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NOV 21 1974

Docket Nos. 50-3
and 50-247

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

Dear Mr. Cahill:

In response to your request dated August 2, 1974, the Commission has issued Amendment No. 8 to Provisional Operating License No. DPR-5 for Indian Point Nuclear Generating Unit No. 1 and Amendment No. 10 to Facility Operating License No. DPR-26 for Indian Point Nuclear Generating Unit No. 2. These amendments include Change Nos. 64 and 7 to the Technical Specifications, for Units Nos. 1 and 2, respectively.

These amendments involve an alternative use of an organic, chelate compound (Drewgard 100) to replace potassium chromate as a corrosion inhibitor in the Unit No. 2 Turbine Hall and Instrument Air Closed Cooling Water Systems. You have also supplied additional information, on September 12, 1974, indicating the properties and application of the compound and its toxic effects on aquatic biota. Potassium chromate is still recommended to be used in the Component Cooling Water Systems. The proposed change has been reviewed by your Environmental Protection Committee which has concluded that no significant environmental impact will result from the change.

Copies of the Environmental Evaluation and the Federal Register Notice are also enclosed.

Sincerely,

Original signed by

George E. Lear, Chief
Operating Reactors Branch No. 3
Directorate of Licensing

Enclosures:
1. Amendment No. 8 to DPR-5
2. Amendment No. 10 to DPR-26
3. Environmental Evaluation
4. Federal Register Notice

cc w/enclosures: See next page

OFFICE	L:AD/OR	OGC	L:OR		
	KRGoller	KARMAN	PErickson		
	10/20/74	10/ /74	10/ /74		
OFFICE	L:EP-1	L:EP-1	L:AD/EP	L:OR	
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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. 8
License No. DPR-5

1. The Atomic Energy 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 2, 1974, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended, 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; and

   E. Prior public notice of this amendment is not required since the amendment does not involve a significant hazards consideration.

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. 64.

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

FOR THE ATOMIC ENERGY COMMISSION

Karl R. Goller

Karl R. Goller, Assistant Director
for Operating Reactors
Directorate of Licensing

Attachment:
Change No. 64
to Technical Specifications

Date of Issuance: NOV 21 1974

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 8 TO FACILITY OPERATING LICENSE
NO. DPR-5 CHANGE NO.64 TO TECHNICAL SPECIFICATIONS;

AMENDMENT NO. 10TO PROVISIONAL OPERATING LICENSE
CHANGE NO. 7 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 2-25, 2-38, 2-39, 2-41 and insert the attached pages.

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

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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.

64

64

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 hexavalent 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.

6

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 semiannual operating report.

6

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Change No. 64
Date NOV 21 1974

TABLE 2-1 (Continued)

Parameter Analyzed for	Max. Conc. (ppm)	Collection and Analyses Frequency	Uses of Chemical
Turbidity		WK	
Dissolved Oxygen		WK	
Detergent	1.0	MO	Used for cleaning and laundry
Drewgard 100	2.5	MO (See Note 7)	Used as corrosion inhibitor

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.

7. By calculation of usage.

Change No. 64
Date NOV 21 1974

TABLE 2-2 ANTICIPATED RELEASES

CHEMICAL AND HOW RELEASED	MAXIMUM SUSTAINED RELEASE, (lb/day) Unit No. 1	Unit No. 2	CONCENTRATION WITH DILUTION FLOW OF 100,000 GPM* (ppm) (Column B)	RATIO;**** COLUMN B / COLUMN A (Table 2-1)
(A) Released Continuously				
Phosphate	15	24	3.2×10^{-2}	2.2×10^{-2}
Hydrazine	Na	5	4.2×10^{-3}	4.2×10^{-2}
Cyclohexylamine	2.5	12	1.2×10^{-2}	1.2×10^{-1}
Sodium Hydroxide	36	Na	3.0×10^{-2}	3.0×10^{-3}
(B) Released on the Assumption of System Leakage				
Potassium Chromate (as Chromium)	Na	30	2.5×10^{-1}	5.0×10^{-1}
Drewgard 100+++	Na	132	2.5×10^{0}	Na
(C) Released on a Batch Basis				
Residual Chlorine	----------see text----------			
Detergent	3 (2 hr/day)	Na	3.0×10^{-2}	3.0×10^{-2}
Sodium Hydroxide	120 (1 hr, once a day)***	Na	2.4×10 (2.6×10^{0})**	2.4×10^{-1} (2.6×10^{-1})**
Sulfuric Acid	450 (1 hr, once a day)***	Na	9.0×10^{0}	9.0×10^{-1}

