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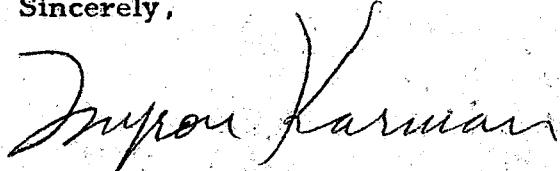
Leonard M. Trosten, Esq.  
LeBoeuf, Lamb, Leiby & MacRae  
1821 Jefferson Place, N.W.  
Washington, D.C. 20036

In the Matter of Consolidated Edison Company of New York, Inc.  
(Indian Point Nuclear Generating Station, Unit No. 2)  
Docket No. 50-247

Dear Mr. Trosten:

Pursuant to your request of October 20, 1972, I am forwarding herewith the staff responses to the seven itemized matters related to the staff analysis in the Final Environmental Statement.

Sincerely,



Myron Karman  
Counsel for AEC Regulatory Staff

**Enclosure:**

Cy of Con. Ed's Request  
of 10/20/72

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**RESPONSES TO CONSOLIDATED EDISON'S REQUESTS OF  
OCTOBER 20, 1972**

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Below are listed the responses to the specific items raised by Consolidated Edison in a letter of October 20, 1972.

1. Applicant's Request: In general, a listing of documents, whether published or not, other than those listed in the Final Environmental Statement (FES) prepared or considered by the staff in reaching its conclusions relative to the following "factors responsible for adverse effects" stated in Section VIIA. of the FES, I.E.:
  - "1. Entrainment of large numbers of planktonic organisms in the once-through cooling system.
  2. Impingement of large numbers of various fish species on the intake screens.
  3. Discharges of heated water to the Hudson River.
  4. Discharges of toxic amounts of residual chlorine or chloramines to the Hudson River.
  6. Reduction of dissolved oxygen concentrations in the effluent water."

Staff Response: The primary references used to provide the data base for the analyses of biological damage in the areas listed above are cited in the Draft and Final Environmental Statement, particularly in Sections II and V and in Appendices II-I, V-1 through V-3.

2. Applicant's Request: A listing of the documents prepared or considered by the Staff in reaching the conclusion that the environmental and economic impact of a closed-cycle cooling system is acceptable.

Staff Response: The major documents the Staff relied upon to evaluate alternate cooling systems were the applicant's Supplement No. 3 to the Environmental Report on Benefit-Cost dated February 15, 1972 and information on alternatives in Section 2.5 of the applicant's Supplement No. 1 to the Environmental Report dated September 9, 1971. Other references used included those listed in Section XI, pages XI-76-79, particularly References 3, 27-38, 43 and 44.

3. Applicant's Request: A listing of the documents (and particular portions thereof) relied upon by the Staff in preparing the following tabulations:

- a. Figures V-12, V-13, V-14 and V-15 (pp. V-57 to V-60)
- b. Figure V-16 (p. V-62)
- c. Figure XII-2 (p. XII-37)

Staff Response: Figures V-12, V-13 and V-14 in the FES were prepared using the Hudson River fishery data presented in Table 1, (Enclosure A) obtained from the reference "The Hudson; Fish and Wildlife" by the Hudson River Valley Commission, 1966 and the striped bass landings by region, 1930-66 (Enclosure B) by T. S. Y. Koo, "The Striped Bass Fishery in the Atlantic States," Chesapeake Science 11 (2): 73-93, June 1970 Three point running averages were used in plotting the data in Figs. V-12 and V-13. Plots in Figs. V-13 and V-14 were made using regression analyses of the data from Enclosures A and B. The data in Fig. V-13 are those with a 4 to 6 year difference between the Hudson landings and the Atlantic catch and those in Fig. V-14 involve a 1-year difference between the Atlantic catch and the Hudson catch.

The data for the New York effort for 1947-61 used in Fig. V-15 are presented in Table 8 (Enclosure C) in the above-referenced Koo's article and that for the Hudson River catch in Table 1 of Enclosure A. The same information (Enclosures A and B) was used to obtain the plot in Fig. XII-2 but only the Atlantic landings after 5 years were plotted with the Hudson landings. The plot is similar to Fig. V-12 except for a 5-year shift.

