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December 22, 1993

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: Request for additional Information (RAI) Regarding
Generic Letter 93-04, "Rod Control System Failure
and Withdrawal of Rod Control Cluster Assemblies,
10 CFR 50.54(f)," Indian Point Nuclear Generating
Unit No. 2 (IP2).

Attached is the additional information requested by your
letter dated November 18, 1993.

Should you have any questions regarding this matter, please
contact Mr. Charles W. Jackson, Manager, Nuclear Safety and
Licensing.

Very truly yours,



cc: Mr. Thomas T. Martin
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ATTACHMENT

RESPONSES TO REQUEST FOR ADDITIONAL INFORMATION (RAI)
GENERIC LETTER 93-04

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
INDIAN POINT UNIT NO. 2
DOCKET NO. 50-247
DECEMBER, 1993

Introduction

By letter dated August 5, 1993, Con Edison provided its response to NRC Generic Letter 93-04, "Rod Control System Failure and Withdrawal of Rod Control Cluster Assemblies; Staff request pursuant to 10 CFR 50.54(f)".

In the response, Con Edison detailed how it had reviewed the rod control system electronics, the FSAR analyses, and the General Design Criteria (GDC) as pertain to Indian Point 2, and concluded that the licensing basis for the facility remained satisfied.

In addition, although not specifically required by the Generic Letter, Con Edison detailed its implementation of the recommendations of Westinghouse Nuclear Safety Advisory Letter, NSAL 93-007, Rod Control System Failure, dated June 11, 1993. Specifically, although already a part of operator training, operators were reminded of the importance of verifying proper rod movement using all available indicators when rod motion is required. In addition, the subject Westinghouse report has been designated required reading for licensed operators, and the control rod deviation alarm was tested and demonstrated to function correctly. Furthermore, Con Edison stated that it would support and follow the Westinghouse Owners Group (WOG) efforts with regard to the Salem 2 event. In fact, Con Edison Nuclear Power employees are involved in committees overseeing this effort.

The following information supplements our earlier response, as requested by the NRC's November 18, 1993 letter.

1. Hard Wiring

At Indian Point Unit 2, the control rods are electrically separated into groups. All control rods in a group are electrically tied together. A signal sent to one rod in the group will reach all other rods in the group unless there is a circuit failure. Thus, even a corrupted signal would go to all rods in the group, resulting in identical electrical response.

Circuit failures should result in diminished or no power to the rod, with the possible results being that the rod would either not move or fall into the core. Therefore, it is highly unlikely that a single failure would cause one rod to move in a different direction from the other rods in the group.

2. Deliberate Actions

Con Edison recognizes that a Salem 2 type event could be caused either by deliberate modification or maintenance action. To move a single rod, deliberate action must be taken to separate that rod electrically from the group. Lift disconnect switches are provided for this purpose, or physical wiring modifications would be required. Stringent administrative controls and alarms at IP2 make such occurrences highly unlikely. Nevertheless, Con Edison does not consider such deliberate actions to comprise a credible single failure for purpose of FSAR and GDC analysis.

3. Current Traces

Con Edison's review included a detailed, 2 step review of the control rod circuitry. The theoretical design was compared with the actual trace step history for control rods installed at IP2. The result of the review, even assuming hypothetical corrupt signals from circuit failures, demonstrated that a single rod would not move out of the core. Anticipated mechanism lag times reinforce this conclusion.

4. IP2 Actions

At Indian Point 2, as detailed in the previous letter on this subject, Con Edison implemented the interim action program recommended by the WOG. In addition, Con Edison employees have been a part of the working group for this effort and attended industry meetings on the subject. Our operations staff has notified all the operators of this event. In addition, awareness of this event has been incorporated into our training program. There is a heightened awareness within our operations group to monitor rod position during demanded rod motion.

5. Three Dimensional (3D) Analysis

As discussed in our original submittal, Consolidated Edison supports and is a participant in the WOG efforts with regard to the Salem event. One of the major results of this WOG program has been the demonstration that even in the unlikely event of an asymmetric rod withdrawal there is Departure from Nucleate Boiling (DNB) margin. This was demonstrated in WCAP-13803, Revision 1, entitled "Generic Assessment of Asymmetric Rod Cluster Control Assembly Withdrawal".

Based upon Con Edison's review of this WCAP, and the site specific data used to generate it, Con Edison concludes that Indian Point 2 is bounded by Westinghouse's analysis. As such, DNB does not occur for a worst-case asymmetric rod withdrawal.

6. General Design Criterion - Reactivity Control System Malfunction

The following is the appropriate IP-2 GDC assessment pertaining to this event:

Criterion: The reactor protection system shall be capable of protecting against any single malfunction of the reactivity control system, such as unplanned continuous withdrawal (not ejection or dropout) of a control rod, by limiting reactivity transients to avoid exceeding acceptable fuel damage limits (GDC 31) (IP2 FSAR Chapter 7).

This criterion is very similar to the one set forth in GDC 25. Specifically, Criterion 25 States: "The protection system shall be designed to assure that specified acceptable fuel design limits are not exceeded for any single malfunction of the reactivity control systems, such as accidental withdrawal (not ejection or dropout) of control rods." For the purpose of this event, IP2 meets the requirements of GDC 25.

Consistent with the NRC's interpretation of GDC 25, Con Edison has historically interpreted the fuel design limit referenced in the GDC to be the Departure from Nucleate Boiling (DNB) design basis.

Therefore, Con Edison believes that IP2 meets the GDC based on the following facts:

1. the asymmetric movement of a single rod distinct from its group as a result of a single malfunction is not a credible event, and
2. analysis (WCAP-13803, Revision 1) has shown that even with multiple failures that could cause a single rod withdrawal, the DNB design basis would remain met.

Conclusion:

In conclusion, Con Edison has reviewed the results of the Westinghouse generic safety analysis and the WOG's test program as they apply to Indian Point 2. The Westinghouse generic safety analysis concludes that Indian Point 2 is bounded by the results of these efforts. Acceptable fuel design limits (DNB) will not be exceeded during an asymmetric rod withdrawal event. In addition, the occurrence of such an event being initiated solely by a single malfunction is not a credible scenario. Con Edison sees no credible basis for presuming that a single credible failure could cause a single rod withdrawal. Furthermore, because single rod and rod group withdrawal can be tolerated by design, and there is now an enhanced awareness on the part of operators to the Salem event which would allow them to terminate such an event, there is now further assurance that the IP2 licensing basis remains satisfied. Based on the information regarding the Salem event and the subsequent analysis which is currently available, Con Edison believes Indian Point 2 is in compliance with the requirements of our GDC and GDC 25 and therefore meets the licensing basis for the plant with respect to the Salem event.