64

Change No. 64
Date NOV 21 1974

TABLE 2-2 ANTICIPATED RELEASES (Continued)

**** This is the ratio of the most adverse concentration (Column B) to the maximum release concentration (Column A). It is an indication of the degree of protection afforded the environment without consideration of normal dilution flow and further dilution in the river itself.

+ Chlorination will not take place at the same time hydrazine is released from Unit No. 1 (once/year).

++ This release (in lbs/day) is based upon the direct release of maximum reactor coolant system concentrations at the maximum rate of the waste disposal system. The occurrence of this release is therefore very unlikely.

+++ Based on discharge of entire system in one hour at a maximum concentration of 2000 ppm.

Change No. 64
Date NOV 21 1974

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. 10
License No. DPR-26

1. The Atomic Energy 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 2, 1974, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended, 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 regulation;

   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; and

   E. Prior public notice of this amendment is not required since the amendment does not involve a significant hazards consideration.

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 Facility 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. 7.

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

FOR THE ATOMIC ENERGY COMMISSION

Karl R. Goller

Karl R. Goller, Assistant Director
for Operating Reactors
Directorate of Licensing

Attachment:
Change No. 7
to Technical Specifications

Date of Issuance: NOV 21 1974

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 10 TO FACILITY OPERATING LICENSE
NO. DPR-26 CHANGE NO. 7 TO TECHNICAL SPECIFICATIONS;

AMENDMENT NO. 8 TO PROVISIONAL OPERATING LICENSE
CHANGE NO. 64 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 2-25, 2-38, 2-39, 2-41 and insert the attached pages.

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 hexavalent 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 semiannual operating report.

Change No. 7
Date NOV 21 1974

TABLE 2-1 (Continued)

Parameter Analyzed for	Max. Conc. (ppm)	Collection and Analyses Frequency	Uses of Chemical	
Turbidity		WK		7
Dissolved Oxygen		WK		
Detergent	1.0	MO	Used for cleaning and laundry	
Drewgard 100	2.5	MO (See Note 7)	Used as corrosion inhibitor	7

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.

7. By calculation of usage.

Change No. 7
Date NOV

TABLE 2-2 ANTICIPATED RELEASES

CHEMICAL AND HOW RELEASED	MAXIMUM SUSTAINED RELEASE, (lb/day) Unit No. 1	Unit No. 2	CONCENTRATION WITH DILUTION FLOW OF 100,000 GPM* (ppm) (Column B)	RATIO;**** COLUMN B / COLUMN A (Table 2-1)
(A) Released Continuously				
Phosphate	15	24	3.2×10^{-2}	2.2×10^{-2}
Hydrazine	Na	5	4.2×10^{-3}	4.2×10^{-2}
Cyclohexylamine	2.5	12	1.2×10^{-2}	1.2×10^{-1}
Sodium Hydroxide	36	Na	3.0×10^{-2}	3.0×10^{-3}
(B) Released on the Assumption of System Leakage				
Potassium Chromate (as Chromium)	Na	30	2.5×10^{-1}	5.0×10^{-1}
Drewgard 100+++	Na	132	2.5×10^{0}	Na
(C) Released on a Batch Basis				
Residual Chlorine	----------see text----------			
Detergent	3 (2 hr/day)	Na	3.0×10^{-2}	3.0×10^{-2}
Sodium Hydroxide	120 (1 hr, once a day)***	Na	2.4×10 (2.6×10^{0})**	2.4×10^{-1} (2.6×10^{-1})**
Sulfuric Acid	450 (1 hr, once a day)***	Na	9.0×10^{0}	9.0×10^{-1}

Change No. 7
Date NOV 21 1974

TABLE 2-2 ANTICIPATED RELEASES (Continued)

**** This is the ratio of the most adverse concentration (Column B) to the maximum release concentration (Column A). It is an indication of the degree of protection afforded the environment without consideration of normal dilution flow and further dilution in the river itself.

