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Docket No: 50-286

FEB 9 1973

Mr. William J. Cahill, Jr
Vice-President
Consolidated Edison Company
of New York, Inc.
4 Irving Place
New York, New York 10003

Dear Mr. Cahill:

This letter will confirm the site visit and meeting related to our environmental review of Indian Point Unit No. 3 for February 21-22, 1973. Please find enclosed a list of topics which we propose to use as an agenda for our discussions with you and your consultants during this meeting.

Dr. M. J. Oestmann, who has been designated as Project Manager for the preparation of the environmental statement, will represent the Regulatory Staff at this meeting. She will be accompanied by several members of the AEC staff and consultants who are providing technical support in our environmental review. Please feel free to contact Dr. Oestmann at area code 301-973-7370 if additional information is required.

Sincerely,

Original signed by
George W. Knighton

George W. Knighton, Chief
Environmental Projects Branch No. 1
Directorate of Licensing

Enclosure:
Agenda Pertaining to Indian Point
Unit No. 3

cc: Arvin E. Upton, Esq.
LeBoeuf, Lamb, Leiby & McRae
1821 Jefferson Street, N.W.
Washington, D. C. 20036

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TOPICS FOR DISCUSSION
Indian Point Unit No. 3
Consolidated Edison Company
of New York, Inc.
AEC Site Visit - February 21-23, 1973

The following list of topics and data needs will be used as the basis for discussions to be held during the site visit of February 21-22, 1973. The discussions, however, will not be limited to this list.

I. INTRODUCTION

A. Permits

1. The Federal Water Pollution Control Act was amended in 1972. The status of any water quality certification granted to the applicant from New York State should be presented in view of this new amendment.

2. Based on experience of fish kill problems at the intake structures at Indian Point Units Nos. 1 and 2, the status of any agreements made with the New York Department of Environmental Conservation regarding modifications of the intake structures should be described.

3. If available, the permit from the NYS Department of Environmental Conservation to discharge effluents through the discharge structure should also be provided.

B. Organization Responsibility

1. The Hudson River Valley Commission has been mentioned in the Environmental Report. Any information regarding its organization, authority and responsibilities, if available, would be desirable.

II. THE SITE AND ENVIRONS

A. Ecology of the Area

1. A vegetation survey listing species composition and relative abundance of major plant species within a 2-mile radius of the plant is required. All croplands, pasture areas, gardens, etc., occurring within a 5-mile

radius of the plant site should be included. In addition, the approximate composition (species-%) of the proposed 80-acre natural area on the site should be provided.

2. A survey of faunal composition including specific information relative to population densities and numbers of mammalian and avian species occurring within a 2-mile radius of the plant site is required. Information should include best estimates of occurrence of transient species, as well as information regarding any unusual habitat preferences which may be ascribed to the species mentioned.

3. A recent (not older than 6 months) aerial photo of the site area, with a scale similar to that shown in Fig. 9, 4-14 of the applicant's Environmental Report for Indian Point Unit No. 3 should be supplied.

4. A large contour map of the area within a 50-mile radius of the Indian Point site showing site location, all other generating facilities (steam plants and hydro stations), improved and unimproved roadways, railroad rights-of-way, transmission line corridors, ecological and meteorological sampling stations, locations of substations and switching assemblies, population centers and airports should also be supplied.

B. Water Chemistry

1. Monthly average values of salinity and total dissolved solids for one recent calendar year for the Hudson River at a point and depth representative for the Indian Point Unit No. 3 intake should be supplied.

2. Data for total dissolved solids in Hudson River water at a point and depth representative for Indian Point Unit No. 3 intake should also be supplied.

3. Concentration levels of ammonia, nitrogen, total organic carbon and copper already present in the Hudson River averaged over a monthly period for one year should be reported.

C. Meteorology

1. Meteorological information supplied is largely of pre-1960 vintage. Either an updated version of all information contained in the environmental report and supplements for Unit No. 3 or evidence to document whether or not annual meteorological conditions recorded previously may be expected to recur within reasonable limits should be supplied. Information on the ambient temperature and relative humidity values corresponding to the wind frequency distribution given in Appendix C, Tables I through IV in Volume I of the Environmental Report should be included.

2. The frequency of occurrence of atmospheric inversions at the Indian Point site should also be provided.

3. With reference to Table 3.1.1 of the Benefit-Cost section in Supplement 2 to the Environmental Report, information on the frequencies (number of hours annually) of fog naturally occurring in all of the specified sectors is needed.

4. On page 3.1-1 in the Benefit-Cost section, Alternative B, a statement is made as to the "annual frequency of saturation deficits over Poughkeepsie, New York." Reference to this information should be presented.

