UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

Docket Nos. 50-3
and 50-247

DEC 1 0 1975

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

Gentlemen:

In response to your request dated August 29, 1975, we have issued Amendment No. 11 to Provisional Operating License No. DPR-5 for Indian Point Generating Unit No. 1 and Amendment No.15 to Facility Operating License No. DPR-26 for Indian Point Nuclear Generating Unit No. 2. These amendments include Changes Nos.67 and 12 to the Appendix B Environmental Technical Specifications for Units Nos. 1 and 2, respectively.

These amendments involve administrative changes in reporting requirements to be consistent with NRC guidelines. The reporting requirements in Appendix B have been separated from those required for Appendix A Technical Specifications and involve in certain cases semiannual and in others, annual reporting. Editorial corrections and changes resulting from the reorganization to form NRC from the former Atomic Energy Commission have also been made.

There will be no change in effluent types or total amounts released, and the amendments will not result in any significant environmental impact. There will be no increase in power level. We have concluded, therefore, pursuant to 10 CFR 51.5d(4), that an environmental statement, negative declaration or environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

The amendments address only administrative changes and do not involve new safety information of a type not considered by a previous Commission safety review of the facility. They do not involve significant increase in the probability or consequences of an accident, do not involve significant decrease in a safety margin and, therefore, do not involve a significant hazards consideration. We have also concluded that there is reasonable assurance (1) that the health and safety of the public will

Conf

not be endangered by the proposed action, and (2) that such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or the health and safety of the public.

These amendments and the associated pages to the Appendix B Environmental Technical Specifications are enclosed together with the related Federal Register Notice.

Sincerely,

Original signed by Daniel R. Muller

Daniel R. Muller, Assistant Director
for Environmental Projects
Division of Reactor Licensing

Enclosures:
1. Amendment No. // to DPR-5
2. Amendment No. 15 to DPR-26
3. Federal Register Notice

cc w/Enclosures: See next page
SEE 50-3 for Enclosure.

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

DOCKET NO. 50-3

INDIAN POINT NUCLEAR GENERATING UNIT NO. 1

AMENDMENT TO PROVISIONAL OPERATING LICENSE

Amendment No. 11
License No. DPR-5

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Consolidated Edison Company of New York, Inc., for Indian Point Nuclear Generating Unit No. 1, dated August 29, 1975, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended, (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 3.B. of License No. DPR-5 is hereby amended to read as follows:

"(B). Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. 67 ."

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Daniel R. Muller

Daniel R. Muller, Assistant Director
for Environmental Projects
Division of Reactor Licensing

Attachment:
Change No. 67
to Technical Specifications

Date of Issuance: DEC 16 1975

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

DOCKET NO. 50-247

INDIAN POINT NUCLEAR GENERATING UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 15
License No. DPR-26

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Consolidated Edison Company of New York, Inc., for Indian Point Nuclear Generating Unit No. 2, dated August 29, 1975, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended, (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 2.C.(2) of License No. DPR-26 is hereby amended to read as follows:

"(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. 12."

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Daniel R. Muller

Daniel R. Muller, Assistant Director
for Environmental Projects
Division of Reactor Licensing

Attachment:
Change No. 12
to Technical Specifications

Date of Issuance: DEC 18 1975

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NOS. 50-3 AND 50-247

INDIAN POINT NUCLEAR GENERATING UNITS NOS. 1 AND 2

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

NOTICE OF ISSUANCE OF LICENSE AMENDMENTS

Notice is hereby given that the U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 11 to Provisional Operating License No. DPR-5 for Indian Point Nuclear Generating Unit No. 1, and Amendment No. 15 to Facility Operating License No. DPR-26 for Indian Point Nuclear Generating Unit No. 2, to Consolidated Edison Company of New York, Inc. Both units are located in Westchester County, State of New York. The amendments are effective as of their date of issuance.

The amendments involve administrative changes in reporting requirements to be consistent with NRC guidelines. The reporting requirements in Appendix B have been separated from those required for Appendix A Technical Specifications and involve, in some cases, semi-annual reporting and, in others, annual reporting. Editorial corrections and changes resulting from the reorganization which created the Nuclear Regulatory Commission have also been made.

The application for amendments complies with the standards and requirements of the Atomic Energy Act of 1954, as amended, (the Act), and the Commission's rules and regulations. The Commission has made

appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendments. Prior public notice of these amendments is not required since the amendments do not involve significant hazards considerations.

Since there will be no change in effluent types or total amounts nor an increase in power level and will not result in any significant impact, we have concluded, pursuant to 10 CFR 51.5(d)(4), that an environmental statement, negative declaration or environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

For further details with respect to these actions, see: (1) the application for the amendments dated August 29, 1975; (2) Amendment No. 11 to License No. DPR-5 with its attachment, Change No. 67 , and (3) Amendment No. 15 to License No. DPR-26 with its attachment, Change No. 12 .

All of the above items are available for public inspection at the Commission's Public Document Room, 1717 H Street, NW., Washington, D. C. 20555, and at the Hendrick Hudson Free Library, 31 Albany Post Road, Montrose, New York 10548. Copies are also being made available at the New York State Office of Planning Services, 488 Broadway, Albany, New York 12207, and the Tri-State Regional Planning Commission, 100 Church Street, New York, New York 10007.

A copy of items (2) and (3) may be obtained upon request addressed to the United States Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Acting Director, Division of Reactor Licensing.

Dated at Rockville, Maryland, this 16th day of December 1975.

FOR THE NUCLEAR REGULATORY COMMISSION

George W. Knighton

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

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 11 TO PROVISIONAL OPERATING LICENSE
NO. DPR-5 CHANGE NO. 67 TO TECHNICAL SPECIFICATIONS;

AMENDMENT NO. 15 TO FACILITY OPERATING LICENSE
NO. DPR-26 CHANGE NO. 12 TO TECHNICAL SPECIFICATIONS

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

INDIAN POINT NUCLEAR GENERATING UNITS NOS. 1 AND 2

DOCKET NOS. 50-3 AND 50-247

Revise Appendix B as follows:

Remove pages 1-1, 2-2, 2-3, 2-4, 2-7, 2-8, 2-9, 2-10, 2-11, 2-14, 2-15, 2-16, 2-17, 2-18, 2-19, 2-22, 2-25, 2-28, 2-29, 2-30, 2-35, 2-38, 4-3, 4-8, 4-10, 4-13, 4-14, 4-24, 4-28, 4-31, 4-32, 4-36, 4-37, 4-39, 4-42, 4-52, 4-54, 4-63, 4-64, 4-66, 5-2, 5-3, 5-4, 5-5, 5-6, 5-7, 5-7, 5-9, 5-10, 5-11

Insert pages 1-1, 2-2, 2-3, 2-4, 2-7, 2-8, 2-9, 2-10, 2-11, 2-14, 2-15, 2-16, 2-17, 2-18, 2-19, 2-22, 2-25, 2-28, 2-29, 2-30, 2-35, 2-38, 4-3, 4-8, 4-10, 4-13, 4-14, 4-24, 4-28, 4-31, 4-32, 4-36, 4-37, 4-39, 4-42, 4-52, 4-54, 4-63, 4-64, 4-66, 5-2, 5-3, 5-4, 5-5, 5-6, 5-7, 5-8, 5-9, 5-10, 5-11, 5-12, 5-13, 5-14, 5-15, 5-16

1.0 Definitions

The following terms are defined for uniform interpretation of the Environmental Technical Specifications for Indian Point Unit Nos. 1 and 2.

1.1 Hudson River estuary - the tidal portion of the Hudson River from the Battery up to Troy Dam resulting from the influence of the Atlantic Ocean.

1.2 Nonroutine Reportable Environmental Occurrence

A nonroutine reportable environmental occurence of any plant condition that:

1.2.1 Results in noncompliance with, and is in violation of, an environmental technical specification and causes an abnormal degradation of the environment, and

1.2.2 Exceeds a Limiting Condition for Operation as established in the Environmental Technical Specifications, or

1.2.3 Causes any uncontrolled or unplanned releases of chemical, radioactive, and thermal or other discharges from the site in excess of applicable Federal and State regulations.

1.3 Emergency Conditions

1.3.1 Reactor Emergency - shall mean an unanticipated equipment malfunction necessitating prompt remedial action to avoid endangering the public health and welfare.

1.4 Temperature Considerations

1.4.1 Circulating water system includes the intake openings and structure for all units, the condenser cooling water system, the discharge canal, discharge port and structure.

1.4.2 Intake Water Temperature - refers to water temperature measured in the intake structure forebay in the inlet to the circulating water system.

1.4.3 Discharge Canal Water Temperature - refers to water temperature measured in the discharge canal, at or near the confluence of the discharge canal with the Hudson River.

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2.1.1 Maximum ΔT Across Condensers

Objective

Limit the maximum temperature rise across the condensers during normal operation at all power levels.

Specification

A. The maximum temperature rise across the condensers shall not exceed:

(1) 25F° at reduced flow whenever the intake water temperature is less than 40°F;

(2) 15F° whenever the plant is operating at full flow and 25F° at reduced flow with recirculation.

Thermal discharges at reduced flow as well as full flow during the summertime shall be limited to comply at all times with the New York State Thermal Criteria as presented in Section 4.1.1.a.

B. At reduced flow, the maximum temperature rise across the condensers shall not exceed 28F° during times when one or more circulating water pumps are down for maintenance.

3.1.1 Maximum ΔT Across the Condensers

Objective

To monitor the intake and discharge temperatures at all power levels to assure that the allowable ΔT across the condensers is not exceeded.

Specification

The site river water temperature in front of the intake structure shall be measured continuously by means of at least one temperature element located at a depth of about 13 feet below mean low water at the edge of the dock, about 65 feet in front of the Unit No. 1 intake structure. The intake water temperature along with the discharge canal water temperature shall both be monitored and recorded continuously. The former shall be measured at a depth representative of the average intake temperature in the forebay of Unit No. 2 intake. The latter shall be obtained by means of a probe located in the discharge canal before the confluence with the river, at depth of 5.5 feet below mean low water (see Figure 2-1 for location of probes). The accuracy of the temperature sensors shall be ± 0.5°F. A strip chart record shall be kept for examination and that daily minimum, maximum and average

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Date: DEC 16 1975

Specification (Cont'd)

C. The maximum temperature rise across the condensers shall not exceed 28F° whenever ten percent of the normal condenser discharge is recirculated to the inlet for ice control during deicing operations, or 34F° whenever 20% of the normal condenser discharge is recirculated to the inlet for ice control during deicing operations.

