UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
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CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. (Indian Point Station, Unit No. 3)	)	Docket No. 50-286

APPLICANT'S SUPPLEMENTAL RESPONSES TO CERTAIN INQUIRIES OF THE ATOMIC SAFETY AND LICENSING BOARD RAISED AT THE APRIL 1-2, 1975 EVIDENTIARY HEARING

1. Mr. Briggs' inquiry on salt deposition (Tr. 707-719).

Ambient salt sampling stations were continuously operated in the vicinity of the Indian Point Site from July, 1973 through August, 1974. Settleable particulate collection was accomplished by using standard duct buckets. Separate chloride and sodium analyses were conducted utilizing electrode conductivity for chloride and atomic absorption for sodium. The results indicated no stoichiometric relationship between the collected sodium and chloride as would be expected in sea salt (NaCl) analysis. Coincident analysis of ambient air concentrations of sodium and chloride indicated significant local industrial contributions.

The value of 160 $KG/KM^2/MO$ for ambient sea salt deposition given on page 6-21 of Volume 1 of the Consolidated Edison report "Economic and Environmental Impacts of Alternative Closed-Cycle Cooling Systems for Indian Point Unit No. 2; December, 1974" was the arithmetic average of the data collected at Indian Point. In arriving at this value, it was assumed that all the sodium measured was attributable to sea salt particles. Stoichiometric proportions were used to calculate salt deposition based on the measured sodium data.

As documented in WASH-1244, "The State of the Art of Saltwater Cooling Towers for Steam Electric Generating Plants; February, 1973", the natural background of salt decreases rapidly as the distance from the seashore increases. Indian Point is located approximately 75 kilometers inland from the coast. Based on an extrapolation from Figure VII-7 of WASH-1244, one would expect a deposition value of about 100 $KG/KM^2/MO$, if the analytical techniques used to evaluate the data points are comparable.

It is important to note that for the sixty-three (63) monthly deposition samples collected in the Indian Point area, chloride measurements ranged from 0.0 $KG/KM^2/MO$ during some summer months to over 100 $KG/KM^2/MO$ in the winter months. Coincident sodium analyses also indicate a maximum occurred in the winter. Local industrial sources and road salting operations during the winter probably account for the large range of data samples. Sodium values in summer months are also lower in magnitude than in the winter months. Monthly rainfall for the sampling period also contributed to the chloride values.

Operation of the natural draft wet cooling tower would be additive to the natural background salt deposition. Analytical results indicate that the peak annual average salt deposition from the tower would be 896 $KG/KM^2/MO$ (Volume 1, pages 6-15, and Volume 2, Appendix B, Table 3-1 of the aforementioned Consolidated Edison report). Added to the background value of 160 $KG/KM^2/MO$, the total salt deposition would be 1056 $KG/KM^2/MO$, which is well above the minimum value for potential botanical injury to hemlocks, white ash, and dogwood plants. (See Volume 3, Appendix B, Table 15 of the Consolidated Edison report).

2. Dr. Daiber's inquiry on returns from the striped bass tagging program (Tr. 607).

In 1973 a total of 149 striped bass larger than 400 mm were tagged in the Hudson River. A total of 17 of these tags were returned. This is a return rate of 11.4%. See Texas Instruments' 1973 Annual Report, pp. III-36 to III-46.

In addition, a total of 321 striped bass between 100 and 149 mm were tagged in 1973. None of these tagged fish were recovered. See Texas Instruments' 1973 Annual Report p. III-36.

During the stocking program in 1973 a total of 28,674 hatchery reared fish were placed in the Hudson River. As of December 31, 1974 a total of 46 of these tags were returned. This is a return rate of 0.16%. See Texas Instruments' 1973 report on the Feasibility of Culturing and Stocking Hudson River Striped Bass, pp. VI-6, VI-7.

In 1974 a total of 101,524 hatchery fish were stocked in the river, and as of December 31, 1974, a total of 167 tags had been returned. This is a tag return rate of 0.16% also. This data will appear in a hatchery study report to be available this spring.