Figure V-16 (p. V-62) was obtained by plotting the information on white perch from the New York University "Ecological Survey of the Hudson River," Progress Reports No. 2 (1966), No. 3 (1968), and No. 4 (1969) and the report "Hudson River at Indian Point, Annual Report 4/16/68 to 4/15/69" (Appendix R of Supplement No. 1 to the Environmental Report, September 9, 1971.) Copies of the data from these references used for these graphs are provided. Information on white perch for 1966 consisted of the average catch of 131 for the young of the year (O+) and 87 for 1 year and older (1+) class of white perch for a total of 218 obtained from Table 18 on page 195 in "Distribution and Abundance of Fishes Along the Shores of the Lower Hudson During the Summer of 1966," by A. Perlmutter, E. Leff, E. E. Schmidt, R. Heller, and M. Siciliano in Hudson River Ecology, Hudson River Valley Commission of New York, 1966. The 1969 data on white perch is in Table 13, page 118 and Table 15, page 123 of the New York University's Annual Report for 1969.

Figure V-6 was obtained from information in Reference 41, Section V, page V-95 of the FES - "Studies on Fish Preservation at the Contra Costa Steam Plant of the Pacific Gas and Electric Company," by J.E. Kerr in the Fish Bulletin No. 92, California Department of Fish and Game, 1953.

Data on the one inch fish are taken from Figure 14, page 32 and that on the two inch fish are from Figure 15, page 32. The text includes information on the one-half inch fish.

4. Applicant's Request: "Provide any document prepared by the Staff relating to the impingement estimate of 2-5 million fish (page iii) and the methods used to compute such estimates."

Staff Response: The number, 5 million fish, killed at Indian Point Unit No. 2 was calculated on the basis of data supplied by the applicant in its testimony of October 19, 1971, in hearings before the Atomic Safety and Licensing Board, namely, the estimated weight of fish caught per day at reduced flow rate (437 lbs). Further, each fish was estimated to weigh a quarter of an ounce. Over a 182.5-day period (1/2 year, 6 months) the estimate is then:

$$\frac{437 \text{ lbs/day} \times 16 \text{ oz/lb}}{0.25 \text{ oz/fish}} \approx 30,000 \text{ fish per day} \quad (1)$$

$$30,000 \times 182.5 = 5.457 \text{ million} \approx 5.5 \text{ million fish per 6 months} \quad (2)$$

If the approximation of 30,000 is replaced by the absolute results of the arithmetic operations in (1) above, the calculation yields an estimate of 5.1 million fish for six months instead of 5.5 million, a difference of less than 10%. For a three-month period the values should be divided by 2. For the remaining 6 months, it is expected that no appreciable fish kills will occur, and thus the 5.5 million is an estimate for the year.

5. Applicant's Request: "Provide any document prepared by the Staff containing the mathematical derivation and the computer program for the Staff's entrainment model discussed in Appendix V-3."

Staff Response: As discussed in a telephone conversation on November 1, 1972, between the Staff's Counsel and the Applicant's counsel, the response would be best given by discussions between the appropriate persons which could be readily arranged. The basis for this is that the information is not in a readily understood form and is quite voluminous. We are submitting a sample program run in accordance with the referenced telephone conversation.

6. Applicant's Request: "Provide the computer program and samples of the actual computer printouts referenced on page III-41."

Staff Response: We are enclosing a program listing and printouts which are duplicates of that used to prepare the actual tables in the FES. After the document had been printed, an error in the program was found which changed some of the values calculated but did not affect conclusions drawn. A second, corrected, set of printout is also provided.

7. Applicant's Request: "Provide a listing of the documents (and particular portions thereof) relied upon by the Staff in preparing Table V-3, Figure V-1, and Figure V-10 on pages V-15, V-17, and V-51, respectively."

Staff Response: Table V-3, p. V-15 was prepared from the data contained in Appendix V-1, Section D, p. A-V-19 to 22 of the FES.

Figure V-1, p. V-17 is a plot in which the values or points are numbers which are keyed in Table V-4, p. V-18. The table would be clearer if the column headed "No." were headed "Point No." The reference are given in column 4 of Table V-4.

Figure V-10, p. V-51 is a plot of data obtained from two sources. All plots except that labeled "Lovett" came from the data in Reference 18, p. V-94, Raytheon Company, "Indian Point Ecological Survey: Final Report, June 1969 - October 1971," for the applicant. The top curve (Plankton Tow) in Figure V-10 is based on the grand average of data from Tables 6-2 and 6-8 depending on the number of sampling stations outlined in Table 6-1. The second curve on surface trawl came from Table 5-3 and the third curve on bottom trawl from Table 5-2 of Reference 18. The bottom curve is from data in Table 5-4 of Reference 18.

The plot labeled "Lovett" came from the data in Appendix E (Vol. III) of Quirk, Lawler and Matusky, Engineers, New York City, "Environmental Effects of

Bowline Generating Station on the Hudson River," Vols. I-IV, March 1971.

(Tables 10 through 29 contain the information which is summarized on page 9  
of Appendix E.)