D. Whenever the temperature increment (ΔT) is above the specified limits for more than one hour, action shall be taken to determine the reason for the temperature increase and its expected duration, and corrective action shall be taken to reduce the ΔT to within the specified limits. These occurrences shall be recorded and reported in accordance with the Plant Reporting Requirements in Section 5.6. 2.1.b. | 67

Specification (Cont'd)

values be reported. The continuous temperature recorder shall not be inoperative for a period exceeding 14 days. As an alternate during the system downtime for calibration or repairs, the temperature readings in front of the intake structure and in the discharge canal shall be obtained locally four (4) times a day. A temporary method of temperature measurements will be permitted up to May 1, 1974. These include a temporary local readout at the screenhouse for Unit No. 2 and at the location for the discharge canal temperature sensor as shown in Figure 2-1. Permanent RTD's with an accuracy of ± 0.5°F will be installed by May 1, 1974 and the temperature data will be readout on a strip chart recorder in the control room. An alarm in the control room indicates when the temperature differential has been exceeded. The monitoring requirements of this specification as well as those of Specifications 3.1.2, 3.1.3, and 3.1.4 shall be effective on May 1, 1974. In the interim period, intake water temperatures shall be monitored and continuously recorded locally by temperature probes. The accuracy of the temporary temperature probes shall be ± 1°F.

A continuous flow rate through the condensers shall be logged each day and any changes recorded at the time of changes.

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Specification (Cont'd)

Continuous temperature monitoring is required following changes in power level or during deicing operations until the ΔT across the condensers are stable. Operation at reduc(flow if carried out during the summertime shall be evaluated by the licensee by continuously measuring and recording information as to the heat load, the site river water temperature, the maximum ΔT across the condenser, the pumping capacities, the maximum surface temperature in the thermal plume and extent of 4F° isotherm as described in Section 4.1.1.a. and the measurements and results reported in the Annual Environmental Operating Report. Deviations from this monitoring program shall be promptly reported in accordance with Section 5.6.2.1.a.

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2.0 LIMITING CONDITIONS FOR OPERATION

Bases (Cont'd)

means of two 80,000 gpm pumps located adjacent to the discharge canal. Deicing on Unit No. 1 is attained by means of direct recirculation of a portion of the heated water from the outlet water box of the Unit No. 1 condenser. Primary use of the deicing operation occurs in December and January with intermittent operation from November through April.

.1.2 Maximum Discharge Temperature

Objective

To limit the maximum temperature of the condenser cooling water discharge through the discharge structure at the confluence with the river during normal operation.

Specification

During July through September, the discharge canal water shall not exceed 96°F during normal plant operation of the two units with all circulating pumps and service water pumps in full capacity flow. The maximum discharge temperature during full and reduced flow shall be limited such that the thermal discharges shall be maintained in accordance with the New York State thermal criteria presented in Section 4.1.1a.

3.0 MONITORING REQUIREMENTS

Bases (Cont'd)

All temperature measurements averaged over the day shall be reported in the Annual Environmental Operating Report. Operating conditions and temperature measurements during reduced flow shall also be reported in this document.

3.1.2 Maximum Discharge Temperature

Objective

To monitor the circulating water discharge temperature to assure that the allowable discharge temperature is not exceeded.

Specification

A mid-depth continuous temperature sensor will be used in the discharge canal. Temperatures at the discharge canal will also be transmitted to the control room. The temperatures will be visually displayed for monitoring purposes and recorded. The accuracy of the temporary temperature sensors is 1°F. When the system is not operative, an alternative backup system as presented in Section 3.1.1 will be used. See Section 4.1.1a for the monitoring of the thermal plume.

2.0 LIMITING CONDITIONS FOR OPERATION	3.0 MONITORING REQUIREMENTS
Specification (Cont'd) Deviation from the specifications shall be documented in accordance with the Plant Reporting requirements in Section 5.6.2.1.a. | 67	
Bases The analyses made by the licensee is based on the assumption that the maximum ambient temperature is 79°F and the maximum effect of recirculation, from the tidal influence of the estuary, on the intake temperature is 1.2F° temperature differential. Therefore; the maximum discharge canal water temperature should not exceed 95.2°F. An upper limit of 96°F of the discharge water at the discharge port is thereby being set. The thermal discharges shall also be maintained at all times to adequately protect aquatic biota against exposure to excess temperatures and to comply with the New York State Thermal Criteria presented in Section 4.1.1a.	Bases The placement of the temperature monitoring instrument in the discharge canal will give the temperature of the discharge water immediately before mixing with the receiving water. The placement of this temperature sensor at a 5.5 foot depth in the discharge canal will provide for temperature measurements representative of the discharge water before mixing with the receiving water.
.1.3 Maximum Heat Rejection Rate (Btu/hr)	3.1.3 Maximum Heat Rejection Rate (Btu/hr)
Objective Limit the maximum heat discharged with the heated coolant water into the Hudson River.	Objective Calculate the maximum heat rejection rate.

Change No.; 67
Date DEC 16 1975

2.0 LIMITING CONDITIONS FOR OPERATION

Specification

The maximum heat rejected into the river with the discharged heated coolant water shall not exceed as follows:

Unit No. 1	2.0×10^9 Btu/hr
Unit No. 2	6.5×10^9 Btu/hr
Unit Nos. 1 and 2	8.5×10^9 Btu/hr

The heat rejection rates shall be calculated in the equation

$$H = \rho Q_c \, C_p \, \Delta T_c \qquad (2\text{-}1)$$

where:

- H = heat rejection rate in Btu/hr
- Q_c = condensers cooling water flow in cu. ft/hr as described in Section 2.1.1.
- ΔT_c = temperature differential (F°) across the condensers as discussed in Section 2.1.1.
- ρ = water density, lbs/cu. ft
- C_p = specific heat of the water, Btu/lb/F°

3.0 MONITORING REQUIREMENTS

Specification

Monitoring and recording requirements include those specified in Section 3.1.1 for the monitoring of the ΔT_c across the condensers and the circulating water flow through each condenser in Section 3.1.3. The daily average heat output shall be reported in the Annual Environmental Operating Report. 67

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Bases

The maximum heat rejected is a fixed value based on the reactor core design, the primary and secondary coolant heat transfer system, and the spent steam temperature and volume as the steam reaches the condenser tubes.

2.1.4 Rate of Temperature Change of Condenser Cooling Water, ΔT

Objective

To limit the rate of temperature change during normal operation within the primary operating cycle, thereby limiting the temperature change of the condenser cooling discharge water.

Specification

The rate of temperature change in the discharge canal water during normal plant operation shall not exceed 15F° per hour, during normal power increase, and 7F° per hour during normal power reductions. If these rates are exceeded, appropriate corrective action shall be taken to avoid thermal or cold shock to aquatic life. This limitation may be exceeded for brief periods as necessary to maintain protection of critical plant equipment and systems and for certain safeguard operations which cannot be limited or regulated by plant operation. These

Bases

Calculation of the heat rejection rate to the river will be made for use in correlating the temperature of the thermal plume in Section 4.1.1.a.

3.1.4 Rate of Temperature Change of Condenser Cooling Water, ΔT

Objective

To regulate the rate of load change thereby limiting the temperature change of the condenser cooling discharge water to assure that the allowable rates of change are not exceeded for protection of biota.

Specification

Intake and discharge canal water temperatures shall be monitored continuously under 3.1.1. The time of the day and dates when the temperature changes greater than one-half the limits specified in 2.1.4 occur shall be recorded. Any rate of temperature greater than one-half of the limits specified in 2.1.4 shall be recorded and reported. Fish undergoing thermal stresses shall be observed and documented. Deviations from this program shall be reported in accordance with Section 5.6.2.1.a. 67

Specification (Cont'd)

afeguard operations include automatic plant trips and manual plant trips initiated by licensed personnel in emergencies or other situations requiring such actions.

Deviation from this specification shall be promptly reported in accordance with Section 5.6.2.1.a. | 67

Bases

The limiting condition is established to minimize shock to aquatic species of this region. An increase of 15F° per hour of the discharge canal should not cause detrimental effects to fish species since they are motile and capable of leaving the area. A decrease of 7F° per hour should aid in avoiding potential detrimental effects to fish as the discharge velocity will provide rapid mixing with the surrounding river water. The discharge velocity (10 fps) is large enough to discourage most fish from spending time in the region of maximum temperature.

Bases

Monitoring of the temperature change across the condensers will ensure representative temperature measurements before dilution of the circulating water with ambient river water. A linear correlation of the rate of temperature change in the discharge canal and the mixing zone boundary is assumed. Any lethal and sublethal effects on fish from sudden temperature changes shall be observed and promptly reported in accordance with Section 5.6.2.1.a. | 67

2.0 LIMITING CONDITIONS FOR OPERATION

Specification (Cont'd)

Unit No. 2 or Unit No. 1 shall not exceed 2.25 fps. When the daily (24-hour) average site river water temperature is less than 40°F the area average approach and the intake velocity shall be reduced to approximately 60% of the maximum full flow conditions of 870,000 gpm through the Unit No. 2 intake system and 318,000 gpm through the Unit No. 1 intake system. The adjustment in the two types of velocities will be made within one week after the 24-hour average site river water temperature reaches below 40°F. The flow rate will be restricted to 534,000 gpm through Unit No. 2 without the deicing loop operating and 374,000 gpm with the deicing loop operating during the winter time. All changes in flow rate shall be logged and reported in the Annual Environmental Operating Report. 67

Bases

The withdrawal of cooling water from the Hudson River through the outer protective screens may cause damage to aquatic biota by impingement on these screens. Fish collections have been experienced at the Indian Point Unit No. 1 intake screens and at Unit No. 2 during testing of the circulating water pumps. Information indicates that by maintaining the approach velocity at one (1) foot per second (fps) and the intake velocity to 2.25 fps or less, this problem should be significantly reduced.

3.0 MONITORING REQUIREMENTS

Specification (Cont'd)

flow rate are made, the site river water temperature(s) in front of the intake structure shall also be measured and recorded. Adjustments in the flow rate shall be described and reported in the Annual Environmental Operating Report including the above mentioned information. 67

Bases

At present the approach and intake velocities through the outer fixed screens are being calculated and recorded depending on the flow rate through each intake system. The licensee shall devise a procedure to measure the velocity or current, or pressure head through the forebay of the intake system so as to verify the actual velocity (linear or volumetric) through the traveling screens. When the outer fixed screens are pulled up

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Bases (Cont'd)

By design, the velocity approaching the outer screens of the intake structure is less than 1 fps. When the daily average site river 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 pump. A week is required to convert the outlet of the condensers so as to result in 60% recirculation of the cooling water. These loops permit approximately 40% of the pump flow to be returned back to the intake bay. Thus, the approach velocity of the river water transversing the outer fixed screens will be reduced to approximately 0.5 fps.

The intake velocity through the outer screens will not only be dependent on the pumping flow capacity of the circulating pumps and the area of the opening through which the circulating water flows but also the openings within the screened mesh. The R_f value, the resistance factor, corrects for the actual area of the openings in the screen through which the water passes. The intake velocity is calculated by taking into account the pumping flow, the area of opening and the resistance factor. The finer mesh of the outer screens serves to keep the smaller fish from penetrating to the trash racks and traveling screens but also causes a higher resistance to water flow, thereby causing an increase in the intake velocity. The licensee will observe through its impingement

Bases (Cont'd)

one or more times a day for washing off impinged fish or debris, the traveling screens collect what is transported past the trash racks to the screens by the water flow of the circulating water pumps. Occurrences of the screen washings and the number of fish collected are recorded and the fish count, type and size, are reported on a monthly basis to the Office of Nuclear Reactor Regulation (ONRR). 67

By monitoring and reporting the velocities through the intake system, a correlation with any fish impingement can be attempted. A better understanding of the problems of fish impingement will be obtained by calculating and measuring the dynamic characteristics of the intake system. However, any approach or intake velocities that caused or contributed to a significant impingement problem would be environmentally unacceptable.