+ Chlorination will not take place at the same time hydrazine is released from Unit No. 1 (once/year).

++ This release (in lbs/day) is based upon the direct release of maximum reactor coolant system concentrations at the maximum rate of the waste disposal system. The occurrence of this release is therefore very unlikely.

+++ Based on discharge of entire system in one hour at a maximum concentration of 2000 ppm.

7

Change No. 7
Date NOV 21 1974

ENVIRONMENTAL EVALUATION BY THE DIRECTORATE OF LICENSING

SUPPORTING AMENDMENT NO. 8 TO LICENSE NO. DPR-5

CHANGE NO. 64 TO THE TECHNICAL SPECIFICATIONS

INDIAN POINT NUCLEAR GENERATING UNIT NO. 1 (DOCKET NO. 50-3)

SUPPORTING AMENDMENT NO. 10 TO LICENSE NO. DPR-26

CHANGE NO. 7 TO THE TECHNICAL SPECIFICATIONS

INDIAN POINT NUCLEAR GENERATING UNIT NO. 2 (DOCKET NO. 50-247)

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

Introduction

By letter dated August 2, 1974, Consolidated Edison Company requested a proposed Change No. 5 to the Environmental Technical Specifications appended to Provisional Operating License No. DPR-5 for Indian Point Nuclear Generating Unit No. 1 and Facility Operating License No. DPR-26 for Indian Point Nuclear Generating Unit No. 2. The proposed change involves the alternative use of an organic, chelate chemical (Drewgard 100) to replace potassium chromate as a corrosion inhibitor in the Unit No. 2 Turbine Hall and Instrument Air Closed Cycle Cooling Water Systems. Potassium chromate is still recommended for use in the Component Cooling Water System.

Discussion and Evaluation

1. Composition of Drewgard 100

Commonly used corrosion inhibitors for circulating water systems include various mixtures of zinc, chromate, phosphate (organic or inorganic), sodium silicate, nitrate, borate and organic corrosion inhibitors. The licensee has been using potassium chromate as the corrosion inhibitor in several closed-cycled water systems. On August 9, 1973, the AEC and the New York State Department of Environmental Conservation (NYS DEC) approved the use of hexavalent chromium in these closed-cycle cooling systems, without blowdown, with the provision that no chromium was to be discharged except in the case of accidental leaks. All chromium is required to be treated prior to discharge. The present limit on anticipated releases as

presented in Table 2-2 in the Environmental Technical Specifications is 30 lb/day of potassium chromate from Unit No. 2 at a maximum concentration of 0.05 ppm hexavalent chromium. This concentration is also the Federal drinking water standard.(1)

Chromium compounds have widespread use as corrosion inhibitors but are highly toxic to organisms. See the discussion on toxicity of chromium in Appendix XI-1 in the Final Environmental Statement for Indian Point Unit No. 2.

The licensee now proposes to use an alternative chemical called Drewgard 100 in place of the chromate compound as a corrosion inhibitor. In its August 2, 1974 letter, the licensee further adds the statement, "It becomes immediately apparent, therefore, (a biodegradable material vs a heavy metal compound) that the use of Drewgard 100 is a mitigating measure with respect to the effect of chemical discharges from the Indian Point Station." In the supporting documentation provided by the licensee, however, no chemical composition of Drewgard 100 nor evidence as to its being biodegradable was given. The NYS DEC expressed its concern on this point in a letter dated August 29, 1974, to the AEC. The NYS DEC contacted the manufacturer (Drew Chemical Company) and found out that the chemical is a zinc chelate compound in suspension with surfactants designed to prevent corrosion of iron by other chemicals. The NYS DEC also pointed out that the licensee proposed a maximum discharge concentration of 2.5 ppm of the compound. Because of the lethal effects of zinc at concentrations as low as 0.01 ppm on fish under certain conditions, the NYS DEC recommended that the request of the licensee be denied.