III. THE STATION HYDRAULICS, THERMAL AND CHEMICAL DISCHARGES

A. Hydraulics of the Station

1. Since an environmental report has yet to be filed on Indian Point Unit No. 1, certain information that is necessary for evaluation of all three units operating simultaneously is required. As such, a schematic flow diagram, or equivalent description of the steam and condensate systems for both the nuclear and fossil-fired sections of the Unit No. 1 plant should be provided. The cooling and service water systems in the nuclear and fossil-fired sections, giving flow rates, pressures and temperatures should be described.

2. A block diagram of water usage with approximate inventory of water in the cooling and service water systems of each unit is required.

3. The dimensions of the cooling and service water systems discharge conduits and canals, giving dimensions, lengths, etc., of the various sections for Units Nos. 1, 2 and 3 should be included. The time of occupancy of a particle of water in the various sections during different pumping flows should also be presented.

4. The procedure for cleaning, and the frequency of cleaning of the fixed fine screens now in use at the Indian Point Units Nos. 1 and 2 water intake structure should be described. If fixed fine screens are planned for Unit No. 3, the location and method of cleaning should also be described.

5. The material used and the size of surface area for the steam turbine condenser tubes in Units Nos. 1, 2 and 3 should be described. Other major materials of construction in the cooling and service water systems, and the typical pressures, temperatures and water velocities they are exposed to should be provided.

6. Reference is made on page 9-6 and in Figure 18 of Supplement 3 of the Environmental Report to possible modifications of the intake water structures for Units Nos. 1, 2 and 3, pending results of tests of bubble curtains. The present firm plans for the water intakes, including dimensions, screen arrangement, fish avoidance mechanisms, etc., should be stated.

B. Thermal Discharges

1. A copy of the Quirk, Lawler and Matusky report, "Effect of Three-Unit Operation at Indian Point on Hudson River Temperature Distribution, October 1972" should be furnished. (The Environmental Report references this report as Appendix DD, which has not yet been furnished to the staff.)

2. A copy of the Alden Research Laboratory report, "Indian Point No. 3 Extended Model - Three Unit Test, November 1972" should also be furnished to the staff. (The Environmental Report also references this as Appendix DD, which has not been furnished to the staff.)

3. In Supplement 3 of the Environmental Report on page 9-14, the potential difficulties in meeting the New York State thermal criteria with concurrent operation of Indian Point Units Nos. 1, 2 and 3, Bowline Units Nos. 1 and 2, and Lovett Units Nos. 1 through 5 are discussed and further analyses are being made of the situation. The results and conclusions drawn from these studies, including also the effect of simultaneous operation of the Roseton Plants, if this has been included, should be provided.

4. In Supplement 3 of the Environmental Report, on page 9-14 it is stated that "the feasibility of developing a more effective effluent discharge scheme, such as a submerged thermal diffuser, will be explored." The results and conclusions drawn from this exploration should also be provided.

5. Any additional field or model data that have been developed since preparation of the Environmental Report on Indian Point Unit No. 3, and Supplements 1 through 3 thereto, should also be furnished, that would add to the knowledge of dilution flows, degree of vertical mixing, thermal stratification factors, dispersion coefficients, etc., in the Hudson River at Indian Point.

6. In the Supplement 3 to the Environmental Report, on page 9-2, reference is made to a modification whereby the discharge of one pump has been temporarily rerouted to the discharge canal. Explain how this rerouting will be used "to evaluate the fish protection features" of the channel wall modification. What evaluation has been made of the arrangement?

7. The initial rated capacities given in Table 9-I, page 9-10 of Supplement 3 to the Environmental Report total 2103 MWe for all three units, and the corresponding "heat load" is given as 15.215×10^9 Btu/hr (365.2×10^9 Btu/day). However, in paragraph 2, page 9-17, the total electrical capacity is given as 2114 MWe with a corresponding "heat load" of 345×10^9 Btu/day. This discrepancy should be clarified.

C. Chemical and Other Discharges

1. The details on the usage of the flash evaporator to distill river water for make-up need clarification. The average volume of water distilled, the concentration factor and the estimated average amount of H_2SO_4 used should be presented.

2. The method for determining the residual chlorine discharge should be discussed. A description of the different forms of chlorine included in the term "residual" should be provided. Methods used to reduce the amount of chlorine used and discharged should also be considered.

3. If the filter beds in the sewage system are overloaded and chlorination becomes necessary, the amount of chlorine to be used should be estimated and the method to be used for monitoring the chlorinated effluent as well as the point of discharge into the river should be presented.