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Bases (Cont'd)

surveillance program described in Section 4.1.2a(VI), the effects of velocity on the extent of impingement. The licensee shall provide proposed modifications to the velocity through the intake system to the Director of ONRR in the event of excessive fish impingements as measured by the impingement surveillance program. Results of all the flow restrictions and site river water temperature measurements will be reported in the Annual Environmental Operating Report. | 67 | 67

2.2.2 Air Bubbler System

Objective

To define the conditions for the specific mode of operation of the air bubbler systems and to provide the most effective mode for fish protection from impingement or other damage.

Specification

Except when out of service for maintenance, the air bubbler system will be operated in front of the outer intake screens in accordance with New York State requirements. The specific mode of operation (i.e., continuous, bursts, sporadic, random, specific pressures, etc.) will be determined through testing to provide the most effective fish protection mode.

The procedures and results of all tests will be reported upon in the Annual Environmental Operating Report. From the tests, the optimum mode of operation shall be established. | 67

3.2.2 Air Bubbler System

Objective

To monitor the operating tests of the air bubbler system at each intake.

Specification

Monitoring and recording of the results of tests to determine the optimum operating characteristics of the air bubbler system shall be carried out. All data on the tests shall be recorded and reported in the Annual Environmental Operating Report. | 67

Change No: 67
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Bases

The installation of double air bubbler screens for the intake of Units Nos. 1 and 2 was ordered by the New York State Department of Environmental Conservation on April 28, 1972. The air bubbler system will be tested in various modes of operation and in conjunction with other devices designed to keep fish away from the intake area. The final operational scheme of this system will depend on the results of these tests. Any unscheduled maintenance work on the air bubbler shall be reported in the Annual Environmental Operating Report as well as the results of the tests of this system. | 67

Bases

To understand how the air bubbler system will help to reduce impingement of organisms, a series of tests to determine the optimum operating characteristics shall be carried out in accordance with the Order of April 28, 1972 by the New York State Department of Environmental Conservation. The operating experience of the air bubbler system shall be documented and evaluated to determine the effectiveness of such a device for the purpose of fish protection.

.3 Discharge Velocity

3.2.3 Discharge Velocity

Objective

To limit the minimum discharge velocity of the cooling water through the discharge structure so that effective dilution with the receiving water of the Hudson River will be achieved.

Objective

To monitor and measure that a minimum discharge velocity of 10 fps shall be maintained at all power levels through each port in the discharge structure.

Specification

The discharge velocity as defined in Section 1.5.3, shall be measured from the head differential across the discharge structure and/or the flow rate and area of openings of the ports. Unless a lower head differential is permissible, in accordance with the following paragraph, the minimum head differential across the outfall structure shall be maintained at 1.5' to 1.7' to assure a minimum discharge velocity, as | 67

Specification

Measuring the water level differential of the water in the discharge canal as against that in the Hudson River will provide information useful in calculating the actual discharge velocity. The licensee shall provide a method of measurement of the discharge velocity, and conduct confirmatory current measurements that the discharge velocity is

Specification (Cont'd)

defined in section 1.5.3, of approximately 10 fps. The adjustable ports in the outfall structure shall be adjusted such that the discharge velocity, during operation, is maintained at 10 fps in accordance with the analysis of thermal discharge models (mathematical and hydraulic) except during testing of the structure and the circulating water system, and exploration of the effect of discharge velocity on the thermal plume temperature distribution. The adjustment in the ports shall be made within one to four hours after any change in the flow rate of the circulating water pumps.

At 50% power level and lower of Units Nos. 1 and 2, a discharge velocity through the discharge ports shall be maintained which will be required to satisfy the New York State Thermal Criteria.

Bases

The capability of a jet discharge to mix with the ambient receiving water is a strong function of the jet discharge velocity. The analysis of the thermal hydrological models has been performed based on the commitment that a minimum discharge velocity of 10 fps shall be maintained.

The modified multiport discharge structure uses adjustable gates that will provide a discharge velocity of at least 10 fps under varying

Specification (Cont'd)

being achieved through each of the particular ports. The opening of each gate and the flow rate of the pumps shall also be used to obtain the discharge velocity by dividing the flow rate over the area of the opening. All adjustments to the gates of each of the ports of the discharge structure shall be recorded and reported in the Annual Environmental Operating Report. Results of velocity measurements and optimum mode of operation of the discharge structure shall be reported in the Annual Environmental Operating Report. 67

Bases

In order to assure the proper mixing of the heated coolant water with the receiving water of the Hudson River, the proper discharge velocity has to be maintained. By actual measuring and recording the flows and water level differential, the licensee will be certain that proper dispersion of the thermal plume will occur in accordance with the mathematical and hydraulic models developed for Unit Nos. 1 and 2.

Change No: 67

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Bases (Cont'd)

flow rates. Such operation shall be conducted to give assurance that, at all power levels, the applicable New York State Thermal Criteria shall be met. The discharge velocity is obtained through the use of equation 1-3 in Section 1.5.3. For a discharge velocity at the vena contracta of about 10 fps, the difference in height across the discharge structure will be maintained at about 1.5 to 1.7 feet.

The relationship between power level, plant flow rate, discharge velocity, and characteristics of the thermal discharge (i.e., dilution of the discharge jet with the ambient river) shall be investigated to determine the optimum relationship and the final operating modes of the circulating water system through the intake-discharge structure. The results of all adjustments to the gates on the ports and measurements of the discharge velocity through the ports of the submerged structure shall be recorded and reported upon in the Annual Environmental Operating Report. 67

Change No: 67
Date: DEC 16 1975

Specification (Cont'd)

practicable measures to reduce it to 0.1 ppm or below that level shall be taken. The dates, times and length of chlorination, the amount, and concentration measured shall be logged. The need to chlorinate during tests outlined in Section 4.1.2a for studying the impact on biota shall be reported.

The desired criteria and goal toward which the licensee should strive is a total residual chlorine concentration of 0.1 ppm or less in the plant effluent to the Hudson River. However, plant design and the uncertainty of the interaction of chlorine residuals in the environment are such that flexibility must be incorporated into the criteria. Because of these uncertainties, the licensee will be permitted a period of one year in which the total residual chlorine level in the discharge shall not exceed 0.5 ppm in accord with the monitoring and analysis described in 3.3.1. A program of one year duration shall be undertaken to determine the feasibility of reducing the concentration of total residual chlorine at the confluence, consistent with plant operation. At the end of the program a report will be submitted to the Director of Reactor Licensing, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555. 67

The chlorine demand shall be determined at the rate of once per week within two hours prior to the chlorination of Indian Point Unit No. 2.

Specification (Cont'd)

(1) meter depth and three (3) meter depth at the discharge point of confluence with the Hudson River to assure that representative samples of chlorinated water being discharged into the Hudson River are being collected and analyzed.

Chlorine demand will be taken at the plant intake by collecting samples within two hours prior to the chlorination of Indian Point Unit No. 2. During and after chlorination treatment of the condenser, the chlorine discharges shall be visually inspected for evidence of any detrimental effects on aquatic life, such as dead fish or fish in distress. Such evidence shall be noted and a record of such evidence shall be maintained with the records of the amount, time and dates of chlorination. During the first year of operation, details of the chlorine monitoring program shall be reported in the Annual Enviro. 67
Operating Report including the results of any tests taken to reduce the level of total residual chlorine discharged into the Hudson River. These results will determine if the maximum concentration of total residual chlorine can be reduced to levels of 0.1 ppm or less at the confluence of the discharge canal into the river. All data shall be reported in the Annual Environmental Operating Report. 67

Change No: 67
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2.0 LIMITING CONDITIONS FOR OPERATION

Specification

The average incremental increase in the concentration of chromium (as CrO_4) or Drewgard 100 in the circulating cooling water resulting from equipment leakage shall not exceed 0.05 ppm, and 2.5 ppm respectively. Annual release of potassium chromate shall not exceed 11,000 lbs per year and that for Drewgard 100 shall not exceed 48,000 lbs per year.

Bases

Leakage of corrosion inhibitors from auxiliary systems may result in release of chromate ions or Drewgard 100 in the liquid discharges. Limiting the concentrations to small amounts will assure that aquatic biota will be protected since many species can reconcentrate chromate ion once absorbed into the body tissues.

3.0 MONITORING REQUIREMENTS

Specification

Samples of the circulating water shall be taken at 1 meter and 3 meter depth in the discharge canal and analyzed for the nexavalent chromium using an appropriate method of analysis. Determination of Drewgard 100 in the discharge canal shall be made by calculation of usage. Drewgard 100 shall be segregated and treated for zinc removal before discharge.

Bases

Sampling, analysis and determinations of the incremental amount of chromium and Drewgard 100 present in the discharge canal will indicate the amount and concentration of releases to the river to assure compliance with applicable regulations. Monitoring releases in the discharge canal will provide assurance of protecting the aquatic biota. Any accidental releases from equipment malfunction will also be noted and reported in the Annual Environmental Operating Report.

Change No. 67
Date DEC 16 1975

2.0 LIMITING CONDITIONS FOR OPERATION

Specification (Cont'd)

Table 2-2 lists the conditions under which the chemicals may be released, the maximum sustained release, and the concentration under the most adverse condition.

All the chemical discharges, whether released continuously or intermittently, shall not exceed the concentration levels shown in Table 2-1 in accordance with applicable regulations.

The water quality of the cooling water discharge shall be maintained such that the discharge of the condenser cooling water shall not cause the dissolved oxygen level at any point in the receiving water to fall below 5 ppm. When the site river water concentration of D.O. is below 5.5 ppm, the maximum decrease in concentration of D.O. at the confluence of the discharge canal and the river shall not be more than 0.5 ppm. When the D.O. is 5.5 ppm or above, the concentration of D.O. at the confluence of the discharge canal and the river shall not be less than 5.0 ppm.

Discharges, whether released batchwise or continuously, containing heavy metals shall be sufficiently diluted such as to result in an undetectable concentration. Discharges of heavy metals from both units shall be limited to concentration levels found not to be harmful to aquatic life.

3.0 MONITORING REQUIREMENTS

Specification (Cont'd)

available in the event that the analytical instrument used is not functioning.