To clarify this discrepancy in the use of Drewgard 100, the licensee wrote the NYS DEC on September 10, 1974, and provided supporting documentation for its use. The licensee supplied information on the general characteristics of the chemical from the Drew Chemical Company, Parsippany, New Jersey, which in turn provided data on toxicity experiments involving the chemical, conducted at TVA, and a letter of approval for its use at the Central Hudson Gas and Electric Company's Roseton Generating Plant by the Industrial Facility Section of the NYS DEC. The manufacturer points out that Drewgard 100 possesses excellent acid corrosion inhibitory properties and mitigates against galvanic attack on multimetal systems. The manufacturer also wrote that zinc is present in Drewgard 100 at less than 0.25% (2500 ppm) as an analytical tracer, but stated that the compound can be made without zinc. The industrial Facility Section of the NYS DEC also recommended that at Roseton, Drewgard 100 at 2000 ppm be segregated and treated for zinc removal in the existing waste water treatment facilities before discharge.

The licensee proposes to use 2000 ppm of Drewgard 100 in the Unit No. 2 Turbine Hall and Instrument Air Closed-Cycle Cooling System (total volume of 7900 gallons). This concentration would give 5.0 ppm of zinc present in the closed cycle cooling systems. Leakage of this compound to the discharge canal would result in a maximum zinc concentration of 0.012 ppm, assuming a minimum flow of 100,000 gpm in the once-through cooling system. The concentration of 0.012 ppm is about the same as the 0.013 ppm of the natural river background concentration. See Table XIII in Appendix Z of the Environmental Report for Indian Point Unit No.3.

On September 18, 1974, the manufacturer provided the Atomic Energy Commission upon request with a copy of the patent(2) on the product. The chemical contains four components: (1) a glycine, (2) chelating agent, (3) phosphoric or boric acid ester and (4) a water soluble divalent metal salt. The divalent metal ions may be derived from any water soluble salt of zinc, cadmium, copper, nickel, strontium and mixtures thereof. The concentration of the divalent metal ion should be within the range 0.5 to about 5 parts per 100 parts of total composition. This is equivalent to 5000 to 50,000 ppm of the divalent metal such as zinc in Drewgard 100 or more than double the concentration discussed above.

The chelating agent can be represented in the following classes of organics: (1) polycarboxylicpolyamine compounds, (2) hydroxypoly-carboxcyclic acids, (3) nitrilo polyacetic acids, and (4) aminoalkylphosphonic acids, and salts thereof. In the first class, ethylenediamine tetraacetic acid (EDTA) is a typical example. The second class could be citric, tartaric, or gluconic acids. An example for the third class includes nitrilodiacetic acid and that for the fourth class, amino lower alkylphosphonic acid. The chelating agents are used in the range of about 2.5 to about 15 parts by weight of 100 parts of Drewgard 100. This is equivalent to 25,000 ppm of the chelating agent of the total composition of Drewgard 100.

The third component of Drewgard 100 is a trivalent acid ester containing phosphorus or boron in the trivalent state which has reacted with a compound having at least one available hydroxyl group such as ethylene glycol, triethanol amine, or ethoxylated fatty acids. The trivalent acid ester is used in the range of about

7.5 to about 30 parts by weight per 100 parts of total composition. This concentration becomes 75,000 to 300,000 ppm of the ester in Drewgard 100.

The fourth component, a glycine or amino acid derivative, could be typically sodium alkylsulfonyl glycine, or N-paratoluenesulfonylglycine, or glycine. The concentration ranges from 50 to 89.5 parts per 100 parts of Drewgard 100 or 500,000 to 895,000 ppm.

The composition of Drewgard 100 is summarized below:

	Component	Parts Per Hundred
(1)	N-alkyl sulfonyl glycine	50 to 89.5
(2)	E.D.T.A.	2.5 to 15
(3)	Phosphoric acid ester of octyl alchol	7.5 to 30
(4)	Zinc sulfate monohydrate	0.5 to 5

At a concentration of 2000 ppm in the 7900 gallon closed cycle cooling system, the zinc concentration could be as high as 130 ppm, assuming that zinc is about 30% of zinc sulfate monohydrate. This is six times higher than that mentioned above. At the requested maximum permissible concentration of 2.5 ppm Drewgard 100 in the discharge canal, the maximum zinc concentration of 0.38 ppm would be discharged to the river, if the discharge would be permitted.

