**William J. Cahill, Jr.**
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Regulatory File Cy

November 3, 1975

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


Mr. Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Reactor Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Reid

Attached is Con Edison's response to your letter of October 17, 1975. The answers provided respond to your questions concerning Con Edison's design for a natural draft cooling tower system at Indian Point Unit No. 2.

Very truly yours

William J. Cahill, Jr.

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Vice President

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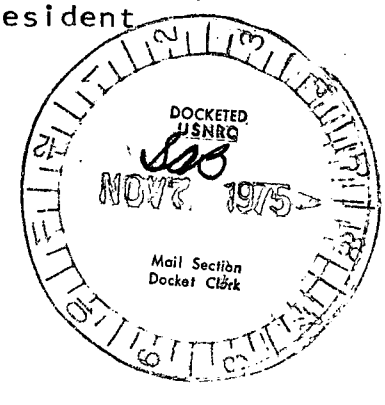


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1. Present a discussion of missiles which may be generated by the damaged or collapsed proposed cooling towers and demonstrate that the existing Category I structures in Units 1, 2 and 3 will not be endangered. Consider extreme environmental loads such as due to Seismic events, tornado, flooding, etc. Present acceptance criteria and methods of analysis.

The Indian Point Unit No. 2 Cooling Tower will be located at least a tower's height away from any Seismic Class I(1) structure or equipment on the Indian Point site. This requirement will prevent the postulated damage or collapse of the cooling tower from endangering the Class I or Category I structures or equipment in Units 1, 2 or 3. The capabilities of the plant to withstand missiles and other tornado effects are described in the answers to Questions 1.3, 1.11, 1.12 and 5.4 of the Indian Point Unit No. 2 Final Safety Analysis Report.

An analysis of the flooding potential at the Indian Point site was performed by the engineering firm of Quirk, Lawler and Matusky.(2) Earlier analyses of the hydrology at the site were performed by the firm of Metcalf and Eddy and by Mr. Karl R. Kennison(3). Briefly, these analyses examined river flow over a seventeen year period, recent meteorological and physical events such as hurricanes and tidal surges, and the potential flooding resulting from run-off from every major tributary of the Hudson River. The reports indicated that the combination of the hurricane surge, spring high tide and wave run-up will cause water level at Indian Point to reach a level

14.5 feet above Mean Sea Level. Since all Class I structures, components and equipment are located at Elevation +15.0 feet and above, the postulated maximum flood presents no threat to the safe operation of Indian Point plants.

The cooling tower basin itself will be located at about Elevation 45.0 feet. The postulated maximum flood will therefore have no affect on the integrity of this cooling tower.

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(1) Indian Point Unit No. 2 FSAR, Appendix A, Design Criteria for Structures and Equipment

(2) Indian Point Unit No. 2 FSAR, Question 2.1-1

(3) Indian Point Unit No. 2 FSAR, Section 2.5

2. Discuss the possibility of rupture of circulating water pipes and the effect of resulting local flooding in existing Category I structures. Present acceptance criteria and verification methods.

As stated in a letter sent to the Nuclear Regulatory Commission on February 18, 1975, Consolidated Edison Edison conducted a re-investigation of the possible failure of non-Class I equipment. The review found that no additional corrective measures beyond those taken in response to the Directorate of Licensing letter dated September 26, 1972 were necessary to protect safety-related equipment from potential flooding following the failure of non-Class I equipment.

These measures are in effect and the analysis that was performed is valid for operation with closed-cycle condenser cooling. The measures included installation of level alarms in the turbine building which would detect a rising water level following a postulated break in a circulating water pipe. Sufficient time would therefore be assured for the operator to trip the pumps before Class I equipment could be affected.

Inside the turbine building, all of the existing circulating water system piping will be used for the closed-cycle cooling system. Only a pair of valves and a connection at the discharge of each condenser waterbox leading to the four 150,000 gpm centrifugal cooling water feed pumps will be added. Should these

valves or the connections to the condenser waterbox outlet fail, the condenser cooling water would flow into the discharge canal which is located directly below this equipment. The discharge canal would direct this water out of the turbine building and operability of Class I equipment would not be jeopardized.

The remainder of the circulating water system piping inside the turbine building will not be changed. The flooding analysis that was referenced in the Con Edison letter of February 18, 1975 examined the consequences of a postulated failure of one of these pipes. This analysis is valid for operation with closed-cycle cooling of the condensers.

Outside the turbine building, the major portion of the piping for the closed-cycle cooling system is contained and buried underground. Failure of the pipes in these below-ground locations will not cause flooding that could jeopardize operability of any Class I equipment.

The only above-ground components or pipes in the closed cooling water system outside of the turbine building are the four centrifugal cooling tower feed pumps, the cooling tower itself and the connections between the cooling tower return piping and the condenser inlet piping. The natural geographic contour of the land in the Indian Point area will

protect Class I equipment from flooding following a failure of the pipes or components at these locations. Water will be directed away from the plant and any equipment important to safe shutdown of the plant. The natural grade of the land on which the cooling tower is situated will also direct water from a postulated failure of the cooling tower basin away from the plant and towards the river.

3. Discuss the effect of construction procedures on existing Category I structures: consider the effects of excavating, blasting, dewatering etc.

Con Edison has considerable experience with construction work and blasting on the site of an operating nuclear power plant. Both Indian Point Units 2 and 3 were excavated and built while Indian Point Unit No. 1 was operating. Prior to and during this period of construction, a controlled geotechnical investigation and monitoring program was conducted to assure that proper restrictions on blasting operations and construction practices were established and maintained. Similar precautions will be taken during the construction of the hyperbolic natural draft cooling tower for Indian Point Unit No. 2 to assure that no adverse effects to plant structures important to safety will take place.

As part of this program, Con Edison will establish limits on explosive charge quantities and fuse delays to assure that excavation blasting will not yield ground velocities or peak particle velocites (PPV) in excess of 1.0 inch/sec. while Indian Point Unit No. 2 is operational. These PPV readings will be measured by 3 component seismographs located at 2 sites selected for proximity to both the blasting location and Indian Point structures and equipment.

Con Edison will also restrict initial blasting to locations further than 150 feet from the nearest

existing Indian Point structure. Vibration data will be monitored by a full-time independent seismic consultant and plotted as scaled distance against PPV. As data is collected, the charge sizes will be adjusted to assure that the limiting PPV values are not exceeded. Blasting closer than 150 feet will not be allowed until a minimum of 25 blasts have been fired at a greater distance.

Dewatering during construction is not expected to have any effect on Unit 2 structures. Excavation for underground piping and tunnels near the Unit No. 2 turbine building and containment will result in a temporary lowering of the ground water table in the area, but because the major portion of the excavation will be in rock and all structures in the area are founded on rock, no risk of instability will result. Construction of the natural draft cooling tower is sufficiently distant from the other structures at Indian Point and is sufficiently elevated with the tower basin at about 45 feet above the river to have no effect on ground water table level at the site.