Samples of the steam generator blowdown shall be analyzed for phosphate (PO_4) and total nitrogen from the hydrazine and cyclohexylamine on a monthly basis. Analysis for boron shall be conducted on a daily basis in the event of evaporator breakdown. Boron concentrations shall be limited to 1.0 ppm All pH measurements shall be taken during discharges of regenerant wastes and during releases on a batch basis such as in the event of evaporator breakdown. Such events shall be reported in the Annual Environmental Operating Reports. Any discharges during cleaning and during maintenance shall be reported in the Annual Environmental Operating Report. 67

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2.0 LIMITING CONDITIONS FOR OPERATION

Specification (Cont'd)

Discharges shall not contain concentrations of oil and grease that would produce a sheen in the receiving waters nor shall oil be discharged in any quantities that are harmful as defined pursuant to 40 CFR 110.

All industrial wastes, sludge deposits, sanitary sewage or discharges containing toxic contaminants or impurities, deleterious substances, or refuse shall be effectively treated and the amounts and concentration levels released shall be limited in accordance with the water quality classification established by the State for the Hudson River estuary. No taste or odor producing substances in amounts that will interfere with use for primary contact, recreational use, or will transmit any undesirable taste or odor to edible aquatic life shall be released. The discharges shall not contain any visible foam or floating solids.

B. Gaseous Effluents

The release of gaseous pollutants in combustion products from Unit No. 1 superheaters, the site's plant package boilers and any diesel powered units (such as auxiliary generators shall be limited through the use of low sulfur fuel oil in accordance with appropriate Federal, State and local regulations. Any other gaseous

3.0 MONITORING REQUIREMENTS

Specification (Cont'd)

Visual inspection shall be made and if oil is present in discharges, amounts released shall be estimated and any detectable effects on biota shall be reported in the Annual Environmental Operating Report. 67

Visual inspection and any other general inspection of the environs shall be made to assure that the environs are kept aesthetically desirable and provide for a healthy environment and a high water quality of the Hudson River.

B. Gaseous Effluents

Records shall be kept of the amount and composition (batch basis) of fossil fuels utilized at Indian Point.

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2.0 LIMITING CONDITIONS FOR OPERATION

Specification (Cont'd)

emissions containing waste gases and particulate matter from existing and future waste treatment facilities associated with the discharge shall be limited to less than permissible levels in Federal and State air quality standards.

C. Solid Effluents

Solid wastes collected from the intake screens and trash racks shall be dispersed in such a manner as to prevent its entry into navigable waters, except that which may return with the impinged fish.

Bases

Chemical releases from Units No. 1 and 2 are subject to the same dilution in the circulating water system discharge prior to release into the river as the radioactive effluents. The resulting concentrations during any prior operation of Unit No. 1 have not exceeded the limits established under these specifications.

3.0 MONITORING REQUIREMENTS

Specification (Cont'd)

C. Solid Effluents

Reports shall be kept on the sources of solid wastes, sludges, debris, approximate volumes disposed, the methods used for removal and transportation, and the location of the disposed materials. Data on the number, species, and size of fish collected at the screen on a daily basis will be reported in a monthly report to the Director of Reactor Licensing as well as to the New York State Department of Environmental Conservation.

Bases

The liquid effluent monitoring program is designed to demonstrate that the plant is being operated in accordance with Environmental Technical Specifications with respect to chemical discharges, water quality, changes in dissolved oxygen and other parameters. Samples taken and analyzed

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Date: [illegible]

Specification (Cont'd)

maintained between 6.5 and 8.5 pH units. No bulk amounts of acids or bases shall be instantaneously discharged without prior neutralization.

Bases

The limiting condition is established to minimize the effect of acids or bases on the natural aquatic ecosystems. By restricting the amounts of acids and bases released to the environment and controlling the pH levels and changes in pH levels the biota will be protected.

Specification (Cont'd)

The pH will be measured from samples taken at least one meter depth and 3 meter depth and the pH change of the circulating water shall be calculated before and after discharge.

Bases

Monitoring pH at the cooling water forebay of both units and in the cooling water discharge canal prior to release to the river will provide the change due to station operation. Sampling is based on assuring that no sudden changes or excesses of acidity or basicity will occur to result in damage to the aquatic life since large amounts of acids and bases are disposed of daily from the station. A neutralization facility is being built to neutralize all such wastes prior to discharge through the canal. All pH measurements shall be permanently logged and reported upon in the Annual Environmental Operating Report. 67

2.4 Radioactive Discharge

Effluent release limits are described in Section 3.9 of Appendix A, Technical Specifications.

3.4 Radioactive Discharge

Monitoring the radioactive discharges from Unit No. 2 and Unit No. 1 is described in Section 3.9, 4.1 and 4.11 of Appendix A, Technical Specifications, as well as Section 11.0 of the Final Facility Description and Safety Evaluation Report.

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TABLE 2-1 (Continued)

Parameter Analyzed for	Max. Conc. (ppm)	Collection and Analyses Frequency	Uses of Chemical
Turbidity		WK	
Dissolved Oxygen (Max. Decrease)*	≤0.5	WK	
Detergent	1.0	MO	Used for cleaning and laundry

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Notes for Table 2-1:

1. WK (weekly), MO (monthly), D (during discharge), DD (during discharge of regenerant wastes). Samples will be taken hourly during accidental or unplanned discharges.

2. Samples for the analyses of all parameters except chlorine demand and residual chlorine will be taken at the plant intake and at the confluence of the discharge canal with the Hudson River.

3. Chlorine demand will be taken at the plant intake. Samples for residual chlorine measurement will be taken at both the condenser outlet water box and at the confluence of the discharge canal with the Hudson River. The latter measurements are performed at approximately ten minute intervals while chlorination is taking place.

4. No heavy metal discharges are planned or anticipated other than those listed on the above table.

5. 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," (2) Water Works Association and the Water Pollution Control Federation in the book "Standard Methods for the Examination for Water and Waste Water," and (3) "Methods for Chemical Analyses for Water and Wastes," Publication No. 16020, Environmental Protection Agency, 1971. 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.

6. Sodium Hydroxide, Lithium Hydroxide, Sulfuric Acid, and Soda Ash shall be determined by monitoring pH.

*See Spec. 2.3.3 on page 2-28.

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Specification (Continued)

and location of sampling stations to be used and the temperature measurements taken will be presented and reported in accordance with the requirements of Section 5.6.1.2. 67

In reference to objective (iii), the following field survey and analysis program for the thermal discharges from the Indian Point facility, commencing with steady-state power operation of Unit No. 2, has been designed to achieve the objectives enumerated above.

The survey can be conveniently divided into the following areas:

A. Preliminary

An introductory analysis will be made, using both the mathematical and physical models (References 4.1-1, -2, -3, -4, -5, and -6), to determine the location for possible surface and subsurface transects. These predicted thermal plumes will be compared to the plume obtained via infrared overflights and/or surface measurements and subsurface measurements in order to determine and optimize the station locations for the transects. Possible interaction between the thermal plumes of Indian Point and other power plants operating on the Hudson River will be considered.

B. Near-Field Measurements

The near field is defined as the region within which effluent momentum is detectable as compared to natural dispersive processes and tidal momentum. For several discharge port configurations, thermal plume velocity (speed and direction) as well as temperatures will be obtained within several hundred feet of the outfall. The results will be time dependent three-dimensional temperature and velocity profiles (over a tidal cycle and over a number of required cycles).

C. Far-Field Measurements

The far-field program will include aerial temperature surveys along with tri-axial measurements through the detectable plume along with velocity measurements. The interaction between the near field and far

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.1.1b Meteorological Monitoring

Objective

The objective of meteorological monitoring is to satisfy the requirements of the Contingency Plan for Indian Point and to adequately measure and document meteorological conditions at the site to assess the impact of cooling towers.

Specification

A. The meteorological monitoring system shall be continued at Indian Point and shall satisfy the requirements of the Contingency Plan for Indian Point (FSAR for Indian Point No. 2, Vol. 6, Response to Question 12.5). Wind speed, wind direction and temperature difference instrumentation shall be maintained up to 100 feet AGL with at least one temperature sensor and wind sensor at the top of the tower. Important parameters (wind speed, wind direction, and ΔT) shall be available in the control room. Another set of sensors shall be located approximately ten meters AGL. Both sets of instruments shall meet recommendation for accuracy in Regulatory Guide 1.23.

B. A meteorological program shall be developed to assess the impact of hyperbolic cooling towers on the Indian Point environs. Instrumentation shall be included to sense dew point or humidity. The program shall be of approximately one year duration.

Reporting Requirements

If the outage time of any of the meteorological instruments exceeds seven consecutive days, the total outage time and dates of outage, the cause of the outage and the instrument(s) involved shall be reported within 30 days of the initial time of the outage to the Director of Reactor Licensing, U. S. Nuclear Regulatory Commission, Washington, D.C. 20555. 67

Bases

The collection of meteorological data at the plant site will provide information which may be used to develop atmospheric diffusion parameters to estimate potential radiation doses to the public resulting from actual routine or accidental releases of radioactive materials to the atmosphere. A meteorological data collection program as described above is necessary to meet the requirements of subparagraph 50.36a(a)(2) of 10 CFR Part 50 and Appendices D and E to 10 CFR Part 50.

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Bas :

The general ecological survey of the aquatic environment in the vicinity of the Indian Point facility will provide the necessary information to compare preoperational study with data taken during operation of Unit No. 2. In addition, the study program beginning with operation of Unit No. 2 contains suitable control sampling locations to afford a second reference for comparison effects. The program as it is now designed should differentiate between normal variability and station induced changes. Biological changes in the aquatic ecosystem that may result from station operation (e.g., changes in organism distribution, abundance and species composition) should be detected by the monitoring program, and an evaluation of these changes with other concurrent studies will allow a determination of the impact of the thermal and chemical discharges.

4.1.2a (2) Special Studies (See Figure 4-1, items 4, 24, 29, 31 and 37)

In conjunction with the General Hudson River Ecological Survey, the licensee is conducting a number of field and laboratory studies which support the survey program and will aid in determining the ecological impact of the Indian Point facility.

Objective

(1) Determine the major elements of the population dynamics of the striped bass (Morone saxatilis) and the white perch (Morone americanus) and an evaluation of the impact of plant operation on these major elements.

(2) Determine the acute and chronic effects of temperature and life stages of key aquatic species, the effect of temperature on the behavior and physiology of these organisms, the upper and lower temperature tolerance of these organisms and the relationship of these data to plant operations.

Specification:

The following studies will be performed as described in References 4.1-9 and 4.1-20 and the additional references attached to the bases. 67.

A. Population dynamics of the striped bass and white perch which would include: (See Figure 4-1, items 4, 15, 24, 29 and 31).

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Specification (Continued)

(6) develop and use mathematical models to aid in the evaluation of the effects of entrainment and impingement on the population of striped bass.

B. Specific aims of the ecological survey are as follows:

(1) Identify and quantitate the nature and the extent of changes in the distribution and abundance of phytoplankton, zooplankton, benthos and fish in the vicinity of the Indian Point Station from plant operation.

(2) Identify the species which can be used as key indicators and establish the biological sampling and analytical methods for laboratory and field studies to indicate as early as possible and as accurately as possible the magnitude of impact on once-through cooling on the aquatic ecosystem. The sampling locations for phytoplankton, zooplankton, and fish are illustrated in Fig. 4-2. Sampling locations for micro and macro plankton are shown in Stations 1 to 7 in Fig. 4-2. The sampling locations for benthos are illustrated in Fig. 4-3.