2. Bioassay tests on Drewgard 100

Bioassay tests carried out by W. H. Peltier at TVA on Chlorella (phytoplankter), Daphnia pulex (macroscopic zooplankter), and bluegill sunfish indicate that Drewgard 100 does not appear to have an acute toxic effect at 2.5 ppm upon these test organisms. The 96 hour LC_{50} on bluegill sunfish was found to be 570 ppm.

The licensee also provided a report entitled, "Bioassay of Drewgard 100 on Striped Bass (morone saxatilis)" prepared by Texas Instruments, Inc., dated September 24, 1973. The acute toxicity (48 hour and 96 hour LD_{50}) of Drewgard 100 on 60 to 100 mm young-of-the-year striped bass was determined in exploratory and full-scale bioassay

tests. In the exploratory tests, the 48 hour LC_{50} was calculated to be approximately 75 ppm. Applying a 1/10 safety factor, one obtains a value of 7.5 ppm. The full-scale tests showed the 48-hour LC_{50} to be 108 ppm and 144 ppm, and applying the 1/10 safety factor, the 1/10 LC_{50} for 48 hours and 96 hours becomes 10.8 and 14.4 ppm, respectively.

Based on these tests, the licensee recommends that the maximum discharge concentration of 2.5 ppm of Drewgard 100 be used. This is 1/30 of the LC_{50} and is well below the guidelines for establishing safe limits.

During the tests, the temperature up to 81°F, dissolved oxygen (D.O.), hydrogen ion (pH), total dissolved solids, and salinity were measured and recorded. It was found that mild aeration was necessary to maintain D.O. within acceptable levels since the unfiltered river water and Drewgard 100 dramatically lowered the D.O. level. Drewgard 100 also produced an oxygen demand capable of reducing the D.O. level in mildly aerated river water to less than 0.5 ppm in 24 hours. Difficulties in changing air pressure for aeration occurred during the bioassay tests. These difficulties could have affected the accuracy of the results.

The results indicated a possible bias or an interaction effect in that an intermediate concentration of 115 ppm for the LC_{50} was found to be more lethal than either of the extreme concentrations tested (56 ppm and 180 ppm).

The above bioassay tests were designed to determine the acute effect, but chronic effects may occur at a much lower concentration.

Zinc is considered to be extremely toxic toward fish.[3] Zinc is believed to exert its toxic action by forming insoluble compounds with the mucus that covers the gills, by damage to the gill epithelium, or possibly as an internal poison. Sensitivity of fish to zinc varies with the species, age, and condition of the fish, as well as the physical and chemical characteristics of the water. Zinc can be concentrated in fish, as for example, zinc levels in Columbia River fish were 1000 to 2000 times the levels found in the water.[4] However, calcium reduces zinc toxicity. For mature fish, the lethal limit for zinc in water containing 1 ppm of calcium was 0.3 ppm, but in water with 50 ppm of calcium, as much as 2.0 ppm of zinc was not toxic.[3] The average calcium content of Hudson River water near Indian Point is on the average about 36 ppm. See Table III-15 in the Final Environmental Statement for Indian Point Unit No. 2 for the chemical composition of the river water.

Hughes (1969) found that 24 hr-TLm for roccus saxatilis larvae is 0.5 ppm for zinc, and for juveniles, the 48 to 96 hr-Tlm, acute is 0.10 ppm for zinc. The 1/10 safe limit would be 0.01 ppm, which is comparable to the natural Hudson River background level. Additional information on the toxicity of zinc is tabulated in the AEC report, "Toxicity of Power Plant Chemicals to Aquatic Life," WASH-1249, June 1973.

The staff has reviewed the information on Drewgard 100 and believes that the Drewgard 100 can be used only in the closed-cycle cooling system, without blowdown. The inhibitor, however, should not exceed the recommended 2000 ppm concentration in these systems and must be segregated and treated for zinc removal in waste water treatment facilities before discharge. The maximum concentration of Drewgard 100 in the discharge canal shall be limited to 2.5 ppm. It is estimated that 48,000 lbs/year of Drewgard 100 will be discharged. From this, about 2400 lbs/yr of zinc will have to be removed prior to discharge.

