration procedure used (e.g., 2.75 volts peak-to-peak on 4-20% through-wall American Society for Mechanical Engineers holes at 400/100 mix) should be provided.

Response

1. All hot leg tubes in Steam Generators 21 and 22 in which a dent restriction prevented adequate examinations using the 680 or 700 bobbin probes during the 1989, 1991, 1993, and 1995 examinations were examined using the Cecco-5 probe. The Westinghouse data analysis guidelines for analyzing dents were changed prior to the 1995 examination. The Cecco-5 probe provided an updated exam of the tubes with dents.

RAI #2

2. In your response, it was indicated that several indications at the roll transition were logged as circumferential; however, these indications were characterized as closely spaced axial indications. Please provide the basis for this characterization including a discussion of any other diagnostics performed (e.g., ultrasonic testing, penetrant testing, tube pulls), or to be performed on these tubes, to confirm this characterization. If no conclusive testing was performed to confirm the orientation of these indications, provide your assessment of the structural integrity of these indications assuming they were circumferential cracks. Discuss any potential operating interval restrictions.

Response

2. The characterization of the indications as closely spaced axial was based upon an evaluation of the Cecco-5 and Rotating Pancake Coil (RPC) data. Additional diagnostics were not performed; all tubes with roll transition indications were either plugged or repaired by rerolling to meet the F* criteria. The integrity of the tubes was evaluated under the F* qualification program. As stated in our original answer to Item 1 of Generic Letter 95-03 "The Indian Point 2 steam generator tube roll is at approximately 2.5 inches up from the lower tubesheet face or at approximately 11% of the tubesheet thickness. If the tube were to sever at the roll it would be contained by about 19.5 inches of the tubesheet, precluding a full bore leak." Additionally, the F*

reroll performed during the 1995 outage provided a new sealing surface to retain the tube against pull-out from the tubesheet. Therefore the structural integrity of the tubes would not be compromised by these indications assuming they were circumferential cracks. There were no operating interval restrictions.

RAI #3

3. It was indicated that Row 1 tubes were preventively plugged during construction and higher rows were examined as a part of the random sample. Please clarify the scope of these examinations (e.g., 20% of Row 2 tubes) and the probe used during these examinations.

Response

3. During the 1995 outage, the Row 2 tubes in Steam Generator 24 were 100% examined over their full length due to damage that was sustained to the hot leg tubes at the tubesheet as a result of the broken split pin which had migrated from the reactor to 24 steam generator hot leg. The split pin fragment was subsequently removed. The Row 2 tubes in the other steam generators were examined based upon the normal sampling plan. The sampling plan for the Indian Point 2 steam generators resulted in completing the full length tube examination cycle over a 4 exam period. The cycle consisted of the 1989, 1991, 1993, and 1995 examinations. The bobbin probe was used for the initial inspection and the RPC probe was used for characterization of all distorted bobbin coil indications.

RAI #4

4. It was indicated that 100% of the hot-legs and 20% of the cold-legs will be examined during the next refueling outage with an Appendix H qualified probe. Please clarify the inspections to be performed during the next outage (e.g., does this imply that all tubes in the four SGs will be examined over the entire hot-leg with a technique capable of detecting circumferential cracking). In other words, clarify the inspections to be performed at the roll transition, dented regions (including dented tube support plates), top of the tubesheet (as a result of other similarly designed plants observing circumferentially oriented degradation in this region), and tubes with small radii U-bends.

Response

4. The tubing will be examined with a technique qualified to detect circumferential cracking. In preparation for the next refueling outage inspection, the Cecco-5 probe will be qualified to accommodate tubes with larger dents. The Cecco-5 probe is capable of

detecting both axial and circumferential cracking. The Cecco-5 probe will be used for the roll transition, top of tubesheet, dented intersections, and u-bends. Small radius u-bends may require an RPC probe because of the physical flexibility limitations of the Cecco probe. The full length tube examination sampling size will be based upon Revision 4 of the EPRI PWR Steam Generator Tube Examination Guidelines, which is expected to require that 100% of the tubes be examined over a 60 EFPM cycle, with at least a 20% sampling size during each inspection.

RAI #5

5. During the Maine Yankee outage in July/August 1994, several weaknesses were identified in their eddy current program as detailed in NRC Information Notice (IN) 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 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 Generic Letter (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 with 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 SG tube inspection (i.e., the next inspection per your GL 95-03 response).

Response

5. Terrain plots of the RPC data were used as needed during the 1995 outage to characterize distorted bobbin probe indications. Terrain plots are only available with the RPC probe data. However, the Cecco probe provides data which can identify circumferential cracks without the use of terrain plots. This was verified by the EPRI Appendix H qualification program for the Cecco-5 probe which demonstrated that the Cecco-5 was at least equivalent in capability to the RPC probe. In prior outages, a sampling of tubes in Steam Generator 21 were examined at various locations with the RPC probe. During the 1995 outage, these tubes, and additional tubes, were examined with the Cecco-5 probe. The Cecco-5 exam confirmed the prior RPC results which had

established that there was no cracking at the support plates. At the request of Con Edison, secondary review of the Cecco qualification program was provided by the EPRI NDE Center.

In the upcoming 1997 inspection, we plan to use the Cecco-5 probe to a greater extent. Based on the capabilities of the Cecco-5 probe, we do not anticipate utilizing the RPC probe to develop terrain plots for all data locations. We may utilize terrain plots at selected locations to provide a visual display of the data.