4. Is there a separate laundry for Unit No. 3?

5. The method of disposal of the "sludge" removed from the septic tanks should be described.

6. The source of potable water and its treatment, volume, etc., should be described.

7. A description of any expected condenser corrosion and its expected rate is needed.

8. Details on the primary system demineralizers such as the maximum amount of NaOH to be used, amount of water flow etc., should be provided. This should also include the amounts of H_2SO_4 and NaOH used for each ion exchange regeneration cycle.

9. Details on the type of monitoring to be carried out for the heavy metal ions in the effluent, including type of analysis, sensitivity, etc., should be presented.

10. The chemicals, quantities and disposal of all degreasing and cleaning solutions used prior to start-up should be indicated.

11. The methods of disposal of oil and grease leakage from the various components should also be presented.

12. Does the release of the cooling water corrosion inhibitor refer to ppm K_2CrO_4? Cr?

13. Are the concentrations at the confluence calculated on the assumption that plant discharges completely mix with the complete flow of the Hudson River? If so, the dispersion model should be described. If not, the basis used for the calculation should be given.

14. The Environmental Report for Indian Point Unit No. 3 gives the total boron discharged as 900 lbs/day from all 3 units with Unit No. 3 discharging 300 lbs/day. The ER for Unit No. 2 cites 600 lbs/day discharged from each Unit No. 1 and Unit No. 2. The apparent discrepancy needs explanation.

15. The apparent differences in usage (lbs/day) and concentrations of hydrazine, morpholine and cyclohexamine discharged from each of the 3 Units should be explained.

16. In regards to Unit No. 1, information is needed on the frequency and amounts of chemical additions to and discharges from the different water systems and on where they are introduced and discharged. Include the chemical analysis of the boiler blowdown.

IV. ENVIRONMENTAL IMPACTS OF PLANT OPERATION

A. Impact of Transmission Facilities

1. Any information available regarding the purchase of additional rights of way for transmission lines to Millwood or Spain Brook should be provided.

2. The plans for providing access to transmission lines for removing vegetation and for other purposes should be described. The number and length of new access and service roads required for maintenance should be stated.

3. An estimate of the number of transmission towers required for each route should be supplied.

4. Plans for clearing vegetation and maintenance of right-of-ways should be described.

B. Radiological Impact

1. Insufficient information is presented in the Environmental Report or Supplements to reproduce the dose rates on biota. Specifically, a table of biological accumulation factors should be provided as well as the necessary information to reproduce the dose rates given in Table 14-3 in Supplement 2.

2. In addition, a discussion of any direct exposure that may be incurred by the off-site population from on-site radioactivity is also lacking.

3. In addition, the distances from the point of release of gaseous effluent to the nearest milk cow and site boundary in each of the 16 sectors are required. Also, the distances from the point of release of gaseous effluents to the nearest residences in the different sectors surrounding the site particularly along the east bank of the Hudson River are needed.

4. In determining doses from plant accidents, the detailed assumptions used in calculating the consequences of each class of accidents are required. Details of the meteorology used in determining the estimates of doses at the site boundary and the integrated man-rem dose to 50 miles are needed.

C. Biological Impact

1. According to page 13-1 of the Environmental Report, daily maximum and minimum temperatures and dissolved oxygen values for 1971 and 1972 for water pumped directly in front of the intake canal from a depth of 13 3/4 feet below mean low water have been monitored by the Automated Environmental System and should be supplied.

2. Daily maximum and minimum temperature, salinity and dissolved oxygen values for 1971 and 1972 for water pumped directly from the effluent canal from a depth of 5 1/2 feet below mean low water should also be provided.

3. Values for maximum, minimum and average passage times from the intake structure to the end of the discharge canal for each of the three units should be provided.

4. Daily records for 1971 and 1972 of fish impinged on Unit No. 1 intake screens, including number of fish of each species, mean length and weight and some measure of variability about this mean length and weight should be supplied. Questions on the effects of chemical discharges, thermal discharges, reduced dissolved oxygen impingement and entrainment will also be presented.

V. COMMITMENT OF RESOURCES

1. What are your plans for use of the site when operation of the nuclear plant finally terminates? The structures that will be removed should be identified. Other action that will be taken to clear the site should be described. Any licensable quantities of radioactive materials that would be stored on site, the term of such storage, and arrangements for custodial care should also be identified. Estimate the cost of decommissioning on the basis of the present economy. If decisions on these measures have not yet been made, provide this information for each alternative that you believe to be practicable.

