John D. O'Toole
Vice President

Consolidated Edison Company of New York, Inc.
4 Irving Place, New York, NY 10003
Telephone (212) 460-2533

June 17, 1985

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

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

ATTN: Mr. Hugh L. Thompson, Jr.
Director
Division of Licensing

Dear Mr. Thompson:

This letter is in response to your letter of April 17, 1985, Generic Letter 85-02, regarding Staff Recommended Actions Stemming from NRC Integrated Program for the Resolution of Unresolved Safety Issues Regarding Steam Generator Tube Integrity. Attachment A to this letter contains our response to the seven items from Enclosure 1 to your letter. Attachment B contains our response to Enclosure 2 to your letter.

Should you or your staff have any questions, please contact us.

Very truly yours,

John D. O'Toole

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

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Attachment A

Response to Enclosure 1
Generic Letter 85-02

Consolidated Edison Company of New York, Inc.
Indian Point Unit No. 2
Docket No. 50-247
June, 1985

Response to Enclosure 1
Generic Letter 85-02

1a & b. Prevention and Detection of Loose Parts and Foreign Objects

During the 1982 steam generator examination, the secondary sides of all the steam generators were examined. A television camera was passed across the tube lane via the 6" handholes in such a way as to collect observations of the spaces or lanes between the columns of tubes.

During the 1984 steam generator examination, fiber optics were used in the secondary sides of all the steam generators along the entire periphery of the tube bundles and along the tube lanes. The objective of the examinations was to identify any loose parts or foreign objects on the tubesheet, and to look for external damage to peripheral tubes just above the tubesheet.

No visual damage was seen, but several foreign objects were found in each steam generator and, where practicable, they were removed. One object was identified as typical of a screw from a device used by Westinghouse for positioning support plates. One could be moved vertically slightly but could not be dislodged. All the remaining objects were fixed firmly in the tube bundle. They appeared to have been in the steam generators for sometime, probably from the time of final assembly. An inventory of the five objects remaining in the steam generators is listed in Table 1.

In steam generator 21, tubes R15C3, R15C4, R15C5, and R16C5 adjacent to an entrapped plate, were plugged. As a precationary measure, to eliminate danger to the active tube bundle from these tubes in the unlikely event that the foreign object would wear adjacent tubes, they were "stablized" by inserting bars extending through the tube sheet to the lowest support plate and then they were plugged. Analyses have been performed to assure the integrity of the active tubes which are adjacent to the tubes utilizing this alternative plugging configuration.

A continuous, on-line impact monitoring system capable of detecting loose parts in both the secondary and primary sides, was installed during the 1982 refueling/maintenance outage. This system meets the criteria of Regulatory Guide 1.133.

Maintenance and Quality Assurance/Quality Control (QA/QC) procedures for steam generator primary and secondary side maintenance, repair and inspection operations are reviewed and revised as necessary to ensure that an effective system exists to preclude introduction of foreign objects into either the primary or the secondary sides of the steam generators. The proceduresinclude (1) detailed accountability procedures for all tools and equipment used during an operation, (2) appropriate controls on possible loss of personal objects such as eye glasses and film badges, (3) cleanliness requirements and (4) accountability procedures for components and parts removed from the steam generators (e.g., reassembly of cut and removed components). Furthermore, secondary side examinations are scheduled so as to minimize the length of time the bundle is exposed to air.

2a & b. Inservice Inspection Program

Con Edison has conducted extensive steam generator tube examinations since the beginning of plant operation, generally exceeding existing requirements. The Indian Point Unit 2 Technical Specifications currently require each of the four steam generators to be examined no later than after 16 months of operation with a primary coolant temperature greater than 350F, or no later than 20 calendar months from the date of restart after the previous examination, whichever comes first. The Technical Specifications also require examination of at least 12% of the tubes in each steam generator hot leg and 3% of the tubes in each cold leg. Furthermore, the Technical Specifications address denting and define criteria for plugging tubes that are dented. During the previous several outages, Con Edison examined approximately 12% of the tubes in each steam generator from the hot leg tube sheet around the U-bend to the uppermost support plate on the cold leg side. In addition, approximately 4% of the tubes in each steam generator were examined for their full length; i.e. from the hot leg tube sheet around the U-bend to the cold leg tube sheet. Selected tubes were re-examined using a variety of eddy current techniques to verify the fact that the Indian Point 2 steam generator tubes are free of the types of defects recently found in significant numbers at other plants.