(3) Provisions will be made for the degree of flexibility necessary for effective operation and effective performance of this program. Administrative controls presented in Section 5.0 outline the reporting requirements for this program and the provisions of changes in the program. Changes to the program and review of such changes by the Regulatory Staff shall be as follows:

(a) Biological studies shown in Fig. 4-1 involving the sampling of the Hudson River for phytoplankton, zooplankton, benthos, fish and organism entrainment and impingement to determine plant impact shall not be terminated without prior review and approval by the Director of ONRR. Special field and laboratory studies as set forth in 4.1.2 shall similarly require prior review and approval before termination. 67

(b) Changes involving Hudson River sampling locations, frequency and methodology, laboratory techniques and data analysis shall be permitted without review and approval of the Director of ONRR. Similar changes relating to special studies and/or laboratory investigations shall also be permitted. However, all such program modifications shall be documented in the next submittal of the semi-Annual report (See Sect. 5.6.1.2) and described in detail with respect to the reasons requiring the changes and their effect on past and future impact evaluations. 67

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Specification (Continued)

(1) determination of relative and absolute population densities,
(2) natural survival and mortality rate,
(3) age composition of the two populations and their growth rates,
(4) determination of importance of age and body size for sexual maturation,
(5) population sex ratios,
(6) food habits,
(7) reproductive rates,
(8) migratory habits, and

B. The study will also provide the following information: (See Figure 4-1, item 15)

(1) Catch per unit effort.
(2) Size frequency distribution.
(3) Species diversity.

C. Determination of the behavioral and physiological response of selected benthic, nektonic and planktonic organisms to plant discharges which will include: (See Figure 4-1, item 37)

(1) Determination of the degree of attraction of fish to the discharge canal with tagging experiments in the canal and plume to determine residence periods and local dispersal.

(2) Evaluation of the acute and chronic effects of temperature including gas bubble disease on behavior and survival of fish, fish eggs and larvae, benthic invertebrates and major zooplankton species. 67

(3) Determination of the thermal preferences and avoidances and the impact of thermal shock on selected fish.

(4) Determination of active respiration rates in the laboratory for selected fish and benthos in order to evaluate the effects of thermal discharges on secondary production rates.

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(8) from (6) and (7) by the use of standard actuarial calculations for survival under exposure to competing risks of death, the survival rate for each early life history stage in the absence of the operation of the power plant (note that Unit No. 1 and Unit No. 2 effects can be treated separately here and both can be differentiated from background natural mortality);

(9) from (7) and (8) the decrease in survival during the early life history due to operation of Indian Point Units Nos. 1 and 2.

The calculations of the fraction of the year class affected by entrainment are not sensitive to the natural fluctuations in year-class strength which complicate interpretation of population density changes. Entrainment affects a certain proportion of the fish population and is primarily a function of the fraction of the estuarine water withdrawn by the power plant cooling system. Appropriate allowance for non-random distribution of the fish and avoidance capability of the juveniles must be made, but again these phenomena are not believed to change because of year-class size.

The magnitude of natural mortality varies from year to year in the early life history stages, but is always quite high. The variations do influence the combined natural and power plant induced mortality, but the relationship can be predicted as in step (8) above for any observed or postulated natural mortality rate if the components of natural mortality are sufficiently quantified.

The spatial distribution of spawning and surviving young fish may vary, especially as a function of volume of freshwater discharge in the Hudson, and correlated physical and biological conditions. Such phenomena are casually related to variations in year-class size.

The spatial distribution of early stages of striped bass and white perch would influence the fraction of each year-class exposed to entrainment. By utilizing the population data discussed above in the models of the Hudson estuary striped bass population developed by Dr. John Lawler of QLM, (Reference 4.1-10), and Dr. Philip Goodyear of Oak Ridge National Laboratory, (Reference 4.1-21, -22), the effects of any observed or postulated change in spatial distribution of spawning fish and early life states of the progeny on the entrainment phenomenon can be readily predicted. 67

The simulation model is simply a device for assessing the outcome of joint operation of the many population phenomena described individually through the field studies. This comprehensive response of an integrated biological system to impact is complementary to assessments of the individual population phenomena empirically studied in the field.

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Computer simulation, hydraulic modeling, aerial infrared measurements at all tidal stages (correlated with control measurements in the river), and a 25 station thermal grid are being used to derive the intensity and extent of thermal discharges (Units Nos. 1 & 2 and a prediction of values for all three units). Thermal infrared imagery will be collected during four overflights to coincide as close as possible to the major phases of the tidal cycle (e.g., high and low slack, maximum ebb and flood). These overflights will be replicated with Unit No. 1 operating alone, Units Nos. 1 and 2 together, and Units Nos. 1, 2 and 3 as a battery. The thermal imagery will be used to compile isothermal maps with 1°F contour intervals from Stony Point to Annsville Creek and inclusive. The 25 station thermal grid is placed in the river once a month to permit the construction of axial and cross-section isothermal plots of the thermal plume. The grid system will be located in the vicinity of the Indian Point station. The exact location will depend on biological needs and findings.

Plant production records provide data on the frequency of chlorination, concentrations and durations by season as related to organic build-up in various water passages, and efficiency losses in order to establish the minimum amounts of chlorination that are absolutely necessary. Physical and chemical parameters are being measured in the intake bays and effluent canal and also at three transects (Figure 4-2): one from Verplanck southwest to Stony Point, one from Jones Point to Peekskill, and the third, a Y-shaped transect, at Indian Point. Each transect includes a main channel (deep) and a bay area (shallow) which allows for evaluations in different habitats. The northern transect serves as the control and the southern will show the effects of passing through the plant's influence. The middle transect is designed to sample close to the nuclear facility itself. The physical-chemical measurements (along with previous data) will define those physical and chemical properties of the estuary which have important influences on the biota. (Table 4.1-2)

67

The end result of this measurement program will be an atlas, which presents a multidimensional picture of the pertinent variables in the Indian Point area of the lower Hudson River. This reference will serve as a data base, in a readily usable format, which will allow investigators to quickly recognize the onset of unusual conditions of water quality. Current velocity (as a function of season and wind conditions) is being measured with depth for six tidal cycles spanning one lunar month. Dissolved ion

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V. ENTRAINMENT [See Figure 5, Item 19]

Objective

The purpose of the entrainment study is (1) to provide information on the types and quantities of plankton, fish eggs and larvae passed through the condenser cooling water system to determine the effect of passage on their survival, and (2) to determine if losses observed from condenser passage will create adverse effects on the existing populations in the receiving water.

Specification

Studies of the magnitude of mortality during passage through the cooling water systems shall be continued through the first year of operation in order to verify that projected thermal, mechanical and chemical effects on phyto-, zoo- and ichthyoplankton based on laboratory and Unit No. 1 studies are valid for Unit No. 2. Phyto-, zoo-,and ichthyoplankton will be collected by either plankton nets or pumps at one intake bay each at Unit No. 1 and Unit No. 2 and at station D-2 (Fig. 4-3). Phyto and microzooplankton samples will also be taken at the condenser water boxes corresponding to the intake bays samples, when needed for special studies to distinguish between effects of temperature and chlorination. The types, quantities and survival of the entrained key species of phyto-, zoo-,and ichthyoplankton organisms shall be determined. 67 67

Sampling in the river required to determine if losses observed from condenser passage adversely affect existing populations in the Hudson River are provided by Specification 4.1.2.C (1), (2), and (4). The river sampling program contained in Specification 4.1.2.C (1), (2), and (4) will be coordinated with the plant cooling water system sampling program provided in this specification, so that information from the two sampling programs can be correlated. Methods and sample frequencies will by designed to obtain statistically valid conclusions on mortality rates and effects on populations in the river. Specific organism groups to investigate include:

(a) Phytoplankton

At least once every month the viability of phytoplankton subjected to condenser entrainment will be determined for duplicate samples collected from the intake water at Units Nos. 1 and

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Specification (Continued)

2, and duplicate samples taken at Station D-2 inside of the discharge canal. Samples will also be taken from appopriate condenser outlet water boxes of Units Nos. 1 and 2 when needed for special studies, such as to distinguish between thermal and chlorination effects. Photosynthetic rate will be used to determine viability at one hour and twenty four hours after collection. Chlorophyll a and species composition and density will also be determined.

(b) Zooplankton, Fish Eggs and Larvae

Microzooplankton will be sampled to determine survival on the same schedule as phytoplankton. Percent survival will be determined by count as soon as possible after collection and 24 hours after collection.

Once per week during the striped bass spawning and larvae season (approximately May 1 - July 15) duplicate samples will be taken from just beneath the surface, at mid-depth and at the bottom at one intake at Unit No. 1, one intake at Unit No. 2; and quadruplicate samples will be taken at discharge canal station D-2. 67

Samples will be collected every two weeks during the period beginning approximately July 15 through September 30, and once per month if weather permits, during the period November through April.

Analyses for dominant organisms will consist of species composition, abundance, counts of live, stunned and dead ichthyoplankton and macrozooplankton in all samples as soon as possible after collection. Additional analyses will be done 24 hours later in representative samples.

Bases

The biological significance of phyto-, zoo-, and ichthyoplankton being drawn or attracted into the intake canal is being quantitatively determined by measuring spatial and temporal distribution of planktonic organisms, applying these densities to the actual water mass subject to entrainment, comparing these theoretical entrainment values to observed densities of entrained organisms, and finally establishing the immediate and delayed effects of entrainment (passage) of non-screenable organisms through the condenser system of the plant. 67 67

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Reporting Requirments

(a) If compliance with Specification 1 requires a power reduction at the facility which results in an emergency need for power* in the licensee's system, the limits may be exceeded. Under these circumstances, the licensee shall inform the Director of Region I, Office of Inspection and Enforcement, within 24 hours of the anticipated length of time and magnitude of the variation from the limits. Within 10 working days after the termination of the emergency power need, the licensee shall submit a report to the Director of Reactor Licensing documenting the emergency need for power and the extent of the environmental impact. 67

(b) The licensee shall submit to the Director of Region I, Office of Inspection and Enforcement, by the 10th day of the following month a monthly report tabulating the daily records of fish collection at Indian Point Facility, The report should include the daily number, species breakdown and total weights, and describe any corrective action taken to maintain fish loss within the limits of the specification. 67

(c) Records of routine fish kills and reportable kills shall be kept and summarized in monthly reports which shall be forwarded to the Director of Reactor Licensing, containing the daily data on the number, size, weight and species of fish collected at the intake screens (except for collections made during testing of the structure). Any corrective action taken to reduce a significant reportable fish kill shall also be reported. The monthly report shall be submitted to the NRC by the 10th working day of the following month. 67 67

(d) After one year from the date of issuance of an operating license for steady-state power, the staff and licensee shall review:

(1) The ecological significance of the effects of fish impingement on population density, size, abundance, and diversity of the fishery of the river along with the effects of entrainment and thermal and chemical discharges as a function of plant operating variables. The evaluation progra shall include the parameters investigated in Section 4.12a(1). These include studies of population dynamics, behavior characteristics, fish movements and other ecological parameters. Environmental factors such as temperature, river flow, salinity and plant operational variables which influence the extent of fish impingement shall be evaluated.

