

APPENDIX B

TO

FACILITY OPERATING LICENSE DPR-26

FOR

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

INDIAN POINT NUCLEAR GENERATING PLANT UNIT NO. 2

DOCKET NO. 50-247

ENVIRONMENTAL TECHNICAL SPECIFICATION REQUIREMENTS

FOR TESTING UP TO 50% POWER

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ENVIRONMENTAL TECHNICAL SPECIFICATIONS

1

DEFINITIONS

The following used term is defined for uniform interpretation of the environmental Technical Specifications.

Abnormal Environmental Occurrence

An abnormal environmental occurrence means the occurrence of any plant condition that results in an environmental technical specification limit being exceeded.

Applicability

Applies to the release of non-radioactive liquids, gases and solids from the site.

Objective

To define the conditions for release of non-radioactive liquids and solids to the river and gases to the atmosphere to assure compliance with appropriate federal, state and local regulations.

Specification

A. Liquid Effluents

1. The maximum release concentrations of chemicals in the discharge canal prior to entry into the river (i.e., at the confluence) shall be as specified in Table 2-1.
2. The maximum frequency of chlorination for each unit shall be limited to three times per week. The total time for the chlorination treatment for both Units 1 and 2 shall not exceed 6 hours per week. Chlorination shall normally be limited to one hour during each treatment except for special tests. (Chlorination will take place during daylight hours except during special testing).

3. The thermal discharges during operation shall be limited so as not to exceed the New York State thermal criteria. (6NYCRR §704)

B. Gaseous Effluents

The release of sulfur dioxide in combustion products from the package boilers will be limited through the use of fuel oil in compliance with appropriate federal, state and local regulations.

C. Solid Effluents

Solid wastes collected from the travelling screens will be disposed of as trash in accordance with local regulations; except that fish collected together with non-separable trash will be returned promptly to the river. (This does not apply to fish collected for the purpose of testing or analysis of fish).

TABLE 2-1

MAXIMUM RELEASE CONCENTRATION OF CHEMICALS AT
THE CONFLUENCE OF THE DISCHARGE CANAL AND THE RIVER

<u>Chemical</u>	<u>Concentration (ppm)</u>
Phosphate	1.5
Hydrazine	0.1
Cyclohexylamine	0.1
Lithium Hydroxide	0.01
Boric Acid	50
Potassium Chromate	0.05 (hexavalent chromium)
Residual Chlorine (free and combined)	0.5
Sodium Hydroxide	10
Sulfuric Acid	10
Soda Ash	5

BASIS

Chemical releases from Unit No. 2 are subject to the same dilution in the circulating water system discharge prior to releases into the river as are radioactive effluents. Of special concern ecologically is the potential damage to river organisms from exposure to chlorine residuals, including chloramines, during and after the periodic chlorination of the circulating water system. A limit on chlorine residual and other chemicals at the point of confluence and limits on frequency of chlorination should provide added assurance that the chlorination program for and chemical discharges from Indian Point Units 1 and 2 will not cause significant damage to the ecosystem of the Hudson River.

The thermal discharges shall be limited in that the excess temperature isotherms above ambient shall be within the New York State thermal criteria at all power levels and shall be maintained at all times to adequately protect biota exposed to excess temperatures. Mathematical and physical modeling of the thermal discharge from Indian Point has indicated that operation of Units 1 and 2 at full power will meet applicable New York State thermal discharge criteria and, therefore, operation of Unit No. 2 at 50% of full power will also meet the discharge criteria. The licensee's testing program should verify this modeling of the thermal discharge from Indian Point at 50% of full power.

Incorporated as part of the circulating water system for Unit No. 2 are travelling screens which prevent solid waste material from being drawn from the river into the system and thereby cause damage to equipment such as the circulating water pumps. The requirement to cart away this solid waste rather than dumping it back into the river from whence it came is consistent with the licensee's commitment to protect the environment.