In the course of the 1984 steam generator tube eddy current examination, indications of tube wall wastage were reported for the first time and the examination program was expanded to further define the extent of the problem. All the tubes in all steam generators were examined; in two steam generators the tubes were examined for their full length, and in the remaining two steam generators all the tubes were examined (both hot leg and cold leg) for the length of the tube between the tubesheet and the lowest support plate (the region containing the eddy current indications).

A total of 116 tubes were identified in all four steam generators with indications greater than 20% of tube wall thickness. Of these, 84 tubes were plugged because the indications were greater than 40% of tube wall thickness. This constitutes 0.7% of the total number of active tubes. An additional 84 tubes were plugged in all four steam generators due to denting. The total tubes plugged to date in all four steam generators is 5.1%. Results of the 1984 steam generator inspection program are detailed in our letter to Mr. Steven A. Varga, dated September 20, 1984.

3a. Secondary Water Chemistry Program

The Indian Point Unit 2 operating license requires a secondary water chemistry program, and one has been in effect since initial operation. Procedure IPC-S-012 defines the non-radiological in-plant chemistry specifications. Standard Operating Procedure (SOP) 8.2 defines the procedure for secondary plant chemistry control.

Since 1978 Con Edison, has taken steps to approach the recommended water chemistry limits now set in the Westinghouse Owner's Group guidelines. For example, to reduce copper in the feedwater, the moisture separator/reheater bundles of copper-nickel tubing were replaced with type 439 stainless steel tubing, and the copper-nickel tubed high pressure feedwater heaters (26A, B, and C) were replaced with heaters containing type 304 stainless steel tubing. Admiralty alloy tubed intermediate heaters (24A, B and C) are scheduled to be replaced with 304 stainless steel tubed heaters during the 1986 refueling outage. The hydrazine admission point was changed from the condensate pump discharge to the turbine exhaust in order to more effectively reduce oxygen in the feedwater. We have installed and are testing an experimental high temperature magnetic filter to evaluate the feasibility of further reducing corrosion products (iron oxide and copper oxide) in the feedwater.

On the recommendation of Westinghouse, Con Edison initiated in 1978 and is continuing a boric acid treatment of secondary feedwater. It is Westinghouse's opinion that this boric acid treatment arrests corrosion of carbon steel and the resulting tube denting in the steam generators.

Additionally, to maintain high water purity in the steam generators, the feedwater is monitored at the first source of possible contamination, the main condensers. The condensate is analyzed for the major chemical constituents of river water, chlorides and sodium, and is monitored for total dissolved solids. A sodium flame photometer continuously monitors the main condensate pump discharge and alarms in the unit control room if the sodium increases beyond 0.002 ppm. If the river water sodium concentration were 1000 ppm, this alarm point would indicate a condenser leak of about 6 oz/min entering a condensate stream of about 3,000,000 oz/min (25,000 gpm).

3b. Condenser Inservice Inspection Program

The operating license does not require a condenser inservice examination. However, appropriate examinations of the condensers are conducted regularly during refueling/maintenance outages in accordance with Con Edison Engineering recommendations.

Unit 2 has three condensers, each containing two sections, for a total of six condenser sections and twelve water boxes. In total, there are approximately 72,000 admiralty tubes, 1 inch in diameter, 50 feet long. The condenser tubes, tubesheets and waterboxes are visually examined, and a random selection of tubes is examined by eddy current techniques. During the 1982 outage, more than 1500 tubes were examined; the smallest number of tubes from a single section is 165. The sampling plan yielded a statistically reliable evaluation of the entire condenser. In addition, a few tubes were withdrawn from the condenser and destructively examined to confirm the results of the eddy current examinations.

4. Primary to Secondary Leakage Limit

The current Indian Point Unit 2 Technical Specification 3.1.F contains primary-to-secondary leakage limits consistent with the latest revision of the Standard Technical Specifications. It should be noted that the leakage experience at Indian Point Unit 2 has been excellent.