Since the manufacturer can supply the compound without the zinc tracer, the staff will require that this composition be used, once an analytical procedure for the non-zinc containing Drewgard 100 is developed. The licensee wrote in his letter of September 10, 1974, to the NYS DEC that in the future Drewgard 100 will be supplied without zinc, once other tests are available for analyzing Drewgard 100.

The licensee shall, therefore, provide the Directorate of Licensing within six months of the date of the issuance of this technical specification change, a report to indicate that an analytical procedure is now in use in determining the other components of Drewgard 100 and that Drewgard 100 without zinc or other heavy metal compound is in use as a corrosion inhibitor in the closed-cycle cooling systems.

A correction in Table 2-1, page 2-38, was made by deletion of 0.5 ppm of dissolved oxygen since there is no release of dissolved oxygen from the plant.

Conclusions

Based on the above discussion and evaluation, we have concluded that the licensee's proposed Change No. 5 to Appendix B as presented in Enclosure 1 with modifications is approved for environmental considerations and allows the licensee to use Drewgard 100 in place of

potassium chromate as a corrosion inhibitor in the Unit No. 2 Turbine Hall and Instrument Air Closed-Cycle Cooling Water Systems under the conditions of zinc removal prior to discharge. No zinc or heavy metal compound shall be discharged into the Hudson River. Since no safety related systems are affected by this change, we conclude that the licensee's proposed Change No. 5 does not involve significant hazards considerations. We have also concluded that there is reasonable assurance: (1) that activities authorized by this amendment can be conducted without endangering the health and safety of the public; and (2) that such activities will be conducted in compliance with the Commission's regulations.

Mary Jane Oestmann

Mary Jane Oestmann, Project Manager
Environmental Projects Branch No. 1
Directorate of Licensing

George W. Knighton

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

NOV 21 1974

REFERENCES

1. U. S. Department of Interior, "Water Quality Criteria," Federal Water Pollution Control Administration, Washington, D.C., 1968.

2. Drewgard 100 Corrosion Inhibitor, U. S. Patent Office, No. 3,699,052, Patented October 17, 1972, presented in a letter dated September 18, 1974 from S. D. Curtis, Drew Chemical Corporation, to M. J. Oestmann, Directorate of Licensing, U. S. Atomic Energy Commission.

3. McKee, J. E., and Wolf, H. W., "Water Quality Criteria," Second Edition, California Water Quality Control Bd., Publ. No. 3-A, 1963.

4. Watson, D. G., et al, "Radioecological Studies on the Columbia River," Battelle Northwest Laboratories, Richland, Washington, BNWL-1377, UC-48, 1970.

UNITED STATES ATOMIC ENERGY 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. Atomic Energy Commission (the Commission) has issued Amendment No. 8 to Provisional Operating License No. DPR-5 for Indian Point Nuclear Generating Unit No. 1, and Amendment No. 10 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 permit the licensee to use an alternate corrosion inhibitor, Drewgard 100, in place of a heavy metal corrosion inhibitor, potassium chromate, in certain closed cycle cooling water systems. The maximum concentration of the Drewgard 100 discharged to the Hudson River from accidental leakages will be limited to 2.5 parts per million. Supporting documentation on the acute toxicity of the compound from bioassay tests indicates that at this concentration no significant impact on the Hudson River ecosystem will occur.

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.

For further details with respect to these actions, see: (1) the application for the amendments dated August 2, 1974; (2) Amendment No. 8 to License No. DPR-5 with its attachment, Change No. 64 ; (3) Amendment No. 10 to License No. DPR-26 with its attachment Change No. 7 and (4) the Commission's related Environmental Evaluation.

All of the above items are available for public inspection at the Commission's Public Document Room, 1717 H Street, NW., Washington, D. C. 20545 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) through (4) may be obtained upon request addressed to the United States Atomic Energy Commission, Washington, D. C. 20545, Attention: Deputy Director for Reactor Projects, Directorate of Licensing, Regulation

Dated at Rockville, Maryland, this 21st day of November 1974.

FOR THE ATOMIC ENERGY COMMISSION

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