3. Dr. Daiber's inquiry on entrainment studies (Tr. 620, 668).

The results of intake and discharge sampling for ichthyoplankton in 1972 are reported in Chapter 7 of New York University's Progress Report for 1971 and 1972, "Effects of Entrainment by the Indian Point Power Plant on Biota in the Hudson River Estuary". The survival of larvae is summarized in Tables 7-6, 7-7, and 7-8. The results of intake and discharge canal sampling for 1973 are in Chapter 7 of N.Y.U.'s Progress Report for 1973, "Effects of Entrainment by the Indian Point Power Plant on Biota in the Hudson River Estuary". The survival rate for various fish life stages is summarized in Table 7-4, 7-5, and 7-6.

Page 239 of the 1973 N.Y.U. report contains a description of the results of studies conducted when there was a thermal increase in the cooling water.

4. Dr. Daiber's inquiry on survival of hatchery and wild fish of the same age (Tr. 645, 646, 657, 658).

See item 2 above.

The ratio of survival of hatchery fish to wild fish was found to vary from 1.29 to 2.0 for 1973. See Texas Instruments' "Feasibility of Stocking and Culturing Hudson River Striped Bass," 1973 Annual Report, July, 1974; Table VI-5, page VI-7. The hatchery fingerlings were less susceptible to capture than were wild fingerlings, probably because the hatchery fish were larger than wild fish at the time of stocking and therefore better able to avoid collecting gear.

There is no data available on the growth rate of hatchery fish after stocking or on the general health of stocked hatchery fish.

5. Dr. Daiber's inquiry on the size of the striped bass population for 1974 that was subjected to impingement (Tr. 669).

Striped bass population estimates for 1974 are not yet available. In 1973 a total of 1,972 striped bass were collected at the intakes of Indian Point Units 1 and 2. See Texas Instruments report "Indian Point Impingement Study Report for the Period 15 June 1972 through 31 December 1973", December, 1974; Table A-1.10, page A-7. The population of young-of-the-year striped bass in the fall of 1973 between river miles 12 and 62 was estimated to range between 1,110,000 and 3,144,000. See Texas Instruments report "Hudson River Ecological Study," 1973 Annual Report, July 1974, Table III-25, page III-49.

6. Mr. Briggs' inquiry on changes to the Lawler, Matusky and Skelly striped bass life cycle model since the Indian Point Unit No. 2 hearings (Tr. 685).

Lawler, Matusky and Skelly Engineers has made the following changes in the Striped Bass Life Cycle Model:

(a) Changes in the numerical solution procedures and the programming code which increased the efficiency of the program by a factor of ten.

(b) Changes in the programming code which enabled the model to accept more segments in the longitudinal direction. This change was important for implementing 1973 data.

(c) A transport avoidance factor was added to the model equations to account for those organisms found very close to the river bottom.

(d) Conversion to real time to provide a more realistic simulation of the tidal action in the estuary and the effect of hydrodynamics on the distribution of early life history stages.

(e) Two layers are employed in the vertical direction so that the diurnal migration of larvae and the concentration of eggs in the bottom layer can be simulated.

(f) The longitudinal dimension is divided into 29 segments.

7. Mr. Briggs' inquiry on statistical analysis of "f" factors by Lawler, Matusky and Skelly (Tr. 686).

No statistical analysis of "f" factors has been performed.

8. Mr. Briggs' inquiry on the difference in the estimated year class size for 1972 and for 1973 (Tr. 682).

There is no readily apparent reason for the difference in the size of year classes of striped bass and white perch in 1972 and 1973. However, such variations in year class size are common for many species of fish.

9. Dr. Daiber's inquiry on the statistical procedures utilized in table 3 of the NYU report "A Preliminary Analysis of the Abundance of Four Life History Stages of Striped Bass (Morone saxatilis) collected in the Intakes of Indian Point Unit No. 1 and in the Hudson River in Front of Indian Point." (Tr. 624, 630, 631).

The 95% confidence intervals around the mean are the same for each estimate in table 3, page 16, because the interval was determined from Analysis of Variance tables rather than being calculated independently for each set of samples.

The last number in table 4, page 16, is 35. This value is correct. It is different than the two values directly above because the sample size was different, which resulted in a different confidence interval when rounded off.