2. The quantities (in Kg) for Unit No. 3 of the following materials that will be utilized during the term of the operating license for initial and replacement loadings of reactor core components should be estimated. (Exclude hydrogen, carbon, nitrogen, oxygen, fluorine, neon, sodium, magnesium, silicon, phosphorus, sulfur, chlorine, argon, potassium, calcium, arsenic, selenium, bromine, krypton, xenon, and trace elements.)

   a. Control elements, including fixed shims - specify for each element (e.g., Fe, Ni, Cd, B) and include the assumed loading and replacement schedule.

   b. Fuel input to the reactor in the form of the initial and replacement core loadings should be described as follows:

      1. U - The quantity of contained uranium at each enrichment introduced in new fuel elements and the assumed reloading schedule should be presented.

2. Pu - The quantity and isotopic composition of contained fissionable plutonium and other fissile and fertile materials introduced in new fuel elements and the assumed loading schedule should be estimated.

3. Zirconium alloy constituents itemized by element.

4. Other structural materials in fuel assemblies.

c. Fuel recycle - The assumed fuel burnup at time of discharge, in megawatt-days per metric ton of initially contained fissile and fertile material, for each type of fuel is needed. For each type of new fuel, the quantities of each fissile or fertile isotope recoverable from the spent fuel removed from the reactors should be estimated.

d. Other core components - for different types of components and each element.

3. For the components (other than those covered in 2) in the primary coolant system, radioactive waste treatment system, reactor shielding, and other systems that are expected to be sufficiently radioactive at the termination of operation (and terminal decontamination) that use or possession would require a specific AEC license:

a. Each type of component should be identified.

b. Any material constitutents and quantities in metric units (Identification of metals by specific alloy type is preferable) should be presented. Quantities less than 100 metric tons of steel not containing materials on the list of strategic and critical materials, 37F.R.4123, February 26, 1972, should be neglected.

c. State whether it is expected that each type of component could be decontaminated.

4. All minerals used in the plant (other than those covered by 2 or 3 which are either (a) usually reclaimed, (b) precious metals, (c) strategic and critical materials stockpiled in the U.S., or (d) generally known to have small natural reserves should be identified. The total inventory or cumulative quantity of each material, the quantity that is expected to be reclaimed, and the quantity that will be unrecoverable, in metric units should be presented.

VI. NEED FOR POWER

1. The dates and duration of emergency load reductions, percent installed reserves, and date of peak load day for calendar years 1968 through 1972 should be provided.

2. The following table for the individual generating station capability for your total system should be completed.

Unit Name	Location	Type	Date Installed	Dependable Capacity (KW) Summer	Winter

3. A generation and capacity forecast for the years 1972 through 1981 should be supplied by completing the following table:

	Addition (or retirement)[a]				Total	Installed generation reserv	
Year	Net Unit load (MW)	Date	Unit capacity (MW)	Net generating capacity[b] (MW)	Megawatts	Percent	Percent without IP-3

[a] Include firm power purchases.

[b] Based on summer capability.

4. The attached table entitled "Values for Peak Demand Hour" should be completed.

5. A tabulation of consumption of electricity in the applicant's service area by user classification (residential, commercial and industrial, other) for 1960 and 1970 plus projections for 1975 and 1980 should be provided.

6. Copies of the last five annual reports of the company need to be furnished.

7. A map showing the applicant's generation and transmission facilities including interconnections with adjacent utilities should be supplied.

_____
(Applicant)

VALUES for PEAK DEMAND HOUR

YEAR	HYDRO CAPACITY	FOSSIL CAPACITY	GAS TURBINE CAPACITY	OTHER CAPACITY	NUCLEAR CAPACITY	NET PURCHASES	TOTAL SYSTEM CAPACITY	PEAK LOAD DEMAND	ORNL PREDICTED DEMAND	APPLICANT PREDICTED DEMAND	REMARKS
1961											
1962											
1963											
1964											
1965											
1966											
1967											
1968											
1969											
1970											
1971											
1972											
1973											
1974											
1975											
1976											
1977											
1978											
1979											
1980											

VII. ALTERNATIVES

1. If possible, the cooling tower proposed as an alternate cooling method for Unit No. 2 should be described, giving design and operating data, location, estimated cost, blowdown rate, flow rates, chlorination rates, and inventory of water in the basin. Is the tower a counterflow or crossflow type?

2. A description of water usage of each alternate cooling system should be presented. This should include the anticipated blowdown rates for the tower and the minimum values of dilution required for these blowdown rates.

3. An estimate of the type of chemical treatment which might be necessary for any alternate cooling modes should be given. This should include the amounts, frequency of usage and the concentrations anticipated. If the concentration of chemicals in the blowdown are different than the concentration of chemicals in the circulating water, what values are anticipated?