Experience has shown that fish impingement can be expected to occur on the fixed screens and these fish are collected on the travelling screens. As part of the licensee's efforts to minimize the effect of impingement and any related fish mortality, a fish pump has been installed. This pump will return the impinged fish to the river. In so doing, the pump will also pump back to the river some non-separable solid wastes. The specification permitting this pump back of some non-separable solid wastes with impinged fish will assist in the reduction of fish mortality.

Applicability

Applies to the mode of operation of the circulating water system.

Objective

To define the limiting conditions of operation of the circulating water system.

Specification

A. Intake Velocity

1. The withdrawal of cooling water from the Hudson River shall be maintained so that the average intake flow velocity of the water approaching the outer screens (at a distance of 24 inches in front of the screens) of the intake structure is one (1) foot per second or less.
2. When the ambient river temperature is less than 40°F, the average intake flow velocity shall be reduced to approximately 60% of the maximum full-flow condition.

B. Dissolved Oxygen

When the ambient river concentration of dissolved oxygen is below 5.0 ppm, the maximum decrease in concentration of dissolved oxygen, at the confluence of the discharge canal and the river, shall not be more than 0.5 ppm.

When the ambient river concentration of dissolved oxygen is 5.0 ppm or above, the maximum decrease in concentration of dissolved oxygen shall be limited so that the effluent level of dissolved oxygen will not be less than 4.5 ppm.

C. Discharge Velocity

The adjustable ports in the outfall structure shall be adjusted such that the minimum discharge velocity is approximately 10 ft/sec (except during testing of the structure or the circulating water system).

The position of each gate and total coolant flow will be recorded after each change.

The adjustment in the ports is to be made within 8 hours of any change in the steady-state flow in the discharge canal.

The withdrawal of cooling water from the Hudson River through the outer protective screens, travelling screens and the once-through condenser system may cause damage to aquatic biota by impingement on the screens. Fish collections have been experienced at the Indian Point Unit No. 1 intake ports and at Unit No. 2 during testing of the circulating water pumps. Information indicates that by maintaining the intake velocity at one (1) foot per second (fps) or less, this problem should be significantly reduced.

By design, the velocity approaching the outer screens of the intake structure is less than 1 foot per second. When river ambient temperatures are less than 40°F, Unit No. 2 will be operated with the cooling water flow reduced to approximately 60% of full flow. Flow reduction will be accomplished with recirculation loops installed on the discharge side of the pumps which return approximately 40% of the pump flow back to the intake bay. Thus, the velocity of water approaching the outer fixed screens will be reduced to approximately 0.5 feet per second.

Dissolved oxygen concentrations of the circulating cooling water will be measured to note any changes from operation of Unit No. 2. Any reduction in dissolved oxygen could also be harmful to certain aquatic life during periods when the dissolved oxygen levels are low as a result of natural occurrence. If there is an oxygen reduction greater than 0.5 ppm caused by

operation of Unit No. 2, steps should be taken to minimize this reduction when ambient D.O. levels are less than 5 ppm.

The average dissolved oxygen is about 6 to 7 ppm, but varies seasonally from about 3 or 4 to 10 or 11 ppm.

During testing up to 50% of rated power, the licensee will conduct a testing program using different circulating water pump combinations and thermal discharges through the modified multipoint discharge structure using the closed adjustable gates to maintain the minimum discharge velocity at approximately 10 fps. Maintaining the velocity to 10 feet per second gives added assurance that the applicable New York State thermal criteria will be met.

Applicability

Applies to routine testing of the plant effluents and to an analytical evaluation of the data collected from the non-radiological environmental monitoring survey.

Objective

To establish a sampling schedule which will assure that liquid effluent releases are kept within allowable federal, state and local limits.

Specification

The survey for liquid effluents shall be conducted in accordance with Table 4-1.

