Docket No. 50-247

MAY 1 1 1966

Consolidated Edison Company of New York, Inc.
4 Irving Place
New York, New York 10003

Attention: Mr. M. L. Waring
Senior Vice President

Gentlemen:

As you know, meetings were held among representatives of the Commission's Regulatory Staff, the ACRS, the Consolidated Edison Company of New York, and the Westinghouse Electric Corporation on May 2, 3, and 6, 1966, to continue discussion of your application for a construction permit for the proposed Indian Point Nuclear Generating Unit No. 2. As a result of these meetings, it was agreed that additional information would be required to complete your application. Accordingly, you are requested to supply the information listed in the enclosure.

Your reply to the questions should be submitted as an amendment to your application.

Distribution
Doc. Room
Formal
Suppl.
C. Henderson
E. G. Case
L. Kornblith (2)
H. Steele
DRL Reading
R&PRSB Reading
Orig: PNorian

Sincerely yours,

Original Signed By
R.L. Doan

R. L. Doan, Director
Division of Reactor Licensing

Enclosure:
As stated above

cc: Messrs. LeBoeuf, Lamb, & Leiby
1821 Jefferson Place, N. W.
Washington, D. C. 20036

Attention: Arvin E. Upton, Esquire

OFFICE ▶	DRL	DRL	DRL	DRL		
SURNAME ▶	PNorian/lma	RSBoyd	EGCase	RLDoan		
DATE ▶	5/11/66	5/11/66	5/11/66	5/11/66		

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

INDIAN POINT NUCLEAR GENERATING UNIT NO. 2

ADDITIONAL INFORMATION REQUIRED

1. You have indicated that additional pressure vessel inspection is contemplated beyond that reported in the First Supplement. Please discuss the scope of these surveillance programs.

2. We understand that the proposed design of the safety injection system has been modified. Please provide a diagram of the modified system indicating the location of the essential equipment, discuss the proposed operation of this equipment for postulated small and large piping failures of the primary coolant system, and discuss the considerations which entered into the selection of the particular recirculation cooling layout chosen. Indicate the time period this equipment must function following an accident, and the maximum time the equipment can be inoperative without exceeding the containment design pressure. In consideration of the importance of achieving low leakage of radioactive materials from your facility, provide the design criteria for the auxiliary building and indicate how leakage of radioactivity from the enclosed equipment will be handled.

3. We understand that you intend to increase the heat removal capacity of the fan-cooler system. Please discuss how this increased capacity will be achieved, and indicate its effect on containment pressures following the postulated maximum credible accident. Also, provide a diagram and discuss the redundancy of the service water system that provides cooling for these units.

4. A potential source of hydrogen following a primary piping failure could be radiolytic decomposition of the safety injection water initiated by the decay energy of the core. Please discuss the magnitude of the gases formed by this process and its potential effect on containment pressure and concentration of free hydrogen in the containment vessel.

5. Provide an analysis of the primary system pressure, temperature, and power level transients that would result from a failure of a steam generator tube. State the amount of primary system radioactivity that could be leaked to the secondary system and to the atmosphere under these conditions. Discuss those design features of the secondary system which would limit the release of radioactivity to the atmosphere for this accident condition. How many tube failures can be tolerated before exceeding the pressure relief capacity of the secondary system safety valves?

6. Provide an analysis of the control rod cluster ejection accident and discuss your method for computing the consequences of this accident. Include a description of the criteria used to indicate fuel damage, and discuss the potential for damage to the primary system from these transients. Include information relative to transfer of energy from the hot oxide to the water to the vessel. Your answer should include a discussion of the conservatism

employed both in the parameters used and in the analytical models. Also discuss as quantitatively as possible, the manner in which changes in these variables would affect the results of your calculations. Support this where possible by direct calculations of the affect on your results of varying such important quantities as reactivity, Doppler coefficient, and moderator coefficient.

7. In order to evaluate the adequacy of the containment design for the consequences of a loss-of-coolant accident, it is desirable to consider the pressures that could result from energy added in a manner somewhat independent of a specific model. Please prepare a containment capability curve indicating the pressures resulting from various amounts of metal-water reaction occurring linearly with time in 500, 1000, and 2000 seconds. These curves should be drawn assuming (1) no engineering safeguards function, (2) only fan-coolers operate, and (3) the fan-coolers and spray pumps operate. Additional appropriate information such as containment atmosphere composition and temperatures should be presented.

8. We note that locked-open valves are to be installed in some sections of the safety injection system within the containment vessel. In view of the importance of this system to protect the reactor core and to maintain containment vessel integrity, we believe the position of these valves should be determined by other than procedural control when the reactor is in operation and the containment is closed. Please discuss contemplated means for assuring that these valves are open.

9. Please provide the following containment design information:

   a. In Table 5-4, page 5 of the First Supplement; Damping Factors: The damping for item (1) the containment structure, item (2) concrete support structure of reactor vessel, and item (5) concrete structure above ground including shear walls and rigid frames, are all shown as 5.0 percent of critical damping. It is our belief from available data that such high values can only be assured of existing in severely cracked concrete sections. A much more reasonable value would appear to be about 2.0 percent, a value which we would prefer be employed for items (1) and (2). We would not object to the use of 5.0 percent for item (5). Your comments on these considerations are invited.

   b. Although reference is made to the spectra to be employed, we find no plot or other adequate identification of the design spectra. We request that a plot of the spectra to be employed in the design be made available so that there is no question as to the magnitudes of the design forces.

   c. With regard to Question 7 in the First Supplement, we can find no statement indicating that in computing design forces the vertical seismic motion will be assumed to act simultaneously with the horizontal excitation. It is obvious from recordings of earthquake motions that excitation does occur in all directions simultaneously, and the design must reflect such loading conditions. A statement clarifying the intentions in this respect is requested.

d. No statements are made in the PSAR or in the First Supplement regarding safe shutdown provisions under seismic loading. What is the design criterion in this regard?

e. It is still not clear from Question 2 in the First Supplement and the discussion as to exactly what extent the containment liner participates in carrying loads. If it is fastened firmly to the concrete shell with Nelson studs, the liner will necessarily participate in terms of transmitting loads or alternatively providing resistance. More importantly perhaps is the question of use of Nelson studs with thin materials. What studies will be made or have been made to indicate that the zone of fastening between the stud and plate will remain uncracked and leak tight? There have been reported cases of fatigue cracking and strength difficulties of studs in cases where cyclic loading (even only a few cycles) occurred. Will any special welding techniques, inspection, tests, or research be employed to help lend confidence to this design? In our opinion, special studies relating to these problems are desirable, and we would appreciate your comments in this regard.