* An emergency need for power is a condition which will result in voltage reduction in excess of 5% or load shedding (except contracted interruptible loads) in the licensee's system unless additional power is obtained.

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(2) The effectiveness of the air bubblers, or reduced flow or other operating procedures to reduce these impingement losses.

(3) The adequacy of the specification and need for the implementation of any proposed design changes (e.g., common intake system).

Bases

Collection of impinged fish at the Indian Point Station will assure that the majority of fish killed in the intake structure will be identif'ed and enunerated. The identification, counting and lenth-weight data obtained for all impinged fish of importance will assure documentation for expected fish losses resulting from normal plant operation. The number of 5000 fish killed per day was established based on the past experience of fish kills at the Unit No. 1 intake and during testing of the circulating pumps at Unit No. 2 intake. The licensee has estimated the monthly mean of daily impingement is as follows:

January	3,024
February	15,372
March	1,892
April	1,988
May	724
June	564
July	2,064
August	3,256
September	4,868
October	468
November	3,720
December	4,256

In its Findings of Fact and Conclusions of Law, the licensee found that the best estimates of annual impingement from operating Units Nos. 1 and 2 based on the most recent available data, which corresponds as closely as possible to the proposed modes of operation of the plants, would be approximately 1,252,500 fish with a total weight to 16,000 pounds (Reference 4-17). For any testing up to full power operation, 67

Pending development of information from the ecological survey presented in Section 4.1.2a (1), this specification of a reporting level provides a mechanism for the NRC's Regulatory staff to be kept currently advised of the number of fish being collected at the intake screens to determine what further methods can be developed to reduce these numbers. 67

The reportable levels provided in this specification will aid in the development of interim operational procedures and corrective actions to be taken to minimize the Station's impact on the fishery resources.

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Table 4.1-1 Population Data for Assessment of Impact of Indian Point Unit #2 Upon Population Density of Striped Bass and White Perch in Hudson Estuary

Year	Power Plant Impact: Unit #1	Power Plant Impact: Unit #2	Data on Fish Populations: Eggs	Larvae	Juvenile I	Age Group 0: Juvenile II	Age Group 0: Juvenile III	Age Group I	Age Group II	Age Group III	Age Group I
1969	Entrainment Impingement	None	–	–	–	△1 ①1	△1 ①1	△1 ①1	△1	①1	
1970	Entrainment Impingement	None	–	–	–	△1 ①1	△1 ①1	△1 ①1	△1	①1	
1971	Entrainment Impingement	None	–	–	–	–	–	–		–	
1972	Entrainment Impingement	None	–	–	–	△1 ①1	△1 ①1	△1 ①1	△1	①1	
1973	Entrainment Impingement	Impingement	◇1	◇1	–	△1 ①1 1	△1 ①1	△1 ①1 1	△1	①1	
1974	Entrainment Impingement	Entrainment Impingement	◇2	◇2	–	△2 ②2 2	△2 ②2	△2 ②2 2	△2	②2	
1975	Entrainment Impingement	Entrainment Impingement	◇2	◇2	–	△2 ②2 2	△2 ②2	△2 ②2 2	△2	②2	

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Date: DEC 16 1975

Reporting Requirements

The measuring and reporting of radioactivity in the environs will follow that recommended in the NRC's Regulatory Guide 4:1, and in Section 5.6 of these Technical Specifications. 67

Basis

The environmental monitoring program conducted by the Consolidated Edison Company will supply sufficient data to insure that changes in the environmental radioactivity will be detected and that data needed to assess the impact of plant releases on the environment will be obtained. The New York State Department of Environmental Conservation conducts periodic surveys on samples of air, water, milk and wildlife and the New York University Medical Center also provides supporting work in the area of radioecology.

Consolidated Edison's radiological environmental monitoring program will include measurements of radioactivity in fresh water, river water, river sediments, fish, aquatic vegetation, vegetation, soil, air, and milk in the vicinity of the Indian Point Station. This program began with a survey instituted in 1958 (four years prior to operation of Unit No. 1) to determine the radioactivity in the environment in the vicinity of the Indian Point Station. The purpose of this survey was to determine the natural background radioactivity and to show the variations in the activities that may be expected from natural sources, fallout from bomb tests, and other sources in the vicinity. The program has been continued to the present so that changes in the environment resulting from operation of Unit No. 1 can be accounted for.

As a part of this program, rain is collected at the Indian Point Station and at a point fifteen miles south of the station. This is a continuous collection which is sampled monthly and analyzed. Air samples are collected at seven points on site by means of fixed-membrane filters followed by charcoal filters. Air collections are also made offsite at selected points with similar equipment. The number and location of air sampling stations onsite and those offsite, based on meteorological and population data, and the type of any postulated release from the plant should be evaluated during the first year of operation of Unit No. 2. Realistic population dose calculations from these measurements, and those taken from the milk and food crop samples as described below shall be carried out using the meterological information gathered in Section 4.1.1b.

Change No: 67
Date: DEC 16 1975

Reporting Requirements

The measuring and reporting of radioactivity in the environs will follow that recommended in the NRC's Regulatory Guide 4:1, and in Section 5.6 of these Technical Specifications. 67

Basis

The environmental monitoring program conducted by the Consolidated Edison Company will supply sufficient data to insure that changes in the environmental radioactivity will be detected and that data needed to assess the impact of plant releases on the environment will be obtained. The New York State Department of Environmental Conservation conducts periodic surveys on samples of air, water, milk and wildlife and the New York University Medical Center also provides supporting work in the area of radioecology.

Consolidated Edison's radiological environmental monitoring program will include measurements of radioactivity in fresh water, river water, river sediments, fish, aquatic vegetation, vegetation, soil, air, and milk in the vicinity of the Indian Point Station. This program began with a survey instituted in 1958 (four years prior to operation of Unit No. 1) to determine the radioactivity in the environment in the vicinity of the Indian Point Station. The purpose of this survey was to determine the natural background radioactivity and to show the variations in the activities that may be expected from natural sources, fallout from bomb tests, and other sources in the vicinity. The program has been continued to the present so that changes in the environment resulting from operation of Unit No. 1 can be accounted for.

As a part of this program, rain is collected at the Indian Point Station and at a point fifteen miles south of the station. This is a continuous collection which is sampled monthly and analyzed. Air samples are collected at seven points on site by means of fixed-membrane filters followed by charcoal filters. Air collections are also made offsite at selected points with similar equipment. The number and location of air sampling stations onsite and those offsite, based on meteorological and population data, and the type of any postulated release from the plant should be evaluated during the first year of operation of Unit No. 2. Realistic population dose calculations from these measurements, and those taken from the milk and food crop samples as described below shall be carried out using the meterological information gathered in Section 4.1.1b.

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Basis (Continued)

The current environmental monitoring program at the Indian Point Station is set forth in more detail in Table 4.2-2. The frequency of sampling and analysis is indicated in Table 4.2.-1 for a two regime program dependent on the release rate from the station as measured by in-plant or process radiation monitors. Gamma spectral and radionuclide content measurement of the above samples are made during the Program 2 schedule. Sampling locations for 21 stations within five miles of the site are indicated in Figure 4-5. Additional stations include the dairy farms and milk dairies and the rain water sampling station 15 miles south of the station. 67

Although the design of the proposed facility and administrative controls will be such that gaseous and liquid effluents will be released in accordance with the requirements of 10 CFR 20 and 10 CFR 50, the environmental monitoring program of the Consolidated Edison Company will detect changes far below levels permitted by 10 CFR 20 and provides a redundant means of insuring that the operation of the proposed facility does not pose any undue risk to the health and safety of the public. The New York State and New York University programs provide an independent means of verifying the proposed facilities will be in compliance with 10 CFR 20 and 10 CFR 50.

NOTE: The existing radiological environmental monitoring program currently presented in Section 4.10 of Appendix A, as issued on April 20, 1973 shall remain in force until January 1, 1974 at which time the requirements of section 4.2.1.a and 4.2.1.b shall take effect.

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.1b Radiological Monitoring of Iodine-131 via Air-Pasture-Cow-Milk Pathway

Objective

To measure the amount of I-131 contained in milk of cows in the vicinity of the Indian Point Station in accordance with NRC regulations of 10 CFR 20 and 10 CFR 50, in order to assure that the dose rate from radioiodine is 15 mrem per year or less to the thyroid of a child.

Specification

During the seasons when the cows are in pasture, samples of fresh milk of cows located in the vicinity (within seven miles) of the Indian Point Station shall be taken and analyzed in accordance with the NRC Regulatory Guides 1.42 and 4.1. Samples of fresh milk shall be taken on a monthly basis from farms such as the Hanover Hill Farm, and one located seven miles in the south south-west direction of the plant site* (in critical wind sector). Samples shall also be taken on a monthly schedule from milk processing dairies, such as Crowley Milk Company and the Dairymen's League, and which may use milk produced from cows pastured within the vicinity of the station, and the samples are analyzed for their radioiodine content calculated as Iodine-131. Samples of milk of sufficient quantity shall be taken and analyzed with state-of-the-art counting equipment for gamma radiation to obtain within an overall error of ± 25% in the analysis. 67

Analysis shall be carried out within eight days (one I-131 half-life) of sampling. Suitable analytical procedures should be used to determine the radioiodine content to the best sensitivity available using the state-of-the-art counting equipment. Counting statistics will be such that the overall error of the analysis will be within ± 25%. Results will be reported, with associated calculated error, as picocuries of I-131 per liter of milk at the time of sampling, in accordance with Reporting Requirements for Environmental Radiological Monitoring. Samples of fresh milk from the farm in the SSW direction shall be analyzed for Cs-134 and Cs-137 and Sr-89 and Sr-90 on a monthly basis in addition to I-131.

* On a monthly basis.

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Reporting Requirement

(1) If the measured concentration of I-131 in the milk exceeds 10 picocuries per liter, a report will be made to the Region I, Office of Inspection and Enforcement, within 24 hours by telephone or telegraph, and a plan will be submitted within 10 working days to determine the cause of the elevated levels, and methods to reduce the dose to 15 mrem/yr. A weekly analysis schedule will be initiated and continued until levels fall below 5 pCi/liter. 67

(2) If milk samples collected over a calendar quarter show total levels of I-131 radioactivity of 5 pCi/liter which could result in accumulated doses to a child of 7.5 mrem for that quarter, the results will be reported to the Director of Reactor Licensing, Washington, D.C. and a plan will be submitted within 30 days and implemented to limit the I-131 discharges so that the annual thyroid dose to a child shall not exceed 15 mrem/yr. 67

Bases

To assure that no one child will receive a dose of greater than 15 mrem/year to the thyroid, it is necessary to know the radioiodine concentration in fresh milk obtained during the time when the cows are grazing to the sensitivity given by the state-of-art counting techniques.