REGULAR EFFLUENT MONITORING STUDY

<u>Parameter Analyzed for</u>	<u>Collection and Analyses Frequency</u>
Phosphate (Orthophosphate)	WK
Hydrazine	MO
Cyanide	MO
pH	WK
Boron	WK
Chromium (Hexavalent)	MO
Residual Chlorine (free and combined)	D
Chlorine Demand	MO
Specific Conductance	WK
Turbidity	WK
Dissolved Oxygen	WK
Temperature Rise (ΔT in $^{\circ}F$)	Continuous

TABLE 4-1
(Continued)

NOTES

1. All parameters except chlorine demand to be sampled at the plant intake and at the confluence with the Hudson River.
2. WA (weekly), MO (monthly), D (during discharge)
3. All samples shall be taken and analyzed in accordance with approved standard methods.

Approved standard methods are published by: (1) the American Society for Testing and Materials in the "Annual Book of ASTM Standards, Part 23, Water: Atmospheric Analysis" and (2) the American Public Health Association, the American Water Works Association and the Water Pollution Control Federation in the book "Standard Methods for the Examination for Water and Waste Water". In cases where: (a) the existing standards are not applicable; (b) conflicts exist between standards; (c) no standards exist; or (d) newer technology outdates existing standards, an evaluation will be made by Con Edison in light of the latest technology as to the applicable standard method to be used.

4. Lithium Hydroxide, Sodium Hydroxide, Sulfuric Acid and Soda Ash will be determined by monitoring pH.

BASIS

This liquid effluent monitoring program for Indian Point is designed to monitor areas where non-radiological effects on the environment could occur. These programs are designed to demonstrate that the plant is being operated in accordance with these environmental Technical Specifications with respect to thermal and chemical discharges and water quality changes in dissolved oxygen and other parameters.

Administrative controls will be such that all releases shall be required to meet all applicable Federal, State and Local regulations at all times. The non-radiological liquid effluent monitoring program of the releases provides a means of ensuring that the releases will be within these regulations. The Licensee's commitment to meet these standards and to implement changes in the operation of the plant that will minimize damage to the biota as indicated through the liquid effluent monitoring program will assure adequate protection of the ecosystem of the Hudson River.

Applicability.

Applies to the reporting and evaluation of data on collection of fish at the intake screens of Unit No. 2.

Objective

To establish a schedule for immediate reporting of data on fish collected at the intake screens of Unit No. 2 in order to enable determinations to be made in accordance with the objectives of 10CFR50, Appendix D, of the need and the means for corrective actions to reduce the numbers of fish collected.

Specification

- A. Reports of each collection shall be made by telephone or telegraph on the day collections are made, to the Director of Regulatory Operations, Region I, of the data on number, size and species of fish collected at the Unit No. 2 intake screens.
- B. No less often than once every 90 days, the environmental significance of these and other plant operating data will be jointly evaluated by Con Edison and the AEC Regulatory Staff.

BASIS

There are presently insufficient data available to determine the environmental significance of collections of fish at the Unit No. 2 intake screens. Those studies described in Section 6 of these environmental Technical Specifications are intended to provide such data. Pending development of this information, Specification 5A provides a mechanism for the AEC's Regulatory Staff to be kept currently advised of the numbers of fish being collected daily at the intake screens so that immediate determinations can be made whether measures to reduce these numbers should be instituted.

The baseline, (i.e, fish collected per day) provided by Specification 5A will aid in the development of interim operational procedures and corrective actions to taken in order to minimize the Station's impact on the fisheries resource.

Introduction

These additional administrative controls relate to additional management procedures, record keeping and reporting that are considered necessary to provide the assurance and evidence that the plant will be managed as prescribed by the environmental Technical Specifications.

These administrative controls specify the administrative tools necessary to assure operation of the plant such that adverse effects on the environment will be minimized. They also define the administrative action to be taken in the event operating limits are exceeded.

Specification

A. Additional Plant Operating Procedures

1. Detailed written procedures with appropriate checkoff lists and instructions shall be provided for the following:

- a. Positioning of outfall gates to maintain a discharge velocity through the submerged ports of approximately 10 ft/sec.

