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New York Power Authority

John C. Brons
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IPN-86-08

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

Attention: Mr. Steven A. Varga, Director
PWR Project Directorate No. 3
Division of PWR Licensing-A

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
NUREG - 0737 Technical Specifications
(NRC TAC #s M54395 and M54540)

Reference: 1) J. C. Brons letter to S. A. Varga dated October 4, 1985 (IPN-85-53)

Dear Sir:

Enclosed are probabilistic risk assessments for the proposed technical specifications submitted by Reference 1 regarding the Reactor Head Vent System and Containment Water Level Monitors as Attachments I and II, respectively.

Reference 1 submitted proposed technical specifications for the following NUREG-0737 items: Reactor Coolant System Vents (II.B.1), Noble Gas Monitors (II.F.1.1), Containment Water Level Monitors (II.F.1.5) and the Containment Hydrogen Monitors (II.F.1.6). With regard to the Reactor Coolant System Vents (Reactor Head Vent System) and Containment Water Level Monitors, the Authority has proposed technical specifications which are not in accordance with the recommendations of Generic Letter 83-37, "NUREG-0737 Technical Specifications."

The NRC Staff and the Authority discussed the differences between the proposed technical specifications and the those recommended by Generic Letter 83-37, during a telephone conversation. It was agreed during this conversation that the Authority would perform a probabilistic risk assessment to justify the proposed technical specifications for the Reactor Head Vent System and the Contaiment Water Level Monitors.

ADD: PWR - A/BC's TECH SUPPORT

AD - J. KNIGHT (ltr only)
EB (BALLARD)
EICSB (ROSA)
PSB (GAMMILL)
RSB (BERLINGER)
FOB (BENAROYA)

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Should you or your staff have any questions regarding this matter, please contact Mr. P. Kokolakis of my staff.

Very truly yours,

John C. Brons
Senior Vice President
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cc: Resident Inspector's Office
Indian Point Unit 3
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Mr. Don Neighbor, Project Manager
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ATTACHMENT I

Probabilistic Risk Assessment For The Reactor Head Vent System - NUREG-0737 ITEM II.B.1

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The generation of non-condensible gases arises from loss of cooling to the fuel, thereby, it heats up and leads to core melt. The purpose of the Reactor Head Vent System is to vent non-condensible gases from the high points of the RCS to assure that natural circulation will not be inhibited. The Authority conducted a Probabilistic Safety Study for IP-3 and evaluated all accident sequences leading to a core melt from internal events. The frequency for core melt has been established in the IP-3 Probabilistic Safety Study at 1.3×10^{-4} per year.

The Reactor Head Vent System has been designed and installed with redundant controlled vent paths even though one vent path is sufficient to perform the venting process. Each controlled vent path contains two solenoid valves in series which are kept closed during normal operation.

According to the proposed technical specifications, IP-3 may operate up to 90 days with one inoperable vent path. The probability of failure of a solenoid valve to open on demand is established as 4.98×10^{-4} per demand in the IP-3 Probabilistic Safety Study. The occurrence of a core melt along with a failure of the solenoid valve to open on demand simultaneously has a probability of 6.5×10^{-8}/year. The probability over a 90 day period is 1.6×10^{-8}. Since this is such a low probability, it can be considered a non-credible event.

The proposed technical specifications also state that IP-3 may operate for 7 days with both vent paths inoperable. The probability of the coincidence of solenoid valves in both vent paths failing to open on demand is 2.48×10^{-7}/year. The occurrence of a core melt along with this coincident failure has a frequency of 3.22×10^{-11}/year. Since this is such a low probability, it can be considered a non-credible event. Nevertheless, assuming the failure of the solenoid valves does occur, the probability of a core melt accident during the 7 day interval is 2.5×10^{-6}. The Authority concludes that this is an acceptable probability for operation of IP-3 during the 7 day interval.

In view of the above assessment, the Authority concludes that the proposed technical specifications for the Reactor Head Vent System do not compromise the safety of IP-3.

ATTACHMENT II
Probabilistic Risk Assessment For
Containment Water Level Monitors
NUREG-0737 ITEM II.F.1.5

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The Containment Water Level Monitoring System (wide and narrow range) gives a continuous indication of containment water level. This indication provides a means to monitor any leaks in containment and indicates the water inventory for operation of the Emergency Core Cooling System during an accident.

IP-3 has three (3) measuring loops for monitoring water level in containment: Containment Sump (El 38' 3") Narrow Range, 0' to 10'; Recirculation Sump (El 34' 0"), Narrow Range, 0' to 14'; and Containment Building (El 46' 0"), Wide Range 0' to 8'.

A leak or break in the Service Water System (SWS)is a source of water inside containment. However, a leak or break in the SWS will be detected by the narrow range water level monitors. Based on the narrow range monitors, the operator can isolate the SWS leak or break before a water accumulation problem exists inside containment. Therefore, the Authority concludes it is more conservative to analyze the accumulation of water from a postulated loss of coolant accident (LOCA).

The amount of water which could potentially accumulate inside the IP-3 containment as a result of a LOCA is shown below and is approximately 427,047 gallons.

a.	Refueling Water Storage Tank (RWST)	353,900 gals.
b.	Spray Additive Tank	5,100 gals.
c.	Accumulators and Piping	25,490 gals.
d.	Reactor Coolant System*	42,557 gals.

The RCS spillage (42,557 gallons), onto the containment floor assumes the Reactor Vessel remains filled to the bottom of the nozzle. Therefore, core recovery and reflood is accomplished and the core is not uncovered.

The maximum amount of water on the containment floor will be 427,047 gallons at the end of the recirculation phase (a+b+c+d). This amount of water will reach an elevation of about 50' (i.e. 4' water depth above the floor elevation of 46' 0").

* Start with a (RCS Inventory of 60,557 gallons which includes Pressurizer (62% Full); Pressurizer surge line (4 loops); Pumps (4); SG Primary and Reactor Vessel (Full), then reduce the RCS Inventory for the water remaining in the Reactor Vessel by 18,000 gallons.

The Containment Water Level Monitoring System (wide and narrow ranges) have overlapping ranges for at least two feet. This overlapping provides continuous water level indication from an elevation of 38'-3" to an elevation of 48' inside containment. Therefore, the failure of one (wide or narrow range) monitor will not inhibit the monitoring system from providing water level indication inside the above ranges. As stated above, a LOCA will cause water to accumulate to an elevation of approximately 50'. At this elevation, only the wide range monitoring system is present.

The wide range monitoring system consists of a sensor and a transmitter for each loop inside containment. The recorder and power supply are located in the Control Room. These components have a know failure data of about 1.0×10^{-6} per hour. However, for the purpose of this assessment it is assumed the wide range monitoring system is inoperable.

The probability of a LOCA along with the failure of the Emergency Core Cooling System is calculated in the IP-3 Probabilistic Safety Study as 4.5×10^{-5} per year. This valve includes breaks of all sizes, hardware failures and operator errors. The failure frequency for the proposed 7 day interval that the wide range monitors may be inoperable is 8.6×10^{-7}.

Since 8.6×10^{-7} is a low probability of occurrence, the Authority concludes that having the wide range monitors inoperable for 7 days does not compromise the safety of IP-3.