

NATHAN M. NEWMARK
CONSULTING ENGINEERING SERVICES

1114 CIVIL ENGINEERING BUILDING
URBANA, ILLINOIS 61801

5 February 1969

Dr. Peter A. Morris, Director
Division of Reactor Licensing
U. S. Atomic Energy Commission
Washington, D.C. 20545

Re: Contract No. AT(49-5)-2667
Indian Point Nuclear Generating Unit No. 2
AEC Docket No. 50-247

Dear Dr. Morris:

Dr. Newmark and I have reviewed the Final Facility Description and Safety Analysis Report (Vols. I through IV) for Indian Point Nuclear Generating Unit No. 2. Recently we have been in communication with Mr. Cardone of your staff concerning the status of the foundation conditions at the Indian Point site, particularly with reference to Indian Point Unit No. 3, but also in connection with the present unit. Specifically the problem concerned the low core recovery for the limestone supporting the structures, which is a very hard but highly jointed limestone. On the basis of our studies we can see no potential difficulty with this matter and this is borne out by the reports of the geological specialists who have examined the site as well. However, it is unclear at this point whether the applicant is in the process of preparing a further report on this situation or whether the matter has been resolved. The status is known by Dr. Cardone of your staff. So far as we are concerned nothing further need be submitted. No further comment in this report is made concerning this aspect of the facility.

The Final Facility Description and Safety Analysis Report (FFD & SAR) is not much more informative than the original PSAR submitted for the

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construction permit review. This is especially true with regard to the Class I structures and equipment. Additional information is presented on the liner probably because of the difficulties that were encountered during the construction phase. Thus, our questions and comments, which follow, largely center about additional information as to the methods of analysis that were employed and the design as finally constructed.

1. On page 5.1.3-6 of the FFD & SAR it is noted that a report entitled "Indian Point 2 Containment Design Report" is in preparation. We should appreciate receiving a copy of this report as soon as it is completed if it will contain a description of the criteria and design implementation.

2. In the original PSAR for Indian Point 2, there was discussion of backfill which would be brought into contact with the containment structure. We note no mention of this item in the present FFD & SAR. It could have a bearing on the loadings to which the containment structure may be subjected. Additional information is requested on this aspect of the design as originally proposed.

3. One of the methods of demonstrating, at least in part, the adequacy of the containment structure is the proof test. Very little mention of the proof test is noted in the FFD & SAR; we should like additional information about this particular test, the nature of the measurements to be made, and the methods by which they are to be interpreted.

4. The brief discussion concerning the method of dynamic analysis is insufficient on which to draw any conclusions as to the methods employed or the results thereof. On page 5.1.3-7 there is brief mention of the dynamic analysis of the containment structure but additional information is required. It is noted there for example that the period ranged from 0.241 sec., when the vessel was assumed uncracked, to 0.0936 sec. when the vessel cross section

was assumed to be cracked. We should like additional information as to the assumptions made for the cracked cross section as used in computing the period, and also, of course, we should like to know which period was actually used in the computations that were made. Also we should like to have information as to how the structure was modeled for the dynamic analysis. Perhaps these items are discussed in detail in the reference requested in Question 1.

5. Little information is given concerning the actual analysis of the large penetrations, and the manner in which the reinforcing was carried around and into these penetrations. Additional information is requested on this aspect of the design, with supporting discussion to indicate how the deformations and forces were handled around the opening and in the transition zone into the main portion of the structure.

6. The analysis of the piping and reactor internals is mentioned in several places, for example Section 3.2.3, page 4.1.11, and page A-4. Evidently, from the information presented therein, the fairly recent Westinghouse piping criteria were not employed in the design of the piping for this plant; at least reference to this basis of design is not made in this report. Accordingly, the following additional information is needed with regard to the design of Class I piping and equipment.

(a) The method of dynamic analysis employed needs to be described. It is noted in several places in the FFD & SAR that the fundamental frequency of the piping system was computed and the peak value of acceleration on the spectrum was employed as the loading. It is noted further that by using this conservative value and demonstrating that the stresses are satisfactory, it becomes unnecessary to perform any further analyses to determine the natural period of the system. The question arises, then, concerning the method that

was employed to demonstrate that this procedure is adequate. We are interested in learning of the procedures that were employed to calculate the fundamental frequency for piping with traverse runs in several directions in three dimensions.

(b) We should like additional information about the manner in which the supports were chosen and in which the adequacy of these supports was ascertained. Also, we are interested in knowing how the location and types of snubbers and dampers were selected, and how this type of support system was fed back into the analysis for re-evaluation.

(c) We are particularly interested in knowing more about the stress and deformation criteria that were employed for the maximum earthquake to insure that under the maximum hypothetical earthquake the system will withstand the loadings and perform its function satisfactorily.

7. The design of the liner is discussed in several places in the FFD & SAR and particularly in Appendix X. Although tables of stresses are presented there for the liner, it is difficult to interpret these since the precise details of the methods of calculating these values are not given. Also, it would be helpful to have additional discussion of the significance of the numbers presented in these tables. The discussion given in Appendix C concerning the stress values noted is minimal and not particularly informative.

Also, in the very last part of Appendix C are given some pictures and notes concerning the buckling of the liner that was observed during the construction process. It is not clear from the information presented whether the liner "as constructed" meets tolerances set forth in the original criteria; if not, the significance of the lack of meeting the tolerances should be discussed.

It is noted in the FFD & SAR that two-inch local buckles are acceptable as a part of the criteria for the liner. We should like clarification as to

whether any two-inch local buckles do exist and moreover, if so, over what spatial extent do these buckles exist?

Also, on page C-49 in Section VI, Summary and Conclusions, it is noted under item (b) "a favorable review of the adequacy of the criteria has been made by N. M. Newmark and W. J. Hall and has been reported in Ref. 14." It seems most peculiar that our report on the PSAR would be used as justification in the FFD & SAR. Our report dealt with the initial criteria that were to be employed in the analysis and design of the plant and indeed have very little bearing on justifying any analysis and design that may have been made. In fact, at this particular point in time we wish to see whether, and in what manner, the criteria were met.

8. Only brief mention is given in the FFD & SAR to the seismic design criteria and implementation thereof for critical controls and instrumentation. Additional information on this aspect of the design is requested.

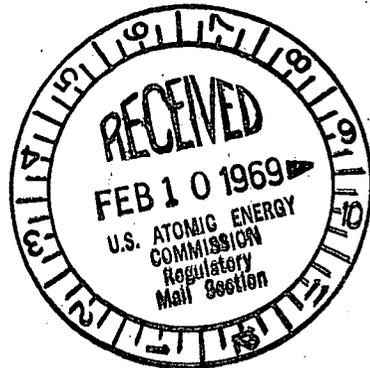
Respectfully submitted,



N. M. Newmark

bjw

cc: W. J. Hall
J. D. Haltiwanger
A. J. Hendron, Jr.
W. H. Walker



FROM: **Nathan M. Newark**
Urbana, Ill.

DATE OF DOCUMENT: 2-5-69	DATE RECEIVED: 2-10-69	NO.:
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TO: **Morris**

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Ltr furnishing review of the Final Facility Description & Safety Analysis Reports Vol's 1 thru 4 for Con Ed. Indian Point Unit 2....& requesting addtl

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A. Dromerick w/2 cys for action	1-10-69		

ENCLOSURES: **info....**

INFO CYS TO:			
H. Price & Staff			
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ACKNOWLEDGED

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