Paul H. Kinkel
Vice President

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January 6, 1998

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

Document Control Desk
US Nuclear Regulatory Commission
Mail Station P1-137
Washington, DC 20555-0001

SUBJECT: 10 CFR 50.54 (f) Notification in Response to NRC Generic Letter 97-04: "Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps"

Pursuant to 10 CFR 50.54 (f), this is Consolidated Edison Company of New York, Inc.'s (Con Edison's) 90 day written response to the subject generic letter.

Generic Letter 97-04, "Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps," dated October 7, 1997, requests that nuclear utilities submit information necessary to confirm the adequacy of the net positive suction head (NPSH) available for emergency core cooling (including core spray and decay heat removal) and containment heat removal pumps. The information requested is sought by the NRC staff to verify compliance with 10 CFR 50.46(a)(1)(I) regarding emergency core cooling system performance following a postulated loss of coolant accident, and conformance with the current licensing basis of the facility.

The Attachment provides the requested information for Indian Point Unit No. 2.

Should you or your staff have any concerns regarding this matter, please contact Mr. Charles W. Jackson, Manager, Nuclear Safety & Licensing.

Very truly yours,

Paul H. Kinkel

Subscribed and sworn to
before me 6th day
of January 1998.

200038

Karen L. Lancaster
Notary Public
KAREN L. LANCASTER
Notary Public, State of New York
No. 60-4643659
Qualified In Westchester County
Term Expires 9/30/99

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Attachment

cc: Mr. Hubert J. Miller
Regional Administrator-Region I
US Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. Jefferey F. Harold, Project Manager
Project Directorate I-1
Division of Reactor Projects I/II
US Nuclear Regulatory Commission
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Washington, DC 20555

Senior Resident Inspector
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Buchanan, NY 10511

ATTACHMENT

Response to NRC Generic Letter 97-04

Consolidated Edison Company of New York, Inc.
Indian Point Unit No. 2
Docket No. 50-247
January 1998

Introduction

The ECCS design at Indian Point 2 has three sets of pumps that are used to provide water to the reactor coolant system (RCS) in the event of a loss of coolant accident (LOCA). During the injection phase of a LOCA, the two residual heat removal pumps (RHR pumps) and the three high head safety injection pumps (SI pumps) take suction from the refueling water storage tank (RWST). After the water in the RWST is depleted, plant operators realign the ECCS for recirculation of water from the containment building floor back to the RCS. Two recirculation pumps located inside the containment building take suction from the recirculation sump and are used to pump water back to the RCS. The RHR pumps, located outside the containment building, can be used to back up the recirculation pumps and they take their suction from a separate sump inside containment (the containment sump). In the event RCS pressure is higher than the discharge pressure of the recirculation and RHR pumps, either set of pumps can have their flow aligned to the suction of the SI pumps (piggyback operation) for recirculation flow to the RCS.

Generic Letter Requested Information Item 1

Specify the general methodology used to calculate the head loss associated with the ECCS suction strainers.

Response to Item 1

Both the containment and recirculation sumps are protected from debris intrusion by floor gratings and screens. First, is a grating with 1" x 4" openings. Flow then encounters a 1/8" mesh screen.

We cannot confirm that the head loss across the gratings/screens was included in the original Westinghouse design calculations. Subsequent calculations by Bechtel in 1980 account for head loss from the approach velocity and friction. These calculations assumed 50% blockage of the mesh screens and up to 100% blockage of the grating above the sump. For the recirculation sump, the head loss through the mesh screens with 50% blockage is 0.023 ft. at 6000 gpm (two recirculation pump operation). For the containment sump, the head loss through the mesh screens with 50% blockage is 0.11 ft. at 6000 gpm (two RHR pump operation).

Generic Letter Requested Information Item 2

Identify the required NPSH and the available NPSH.

Response to Item 2

Residual Heat Removal (RHR) Pump

The required NPSH for the RHR pump is 10.5 ft. at 3000 gpm. The minimum available NPSH with one RHR pump at 3000 gpm is 24.4 ft., and with two RHR pumps at 6000 gpm is 16.6 feet.

Recirculation Pump

The required NPSH for the recirculation pump is 9.50 ft. The minimum available NPSH is 10.47 ft. at 3057 gpm with one recirculation pump.

High Head Safety Injection Pump

The required NPSH for the SI pumps is 22 ft. at 600 gpm. The available NPSH in the recirculation mode is supplied by the recirculation pumps or the RHR pumps. In this "piggyback" type of operation several hundred feet of head are available. The suction boost provided by the recirculation pumps or the RHR pumps significantly exceeds the required NPSH. Con Edison calculations estimate the minimum available NPSH to be 244 ft.

Generic Letter Requested Information Item 3

Specify whether the current design-basis NPSH analysis differs from the most recent analysis reviewed and approved by the NRC for which a safety evaluation was issued.

Response to Item 3

The current NPSH analyses differ from the original design analyses done for the issuance of the operating license. The original analyses did not appear to account for head losses from fluid velocity or sump screen resistance. The original analyses also relied upon short term operation of the recirculation pumps under cavitating conditions with operator action to throttle flow to avoid long-term cavitation. The current NPSH analyses consider instrument inaccuracies, sump blockage, and the effect of pump recirculation paths. For the recirculation pumps, the current analyses also consider recent information from the pump vendor regarding the recirculation pump's ability to function or operate at NPSH available levels below the recommended NPSH required levels.

Generic Letter Requested Information Item 4

Specify whether containment overpressure (i.e., containment pressure above the vapor pressure of the sump or suppression pool fluid) was credited in the calculation of available NPSH. Specify the amount of overpressure needed and the minimum overpressure available.

Response to Item 4

Containment overpressure is not credited when calculating the available NPSH for the recirculation, RHR, and SI pumps.

Generic Letter Requested Information Item 5

When containment overpressure is credited in the calculation of available NPSH, confirm that an appropriate containment pressure analysis was done to establish the minimum containment pressure.

Response to Item 5

As stated in response to Question 4, containment overpressure is not credited when calculating the available NPSH for the recirculation, RHR, and SI pumps.