A concentration of I-131 in milk of 2.4 picocuries per liter will result in a dose to the thyroid of a 0-2 year old child of 15 mrem/year, based upon consumption of one liter per day for the year.

In accordance with the NRC's regulations, Paragraph 20.1(c) of 10 CFR 20 requires that radiation exposures and releases of radioactive materials in effluents to unrestricted areas be kept as low as practicable. In regards to radioiodine, the release rate of this radioisotope from the Indian Point Station should be kept to such levels that a dose rate to the thyroid of a child through the air-grass-cow-milk pathway will be 15 mrem per year or less at the points of maximum concentration at or beyond the site boundary where dairy cows are present or could be pastured. To assure this dose rate shall not be exceeded, the licensee shall carry out a radioiodine monitoring program since this specific pathway is the critical pathway for exposure from station releases. 67

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References

4.2-1 U. S. Atomic Energy Commission, "Interim Licensing Policy on As Low As Practicable for Gaseous Radioiodine Releases from Light-Water-Cooled Nuclear Power Reactors," Regulatory Guide 1.42, June 1973.

4.2-2 U. S. Atomic Energy Commission, "Measuring and Reporting of Radioactivity in the Environs of Nuclear Power Plants," Regulatory Guide 4.1, January 18, 1973.

4.2-3 New York State Department of Environmental Conservation, Environmental and Postoperational Survey for Radioactivity, Consolidated Edison Indian Point Reactors, September 1971.

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g. The Committee shall review all reported instances of violations of the ETS. Where investigation indicates to the Committee that such action is necessary, evaluation and formulation of recommendations to prevent recurrence of such violations shall be made, in accordance with ETS requirements and the procedures set forth as an appendix to the charter.

h. The Committee shall coordinate with the NFSC the development of the Environmental Technical Specifications Requirements and the development of procedures and programs pursuant to them to avoid conflicts and maintain consistency. Coordination procedures shall be in accordance with those of an appendix to the charter.

i. The Committee shall have the responsibility of performing the review and audit of proposed written procedures, as described in Section 5.4, and proposed changes thereto which affect the plant's environmental impact.

j. The Committee shall report the results of the environmental monitoring program in each Annual Environmental Operating Report. See Section 5.6.1.1. 67

8. Authority

a. The Committee shall report to, and advise, the Senior Vice President, Construction, Engineering and Environmental Affairs, and the Senior Vice President, Power Supply, on matters related to its areas of environmental concern.

b. Committee members shall be allowed full access to all relevant facility records.

5.2 Action to be taken in the Event of a Reportable Environmental Occurrence

A. Any reportable environmental occurrence shall be promptly reported to and investigated by the Station Manager. 7

B. The Station Manager shall promptly notify the Manager of the Nuclear Power Generation Department, Chairman of the EPC, and the Manager - Nuclear Services of any abnormal environmental occurrence.

C. The Manager - Nuclear Services, shall prepare and submit promptly a report in writing to the Manager of the Nuclear Power Generation Department following the observation of a reportable 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. A copy of the report shall be submitted to the Chairmen of the EPC and NFSC for review of any recommendations contained therein. 67

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D. The Manager of the Nuclear Power Generation Department will inform his supervisor of the reportable occurrenc such that in accordance with Figure 5-1, a Company officer shall report the circumstance of any reportable environmental occurrence to the NRC within 24 hours; as specified in Specification 5.6 "Plant Reporting Requirements," a written report shall follow within 10 working days. Each such occurrence shall be reported in the routine Annual Environmental Operating Report.

5.3 Actions to be Taken Prior to Special Tests or Changes

A. If the Station Manager decides to make a change in the facility or operating procedures, or to conduct a test or experiment, and concludes that the proposed change, test or experiment does not involve a change in the Environmental Technical Specifications or an unreviewed environmental question, he may order the change, test or experiment to be made, shall enter a description thereof in the operating records of the facility, and shall send a copy of the instructions pertinent thereto, to the Chairman of the EPC. If the Chairman of the EPC, upon reviewing such instructions, is of the opinion that the change, test or experiment is of such a nature as to warrant consideration by the Committee, he shall order such consideration.

B. If the Station Manager desires to make a change in the facility or operating procedures or to conduct a test or experiment which in his opinion might involve a change in the Environmental Technical Specifications, might involve an unreviewed environmental impact question or might otherwise not be in accordance with said license, he shall not order such change, test or experiment until he has referred the matter to the EPC for review and report. If the Committee is of the opinion that the proposed change, test or experiment does not require approval by the NRC under the terms of said license, it shall so report in writing to the Station Manager, together with a statement of the reasons for the Committee decision and the Station Manager may then proceed with the change, test or experiment. If, on the other hand, the Committee is of the opinion that approval of the NRC is required, the Committee shall prepare a request for such approval, including an appropriate environmental analysis in support of the request, and forward its report and request to the Senior Vice Presidents in charge of Construction, Engineering and Environmental Affairs, and Power Supply for their review with a copy to the Station Manager. One of said Vice Presidents shall thereupon forward the report and request to the NRC for approval unless, after review, the Vice Presidents either (a) disagree with the opinion of the Committee that approval of the NRC is required, or (b) decide that the proposed change, test or experiment is not necessary from the standpoint of Company policy or operations.

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5.4 Operating Procedures

A. Detailed written procedures including check-off lists and instructions, where applicable, shall be prepared, approved, and adhered to for the following:

1. Control of additions of chemicals for both the primary and secondary systems.
2. Control of release of chemicals in the circulating water discharge.
3. Control the flow of discharge waters to remain within the allowable rate of change, temperature differential and discharge temperatures.
4. Sampling methods, frequencies and locations.
5. Preventive or corrective procedures which could have an effect on the environmental aspects of the plant.
6. Calibration procedures for various instruments used in measuring and analyzing the samples which are required by these specifications.

B. All procedures, as they pertain to these specifications, shall be reviewed by the EPC and, if they affect plant operations, approved by the Station Manager. Such review and approvals shall occur prior to implementation of any procedures. Temporary changes to procedures which do not change the intent of the original procedure may be made, provided such changes are approved by the cognizant member of the EPC and such changes shall be documented and subsequently reviewed by the EPC.

C. All standard procedures should include provisions to ensure the plant and all its systems and components are operated in compliance with the limiting conditions for operation established as part of the environmental technical specifications.

5.5 Record Retention

A. Record Retention - 5 Years

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Records and/or logs relative to the following items shall be kept in a manner convenient for review and retained for five years. 67

1. Records of normal plant operation, including power levels and period of operation at each power level.

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2. Records of principal maintenance activities, including repair, substitution or replacement of special items of equipment pertaining to environmental impact.
3. Records of occurrences in violation of environmental technical specifications.
4. Records of periodic checks, inspections and calibrations performed to verify that environmental surveillance requirements are being met.
5. Records of any special operational modes (tests or experiments) affecting environmental impact.
6. Records of changes made to procedures, equipment, permits and certificates affecting environmental impact.
7. Records of changes to operating procedures affecting environmental impact.
8. Environmental Protection Committee meeting minutes.

B. Record Retention - Life of Plant

Records relative to the following items shall be kept in a manner convenient for review and retained for the life of the plant.

1. Records of offsite environmental monitoring surveys.

5.6 Plant Reporting Requirements

5.6.1 Routine Reports

5.6.1.1 Annual Environmental Operating Report

Part A: Nonradiological Report. A report on the environmental surveillance programs for the previous 12 months of operation shall be submitted to the Director of the Region I Office of Inspection and Enforcement (with copies to the Director, Office of Nuclear Reactor Regulation) as a separate document within 90 days after January 1 of each year. The period of the first report shall begin on January 1, 1975. The report shall include summaries, interpretations, and statistical evaluation of the results of the nonradiological environmental monitoring programs required by limiting conditions for operation (Section 3.0) and environmental surveillance activities (Section 4.0) for the report period. The report shall include a comparison with preoperational studies, operational controls (as appropriate), and previous environmental surveillance reports and an assessment of the observed impacts of the

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5.6 Plant Reporting Requirements (Continued)

plant operation on the environment. If harmful effects or evidence of irreversible damage are detected by the monitoring, the licensee shall provide an analysis of the problem and a proposed course of action to alleviate the problem. Specifically the following information shall be provided in this report.

a. Thermal Discharges and Hydraulics

- Data on daily maximum, minimum, and average temperature measurements of the water in the intake and discharge canal water, and the ΔTc across the CWS during full and reduced flows and during pump maintenance and deicing operations.
- Any rate of temperature change across the condenser pursuant to Sections 2.1.4 and 3.1.4.
- Condenser flow rates, and changes in flow rates including date and time of day when reduced flow takes place.
- Total thermal energy in Btu released through the discharge outfall during the month.
- Maximum and average release rate of energy through the discharge outfall in Btu per hour.
- Calculated intake velocity and flow rate per intake screen.
- Discharge velocity, head differential across the discharge canal (24 hrs. average), results of adjustments of gates of discharge structure.

b. Chlorination of Cooling Water

- The dates on which chlorination was performed.
- Amount of sodium hypochlorite consumed during each chlorination.

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5.6 Plant Reporting Requirements (Continued)

- Concentration of sodium hypochlorite used.
- Analytical results of chlorine tests.
- Cooling water flow rate during chlorination.

c. Chemical Discharges and Water Quality

- Dates and times at which samples were taken and analyzed in accordance with Table 2-1.
- Analytical results of tests performed in accordance with Table 2-1.
- Inventory of chemicals discharged in accordance with Table 2-2.
- Water flow rate in the discharge canal at times of releases.
- Amount of non-radioactive solid waste material collected (in cubic feet) at the intake screens and disposed of as solid waste in accordance with local regulations.
- Dissolved oxygen concentration measurements.
- pH measurements.

Part B: Radiological Report. A report on the radiological environmental surveillance programs for the previous 12 months of operation shall be submitted to the Director of the Region I Office of Inspection and Enforcement (with copies to the Director of the Office of Nuclear Reactor Regulation) as a separate document within 90 days after January 1 of each year. The period of the first report shall begin on January 1, 1975. The reports shall include summaries, interpretations, and statistical evaluation of the results of the radiological environmental surveillance activities for the report period, including a comparison with preoperational studies, operational controls (as appropriate), and previous environmental surveillance reports and an assessment of the observed impacts of the plant operation on the environment.

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5.6 Plant Reporting Requirements (Continued)

Results of all radiological environmental samples taken shall be summarized on an annual basis following the format of Table 5-1. In the event that some results are not available within the 90 day period, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

a. For each medium sampled during the yearly period, the following information shall be provided:

(1) Number of sampling locations.
(2) Total number of samples.
(3) Number of locations at which levels are found to be significantly above local backgrounds.
(4) Highest, lowest, and the annual average concentrations or levels of radiation for the sampling point with the highest average and description of the location of that point with respect to the site.
(5) Method of measurements.

b. If levels of plant contributed radioactive materials in environmental media indicate the likelihood of public intakes in excess of 3% of those that could result from continuous exposure to the concentration values listed in Appendix B, Table II, 10 CFR 20, estimates of the likely resultant exposure to individuals and to population groups, and assumptions upon which estimates are based shall be provided.

c. If statistically significant variations in offsite environmental concentrations with time are observed and are attributed to plant releases, correlation of these results with effluent releases shall be provided.