5. Coolant Iodine Activity Limit

It is Con Edison's opinion that a direct application of the Standard Technical Specification provisions for Reactor Coolant System specific activity is not appropriate without further consideration of plant specific design features and operations. The basis for this item discusses highly unlikely circumstances and timeframes, and use of the proposed specific limits and surveillance frequencies may not be required to satisfy the intent of the specification. The bases for the Standard Technical Specification itself in fact point to the conservatism of the values due to the absence of specific site parameters from the staff evaluation. Thus, uniform application of such overly conservative limitations without consideration of plant-specific features may result in the imposition of unnecessarily stringent requirements. Such requirements may have no significant impact on public health and safety but may have an impact on normal plant operation and availability, and could lead to unwarranted plant shutdowns, undue cycling of plant systems and challenges to safety systems.

The above paragraph was part of our testimony in the recent Indian Point hearing. The Nuclear Regulatory Commission included this specific item in review of that hearing and rejected this requirement. See in particular the Commission Order dated May 7, 1985, at pages 37-38.

In addition, as part of our NUREG-0737, Supplement 1 program, we are implementing this fall a complete new set of emergency operating procedures based on the Westinghouse Owner's Group (WOG) Generic Guidelines. These new emergency procedures will ensure that if off-site power is retained and the Reactor Coolant Pumps manual trip criteria is not reached, no loss of forced reactor coolant flow will occur for a design basis Steam Generator Tube Rupture (SGTR) event. With the enhanced SI termination criteria these procedures essentially eliminate the potential for steam generator overfill in the event of a SGTR.

6. Safety Injection Signal Reset

In response to an NRC generic letter dated November 28, 1978 and IE Bulletin No. 80-06, Con Edison performed a detailed study to ensure the proper operation of control and protection logic and circuitry upon resetting the safety injection (SI) signal. With regard to the specific concern raised at Ginna - that of automatic switchover of Safety Injection pump suction from the Boric Acid Storage Tank (BAST) to the Refueling Water Storage Tank (RWST) - the Indian Point Unit 2 design is different. The SI pumps do not take suction from the BASTs. Indian Point Unit No. 2 has a separate tank - Boron Injection Tank (BIT) - which is aligned in parallel with the RWST on the injection pump suction. An SI signal provides automatic opening signals to the BIT parallel discharge valves such that initially safety injection suction is preferentially from the BIT. After the BIT has injected its contents, the discharge valves receive an automatic closing signal to isolate the tank. The safety injection pumps continue to take suction from the RWST. Unlike the situation at Ginna, the BIT low level signal will close the BIT discharge valves regardless of whether the SI signal is present or has been reset.

Table 1

INVENTORY OF OBJECTS REMAINING IN THE STEAM GENERATORS AT INDIAN POINT UNIT 2

S/G	Item	Size (Approximate)	Location	Position
21	Plate	1/4" x 1 1/2" x ? lg	Inlet, R15-16, C3-5, nozzle side	Protruding from bundle between tubes
22	Rod	1/8" x 10"lg	Outlet, R14-15 Manway Side	Back into bundle 4-5 columns
23	Plate	1/4" x 1 1/2" x ? lg	Inlet, R36-37, nozzle side	Protruding from bundle between tubes
23	Cylinder	3/4" x 1" lg	Inlet, R35-36, nozzle side	Resting in front of the Plate on the tube-sheet
23	Rod	1/4" x ? lg	Inlet, R43 C32-33	Protruding from the bundle and extending to the shell

Attachment B

Response to Enclosure 2
Generic Letter 85-02

Consolidated Edison Company of New York, Inc.
Indian Point Unit No. 2
Docket No. 50-247
June, 1985

Category C-2 Steam Generator Tube Examinations

Con Edison examines all four steam generators at each refueling outage. The objectives are 1) to define the overall condition of the steam generators and 2) to preventively plug all tubes which can be identified as potential "leakers" so as to minimize the risk of a forced outage during the fuel cycle.

"Denting" is the principal known degradation mechanism operating in the Indian Point 2 steam generators. The sample taken for examination includes all tubes known to be dented significantly plus a number of tubes representative of the bundle. If indications of any other degradation mechanism were found, the sample would be increased to define the problem and its extent.

The results of our 1984 Steam Generator Inspection Program are described in our September 20, 1984 letter to Mr. Steven A. Varga. Based on that experience, if an inspection program were to identify any significant unexpected inspection results, an assessment is made whether to scale the program up to 100% of all four steam generators. A sealing up of an inspection would be based upon three objectives. The first objective would be to conservatively bound our own Technical Specifications, in an orderly manner. The second objective would be to quickly bound the technical scope of any unexpected inspection results. The third objective would be to minimize the total outage time and any impact on other outage activities.