NATHAN M. NEWMARK
CONSULTING ENGINEERING SERVICES

111 TALBOT LABORATORY, URBANA, ILLINOIS

26 April 1966

Mr. Edson G. Case
Assistant Director
Division of Reactor Licensing
U. S. Atomic Energy Commission
Washington, D.C. 20545

Re: AEC Docket No. 50-247 File Copy (suppl. only)
Consolidated Edison Co.
Indian Point Nuclear Generating Unit No. 2

Dear Mr. Case:

Dr. W. J. Hall and I have examined the First Supplement to the Preliminary Safety Analysis Report for the above noted project. In connection with the questions and answers given in the section entitled "Containment Design Information" that follows Section 19, we offer the following comments.

1. In Table 5-4, page 5, 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. As we have discussed with Westinghouse personnel recently, 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 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).

2. Although reference is made to the spectra to be employed, we still 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.

3. With regard to Question 7, 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 here is necessary.

4. No statements are made in the PSAR or in the Supplement regarding safe shut down provisions under seismic loading. What is the design criterion in this regard?

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5. It is still not clear from Question 2 and the discussion as to exactly what extent the 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? We believe special studies are desirable.

We shall look forward to hearing further from you and the applicant regarding these points.

Sincerely yours,

N. M. Newmark

bjw
cc: W. J. Hall

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DATE OF DOCUMENT: 4-20-60	DATE RECEIVED 4-20-60	NO. 1210

Urbana, Illinois

LTR: x MEMO: REPORT: OTHER:

TO: Case

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ACTION NECESSARY ☐ NO ACTION NECESSARY ☐ CONCURRENCE ☐ COMMENT ☐ DATE ANSWERED: BY:

CLASSIF.: U POST OFFICE: REG. NO.:

FILE CODE: DOCKET: 50-247 (SUPPL. ONLY)

DESCRIPTION: (Must Be Unclassified)

Ltr. advising that both he (Newmark) and Dr. W. J. Hall have examined the 1st Supplment to the Preliminary Safety Analysis Report of Con Ed.....and hereby offering their comments regarding same..

ENCLOSURES:

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U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

NATHAN M. NEWMARK
CONSULTING ENGINEERING SERVICES

111 TALBOT LABORATORY, URBANA, ILLINOIS

26 April 1966

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U.S. ATOMIC ENERGY COMM.
REGULATORY
MAIL SECTION

Mr. Edson G. Case
Assistant Director
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U. S. Atomic Energy Commission
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Sincerely yours,

N M Newmark

N. M. Newmark

bjw
cc: W. J. Hall

18 January 1966

QUESTIONS

on

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2
(Docket 50-247)

File Copy (suppl)

by

N. M. Newmark and W. J. Hall

1. In load criteria on p. 5-8 (Exh. B, Vol. 2, Part A), what values of parameters correspond to the values of T, TLT', TL'? What are the temperatures in the interior and at the steel locations?

2. How is the lateral force (shear) in the structure carried? Is there shear reinforcement? For the liner, elastic stability provisions and load capacity based on yield are noted on p. 5-9. How does the steel liner participate in carrying the shear and other loads? What anchorage means is contemplated?

3. How will the splicing of the large 14S and 18S bars be handled? A general sketch of the contemplated reinforcing bar patterns is desirable.

4. What special provisions or special studies will be made to insure the adequacy of the penetrations (large and small) in terms of retaining strength and ductility while preventing leakage. Details of the concept of reinforcement around penetrations are desirable.

5. A tabulation of sources of stress, along with the appropriate allowable stress (or permissible resisting load and load factor) values, would help clarify the design approach. Also, a discussion of allowable ductility and provisions for obtaining same, is desirable.

6. On the basis of the data cited in the PSAR, and the probabilistic nature of earthquakes, it is believed that the design earthquake corresponding to 0.03g is too low. There is confusion on this point, for in citation (iii),

a 0.1g maximum earthquake is noted; clarification is required. What magnitude of vertical acceleration in earthquakes will be considered?

7. The population density within 5 miles, and less, is fairly high. Was this factor considered in arriving at the seismic criteria?

8. In citation (11) it is noted that "...any vertical acceleration would be counteracted by the weight of the building." This statement is not correct. Also, vertical seismic motion should be assumed to act simultaneously with horizontal excitation. A more scientifically valid criterion for the earthquake analysis is required.

9. In the table of damping values given on p. 5-16, the damping factors for the containment structure is shown as 7.0 percent of critical and for the concrete support structure, item 2, 5 percent. Similar values are shown in item 5. On what basis were these selected? Such large values correspond to rather heavily cracked concrete sections, stressed well into the yielding range. Lower values would be much more reasonable.

10. A description of the actual analysis techniques that will be employed in arriving at the design would be helpful. Only indirect statements about the procedures to be followed are given in the report on p. 5-16. What rigorous and acceptable procedures will be followed? How will the response spectra be employed in the procedures?

11. What criteria exist for adding the stresses arising from the different loadings, in contrast to combining loads? Since the loads act in different directions in many cases, a stress (or load resistance) combination approach would appear to be more rational. Discussion and comment is needed.

12. No mention of a stack was noted. Is a stack to be used? If so, will it fall in the Class I category for Seismic Design as noted on p. 5-13?

13. What wind loads will be assumed in the design?