2. If the Station Manager desires to make a change in the additional operating procedures (as called for in Specification A.1 above), which in his opinion might involve a change in the additional environmental Technical Specifications (Appendix B) or might otherwise not be in accordance with said license, he shall not order such a change without prior approval of the Atomic Energy Commission.

B. Action to be Taken in the Event of an Abnormal Environmental Occurrence

1. Any abnormal environmental occurrence shall be promptly investigated by the Station Manager.
2. The Station Manager shall promptly notify the Manager of the Nuclear Power Generation Department of any abnormal environmental occurrence.
3. The Station Manager shall prepare and submit promptly a report in writing to the Manager of the Nuclear Power Generation Department following the observation of an abnormal environmental occurrence. Such report shall describe the circumstances leading up to, and resulting from the occurrence; and shall recommend appropriate action to prevent or reduce the probability of a repetition of occurrence.
4. The Vice President of Power Supply shall report the circumstances of any abnormal environmental occurrence

to the AEC as specified in Section 6.C, "Additional Plant Reporting Requirements".

C. Additional Plant Reporting Requirements

In addition to reports required by applicable regulations, the following information shall be provided to the Atomic Energy Commission:

1. Events requiring notification within 24 hours (by telephone and telegraph) to the Director of Regulatory Operations, Region 1, followed by a written report within 10 days to the Director, Directorate of Licensing, USAEC, Washington, D. C. 20545; with a copy to the Director of Regulatory Operations, Region 1:
 - a. Abnormal Environmental Occurrences as Specified in Section 1

The written report, and to the extent possible the preliminary telephone or telegraph report, shall describe, analyze and evaluate environmental effect and outline the corrective actions and measures taken or planned to prevent recurrence of a. above.

2. A Semi-Annual Station Operations Report shall be prepared and submitted to the Director, Directorate of Licensing, USAEC, Washington, D. C. 20545 within 60 days after the

end of each reporting period in accordance with the additional requirements of Appendix B to said license.

The report shall provide the following information (summarized on a monthly basis) and shall cover the six-month period or fraction thereof, ending June 30 and December 31. The due date for the first report shall be calculated from the date of initial criticality.

a. Non-Radioactive Effluent Releases

Information relative to the quantities of liquid, gaseous and solid non-radioactive effluents released from the plant and the effluent volumes used in maintaining the releases within the limits of appropriate federal, state and local regulations shall be provided as follows:

1) Chlorination of Cooling Water

- a) Dates and times at which chlorination was performed.
- b) Amount of sodium hypochlorite consumed during each chlorination.
- c) Feed rate.
- d) Concentration of sodium hypochlorite used.
- e) Analytical results of chlorine tests.
- f) Cooling water flow rate during chlorination.

2) Chemical Discharges and Water Quality

a) Dates and times at which samples were taken and analyzed in accordance with Table 4-1.

b) Analytical results of tests performed in accordance with Table 4-1.

3) Thermal Discharges

a) Total thermal energy in BTU released through the discharge outfall.

b) Maximum and average release rate of energy through the discharge outfall in BTU per hour.

c) Data on continuous temperature measurements at the inlet and outlet of the condensers and the excess temperature above ambient upon discharge into the river.

4) Gaseous Discharges

a) Amount of fuel oil consumed in the package boilers.

b) Percent sulfur in fuel oil consumed.

5) Solid Wastes

a) Amount of non-radioactive solid waste material collected (in cubic feet) and disposed of as solid waste in accordance with local regulations.

b. Operation of the Circulating Water System

1) Number of pumps operating and dates of operation.

- 2) Flow rate per pump, specifically indicating the dates when reduced flow takes place.
- 3) Calculated intake velocity approaching outer screens for each pump as noted in b. above (based upon measured flow per pump) and measured head loss across the outer fixed screens.
- 4) Number of fish collected on the intake screens.

3. Additional Special Reports

Reports covering the following subjects shall be submitted to the Director, Directorate of Licensing, USAEC, Washington, D. C. 20545, within 90 days of completion of the study. In addition, for those studies not completed, a semi-annual progress report will be submitted..