4. The tower exit air areas on the natural-draft and on the mechanical-draft cooling towers proposed as an alternate should be estimated.

5. The mean exit temperature and velocity of the cooling tower plume for the natural draft tower and the proposed design conditions also should be presented. How do these values vary with respect to the ambient wet bulb temperature and the relative humidity?

6. Would an alternate natural draft tower for Unit. No. 3 be a counterflow or crossflow type?

7. What would the maximum anticipated salt concentration be in the circulating cooling water using the alternate natural draft cooling tower arrangements for Units Nos. 2 and 3?

8. The applicability of regulating the depth of the intake structures for cooling towers such that the intake of highly saline water might be avoided should be evaluated.

9. What is the natural salt deposition in the Indian Point area?

10. Salt deposition from <u>all</u> alternative cooling modes in terms of drift deposition as affected by variations in local topography should be presented.

11. The effects of salt deposition from cooling tower alternatives upon local residential and industrial properties should be discussed further.

12. Information on the approximate rates of natural salt deposition over the site area in lb/acre/year is required.

13. Additional information is necessary on noise levels which might exist at different distances from the site during operation of:

    a. Indian Point No. 3 (proposed alternate cooling mode).

    b. Indian Point Units Nos. 1, 2, and 3 (proposed alternate cooling modes).

    What possible environmental effects may result from these noise levels?

14. Noise levels and environmental impact for the following cases need further explanation.

    a. Indian Point No. 3 with mechanical draft cooling towers.

    b. Indian Point No. 3 with mechanical draft cooling towers + noise levels from Units Nos. 1 and 2 (once-through cooling).

    c. Indian Point Units Nos. 2 and 3 with mechanical draft towers + noise level from Unit No. 1 (once through).

VIII. BENEFIT-COST ANALYSIS

1. The size of the operating force expected for Unit No. 3 should be estimated.

2. The expected total annual salary that will be paid to the Unit No. 3 operating personnel should be provided.

3. A breakdown of expenditures to date on Unit No. 3 should also be furnished.

4. Has a standard 40-hour work week been used during construction work to date?

5. What escalation rate(s) has been used during construction?

6. The exact date when the nuclear steam supply was ordered should be stated.

7. What cost of land was assumed in arriving at the total capital cost for Unit No. 3?

8. A new page B.1.4-1 in the Benefit-Cost Analysis should be furnished.

9. On p. B.2.1-1, line 9 of the Benefit Cost Analysis, the applicant used a discount rate of 9.75%. In order to achieve consistency of treatment in environmental statements, a discount rate of 8.75% is to be employed.

10. In reference to page 1.3-1 to 6, diagrams and maps illustrating the isotherms and cross sectional areas in relation to the total width and depth of the river in addition to detailed configurations are necessary.

11. On page 1.1-2 and associated text, the total weight of fish lost should be that of the number of adult fish. This procedure is stipulated in the AEC cost-benefit guide of May 1972. The resulting changes in the values given in Tables 1.1-1 and in 1.1-2 would be in orders of magnitude. These values thus need to be reevaluated. Even though total survival will not occur in nature, it should be possible to make a reasonable estimate of what the actual loss will be in terms of harvestable fish.

12. On page 1.1-2, based on the weight of other species in the table provided ranging from 1/20 to 1/5 of an ounce, the number of fish impinged becomes 55,000 to 220,000 fish rather than the 10,813 cited. This should be clarified. In reference to page 1.2-2, documentation for the method of extrapolating the weight of food organisms to the weight of fish is needed. Based on conversion factors between tropic levels of 1/10 which is normally used rather than 1/1000, the loss of fish calculated from loss of food organisms could be at least one order of magnitude greater than the applicant's estimate. This discrepancy needs clarification.

13. On page 1.2-3.4-5 although entrainment losses of juvenile and larval fish are discussed, no estimates of what the losses would be. This information is required because of the importance of this environmental cost of the facility. In addition there should also be information concerning losses of fish eggs.

14. On page 1.3-9 section on fish migration the applicant's allegations of no impairment to fish migration needs far more support than presented here. Details for each significant species along with illustrative maps or diagrams should be presented.

15. On page 1.4-2, it is not clear whether the dilution factor includes river flow of receiving waters. If this is the case, it assumes perfect and instantaneous mixing. An explanation of the mixing of effluents is needed.

16. The conclusions which were reached as a result of the benefit-cost analysis presented in Section 22.0 of the Environmental Report and the Supplements, are required.