5.6.1.2 Semiannual, and/or Special Environmental Operating Reports

A. Non-radiological

A Progress Report and/or Annual Report shall be submitted by the licensee to the Director of Office of Nuclear Reactor Regulation, Washington, D.C. 20555, by the end of July and the end

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5.6 Plant Reporting Requirements (Continued)

of January, or as otherwise specified below, describing activities of the Thermal Plume Mapping and Ecological Survey Program, Entrainment Studies, Impingement Studies, and Special studies for for the prior six-month interval. Information to be presented will include the following:

a. Effects of chlorine and other chemical discharges on the ecosystem of the Hudson River in accordance with Sections 2.3 and 3.3 and 4.1.2a(2).

b. Reduction in frequency of chlorination and reduction in concentration of free and combined residual chlorine in the discharge canal.

c. Thermal plume model verification and mapping (near and far field) in accordance with Section 4.1.1.a.

d. Ecological effects of thermal discharges in accordance with Section 4.1.2.a(2).

e. Potential reduction in dissolved oxygen in the cooling water through the plant.

f. An assessment of performance of fish pumps as installed.

g. Results of the general ecological survey in accordance with Section 4.1.2a(1).

h. Ecological effects of entrainment of organisms in accordance with Section 4.1.2a(2)V.

i. Evaluation of head loss across the fixed intake screens as a function of velocity through the screens and fish collected.

j. Ecological effects of fish impingement in accordance with Section 4.1.2a(2)VI.

k. Operational experience of air bubblers at Units Nos. 1 and 2 to prevent fish impingement.

l. Other ecological effects as indicated in Section 4.0.

m. Evaluation of data in accordance with Section 4.1.2a(2) (I through IV).

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5.6 Plant Reporting Requirements (Continued)

Upon completion of the environmental surveillance studies as described in Section 4.0 a final summary report for each individual project shall be submitted within six (6) months of completion of each study to the Director of Office of Nuclear Reactor Regulation, Washington, D.C. 20555. A final overall summary report when all the projects are completed shall be furnished on the same schedule as above.

Monthly report on the number of each species of fish collected per day on the intake screens shall be submitted to the Region I Office of Inspection and Enforcement and copies to the Director of Office of Nuclear Reactor Regulation and the New York Department of Environmental Conservation, in accordance with items (b) and (c) under Reporting Requirements in Section 4.1.2a(2)VI.

All reports submitted to other Federal agencies or to the New York State Department of Environmental Conservation as a requirement of a permit or certificate involving environmental matters shall also be submitted to the NRC at the same time.

B. Radiological

A report on the radioactive discharges released from the site during the previous six (6) months of operation shall be submitted to the Director of the Region I Office of Inspection and Enforcement (with copies to the Director of Office of Nuclear Reactor Regulation) within 60 days after January 1 and July 1 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the plant as outlined in Regulatory Guide 1.21,* measuring, evaluating, and reporting radioactivity in solid wastes and releases of radioactive materials in liquid and gaseous effluents from light-water-cooled nuclear power plants with data summarized on a quarterly basis following the format of Appendix B thereof.

The report shall include a summary of the meteorological conditions concurrent with the release of gaseous effluents during each quarter as outlined in Regulatory Guide 1.21,* with data

*Issued June 1974.

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5.6 Plant Reporting Requirements (Continued)

summarized on a quarterly basis following the format of Appendix B thereof. Calculated offsite dose to humans resulting from the release of effluents and their subsequent dispersion in the atmosphere shall be reported as recommended in Regulatory Guide 1.21.*

5.6.2 Nonroutine Reports

5.6.2.1 Nonroutine Environmental Operating Reports

A report shall be submitted in the event that (a) a limiting condition for operation is exceeded (as specified in Section 2.0, "Limiting Conditions for Operation"), (b) a report level is reached (as specified in Section 4.0, "Environmental Surveillance"), or (c) an unusual or important event occurs that causes a significant environmental impact, that affects potential environmental impact from plant operation, or that has high public or potential public interest concerning environmental impact from plant operation. Reports shall be submitted under one of the report schedules described below.

a. Prompt Report. Those events requiring prompt reports within 24 hours by telephone, telegraph, or facsimile transmission to the Director of the Region I Office of Inspection and Enforcement and within 10 days by a written report to the Director of the Region I Office of Inspection and Enforcement (with copies to the Director of Office of Nuclear Reactor Regulation).

b. 30-Day Report. Those events not requiring a prompt report shall be reported within 30 days by a written report to the Director of the Region I Office of Inspection and Enforcement (with copies to the Director of Office of Nuclear Reactor Regulation).

The reporting schedule for reports concerning limiting conditions for operation and report levels shall be specified in the licensee's technical specifications. Reports concerning unusual or important events shall be reported on the prompt schedule.

Written 10-day and 30-day reports and, to the extent possible, the preliminary telephone, telegraph, or facsimile reports shall (a) describe, analyze, and evaluate the occurrence, including extent and magnitude of the impact, (b) describe the cause of the occurrence, and (c)

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indicate the corrective action (including any significant changes made in procedures) taken to preclude repetition of the occurrence and to prevent similar occurrences involving similar components or systems.

The significance of an unusual or apparently important event with regard to environmental impact may not be obvious or fully appreciated at the time of occurrence. In such cases, the NRC shall be informed promptly of changes in the licensee's assessment of the significance of the event and a corrected report shall be submitted as expeditiously as possible.

5.6.2.2 Nonroutine Radiological Environmental Operating Report

a. Anomalous Measurement Report. If, during any yearly report period, a confirmed measured level of radioactivity in any environmental medium exceeds ten times the control station value, a written report shall be submitted to the Director of the Region I Office of Inspection and Enforcement (with copies to the Director of Office of Nuclear Reactor Regulation) within 10 days after confirmation.* This report shall include an evaluation of any release conditions, environmental factors, or other aspects necessary to explain the anomalous result.

b. If levels of radioactive materials in environmental media from plant contributed radionuclides indicate that the resultant dose to an individual from these levels could equal or exceed 10 mrem/yr, estimates of the resultant doses to individuals and critical population groups, and the assumptions upon which the estimates are based shall be provided.

If levels of radioactivity in an environmental media sample indicate that the resultant dose to an individual from these levels could equal or exceed 40 mrem/yr, a report will be made to the Regulatory Operations Office, Region I, within 24 hours by telephone or telegraph, and a plan will be submitted within one week to determine the cause of the elevated levels and to reduce

*A confirmatory reanalysis of the original, a duplicate or a new sample may be desirable, as appropriate. The results of the confirmatory analysis shall be completed at the earliest time consistent with the analysis but in any case within 30 days. If the high volume is real, the report to the NRC shall be submitted.

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the doses to the design objective. For example, if individual charcoal filters show I-131 concentrations in air of 2.6×10^{-12} $\mu Ci/cm^3$ (2.6 pCi/m^3) or greater (1.1×10^{-14} $\mu Ci/cm^3$ if the milk pathway is involved), or if individual milk samples show I-131 concentrations of 10×10^{-9} $\mu Ci/cm^3$ (10 pCi/1) or greater, the results will be reported within 24 hours along with a plan to determine the cause of and to reduce these levels submitted as above.

c. If samples of environmental media collected over a calendar quarter show total levels of radioactivity from plant contributed radionuclides that would result in accumulated doses to an individual of 3.8 mrem in those two quarters, the results shall be reported and a plan submitted and implemented within 30 days to limit conditions so that the annual dose to an individual will not exceed the design objective.

d. If such levels as discussed in (a) and (b) can be definitely shown to result from sources other than the licensed plant (e.g., from testing of nuclear devices) by similar concentrations found in "background samples" - i.e., samples that could not be affected by emission from the licensed plant, this reporting action need not be taken. Justification for assigning high levels of radioactivity to sources other than the plant must be provided in the report.

e. If statistically significant variations of offsite environmental radionuclide concentrations with time are observed, a comparison of these results with effluent releases shall be provided.

f. Individual samples which show higher than normal levels (25% above background for external dose, or twice background for radionuclide content) should be noted in the reports.

g. Nonroutine Radioactive Effluent Report

The reporting requirements for nonroutine radioactive discharges are specified in Section 3.9 and 6.0 of Appendix A of the Technical Specifications.

5.6.3 Changes in Environmental Technical Specifications

5.6.3.1 A report shall be made to the NRC prior to implementation of a change in plant design, in plant operation, or in procedures described in Section 5.5 if the change would have a significant effect

5.6 Plant Reporting Requirements (Continued)

on the environment or involves an environmental matter or question not previously reviewed and evaluated by the NRC. The report shall include a description and evaluation of the changes and a supporting benefit-cost analysis of the changes. These changes do not preclude making changes on short notice that are signifi ant in terms of decreasing the adverse environmental impact.

5.6.3.2 Request for changes in environmental technical specifications shall be submitted to the Director for Reactor Licensing, for review and authorization. At the same time, the licensee shall notify the N.Y.S. Department of Environmental Conservation of the request. The request shall include an evaluation of the environmental impact of the proposed change and a supporting benefit-cost analysis.

5.6.3.3 When changes or additions to permits and certificates required by Federal, state, local, and regional authorities for the protection of the environment are submitted to the concerned agency for approval, they will also be submitted to the Director for Reactor Licensing, USNRC, for information.

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TABLE 5-1

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

Facility _____ Docket No. _____ Reporting Period _____

A. Sample Results

Sample	Location[3]	Average Quarterly Results[5] Frequency and[6] Type of Samples	Analysis Results[2] (specify radionuclide or entity)	Remarks[1]
(1) External Radiation				
(2) Filterable Airborne				
a. Particulate Filters				
1)				
2)				
etc.				
b. Charcoal Filters				
1)				
2)				
etc.				
(3) Water[4]				
a.				
b.				
etc.				
(4) Food (Human)				
a. Milk				
b.				
etc.				
(5) Other Media				
a. Vegetation (include pasture and other animal foodstuffs)				
b. Soils				
c. Sediments				
d. Fish				
e. Molluscs				
f. Plankton				
g. Algae				
h. etc.				

1/ Explain any unusual measurements or deviation from sampling schedule.

2/ Use the following units; external radiation, mrem/quarter; filterable airborne, water and milk, μCi/ml; soil, μCi/m^2 (specify depth) precipitation, μCi/m^2; stream sediments and terrestrial and aquatic vegetation, μCi/dry g other media, specify units.

3/ Specify location and its distance and direction from the facility, and indicate which is used for background.

4/ Indicate whether precipitation, surface, ground, lake, river, ocean, etc.; specify drinking water.

5/ Use separate table for each quarter.

6/ Type of sample means either grab, continuous, proportional, composite, etc.

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