- a. Effects of chlorine and other chemical discharges on the ecosystem of the Hudson River.
- b. Ecological effects of thermal discharges.
- c. Potential reduction in dissolved oxygen through the plant.
- d. Ecological effects of fish impingement.
- e. Ecological effects of entrainment of organisms.
- f. Thermal plume model verification and mapping (near and far field).

- g. Effects of reduction in frequency of chlorination and concentration of free and combined chlorine on plant operation.
- h. An assessment of performance of fish pumps as installed.
- i. Evaluation of head loss across the fixed intake screens as a function of velocity through the screens and fish collected.

BASIS

Studies relating to ecological effects from chlorine and other chemical discharges, thermal discharges, reduction in dissolved oxygen, impingement of fish and entrainment of organisms will be initiated as soon as mechanical, electrical and radiological testing schedules permit, and will continue with issuance of the license to test up to 50% of rated power. Several of these studies are long-term in nature (up to five years) and although started at the time of the 50% testing license, they will not be completed at the time the plant is ready to be taken up to 100% power. Thermal discharge monitoring at the intake-discharge system will consist of continuous measurements once power is initiated and flow characteristics measurements will begin before issuance of the license to test up to 50% of rated power. The thermal discharge monitoring measurements taken while at 50% of rated power shall be used to show compliance with the New York State thermal criteria.

A study to evaluate the biological changes in the Hudson River ecosystem due to thermal and chemical discharge will be accomplished by a biological survey of all aquatic organisms, physical and chemical measurements at the Indian Point area compared with control regions and determining species diversity and biomass per area in each region. This study is expected to be completed by the first half of 1976.

A study to evaluate the biological significance of impinging fish at the intakes will be accomplished by estimating population density, natural mortality, age distribution of the population, food habits, movements and migration routes, growth rates, exploitation rate on the screens, and measuring head differential across the screens. These estimates will be made by mark-recapture procedures, aging of the population, etc. from the Haverstraw Bay area to the Beacon Bridge by collecting fish with trawls, seines, fish traps, gill nets, etc. The measurement of heat differential will be taken across a typical fixed intake screen installation. This study is expected to be completed by the end of 1975.

A study to evaluate the biological significance of passing non-screenable organisms through the plant will be accomplished by determining the mortality rate of all nonscreenable organisms passing through the plants and predicting the biological significance of such a mortality rate on the Hudson River fishery. This study is expected to be completed by the end of 1973.

A study will be undertaken to develop a monitoring system for use after the initial five-year study to detect changes in the biology of the river. This monitoring system will determine the continuing applicability of the result of the initial five-year study. This will be accomplished by testing sampling methods, frequency, locations and duration.

The expected completion dates stated above are based upon achieving expected combinations of plant operating parameters coincident with seasonal conditions and species availability.

Further, although the phenomenology associated with the ecological parameters being studied is fairly well known, quantification of the various parameters could conceivably indicate further study as being desirable. The licensee, therefore, has the flexibility of making schedule changes in the various studies being undertaken as becomes necessary. The semi-annual progress reports will afford a means of notification of such schedule changes, should they occur.

During 50% testing operation, river temperature data will be obtained for verification of physical and mathematical thermal modeling of 50% plant operation during the testing period. This will require a period of steady-state operation at 50% of full power beyond the period of testing already required as part of the normal startup testing program as defined in the FSAR.

The non-radiological monitoring on impingement of fish and entrainment of organisms will be conducted until such time as sufficient data has been obtained to permit an evaluation of the short-term and long-term significance of the impact on biota from plant operation. This criteria also applies to monitoring studies on chlorine and other chemical discharges, reduction of dissolved oxygen and thermal effects to assure that steps can be taken in advance of any possible irreversible damage done to the environment. The data collected as part of the study of the ecological effects of fish impingement will be used to develop baselines for future operational limits.