

Indian Point 3  
Nuclear Power Plant  
P.O. Box 215  
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L. M. Hill  
Resident Manager

August 24, 1994  
IPN-94- 108

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Stop PI-137  
Washington, D.C. 20555

SUBJECT: Indian Point 3 Nuclear Power Plant  
Docket No. 50-286  
License No. DPR-64  
Effluent and Waste Disposal Semi-Annual Report for  
The Period January 1, 1994 through June 30, 1994

Dear Sir:

Enclosed is the Semi-Annual Report of Radioactivity in Solid Wastes and Releases of Radioactive Material in Liquid and Gaseous Effluents for Indian Point 3 as required by Section 5.3.3.1 of the Environmental Technical Specifications. The enclosed report covers the period January 1, 1994 through June 30, 1994 for Indian Point 3 and would include those releases from Indian Point 2 resulting from processing liquid waste from Indian Point 3 if this pathway was utilized. During this reporting period, no waste was transferred from Unit 3 to Unit 2.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'L. M. Hill', written over the printed name.

L. M. Hill  
Resident Manager  
Indian Point 3 Nuclear Power Plant

Attachment

cc: See next page

9408300276 940630  
PDR ADDCK 05000286  
R PDR

JEH

cc: Mr. Thomas T. Martin  
Regional Administrator  
Region I  
U.S. Nuclear Regulatory Commission  
475 Allendale Road  
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U.S. Nuclear Regulatory Commission  
Resident Inspectors' Office  
Indian Point 3 Nuclear Power Plant

Effluent and Waste Disposal

Semi-Annual Report

January 1, 1994 - June 30, 1994

Facility Indian Point 3

Licensee New York Power Authority

This information is provided in accordance with the requirements of Regulatory Guide 1.21. The numbered sections of this report reference corresponding sections of the subject Regulatory Guide, pages 1.21-10 to 12. The Authority is making no commitments in this submittal.

A. Supplemental Information

1. Regulatory Limits

Indian Point 3 is presently subject to limits on radioactive waste releases that are set forth in sections 2.3.1, 2.3.2, 2.3.3, 2.4.1, 2.4.2, 2.4.3 and 2.4.4 of Appendix B to Docket No. 50-286 entitled "Environmental Technical Specification Requirements Part II Radiological Environmental" (ETSR). The percentages of the technical specification limits reported in Tables 1A and 2A are the percent of the quarterly limits specified in the ETSR. If more than one limit applies to the release, the most restrictive limit is reported.

2. Maximum Permissible Concentration

a) Fission and Activation Gases

The quarterly dose resulting from release of fission and activation gases is calculated in accordance with the methodology stated in the Offsite Dose Calculation Manual (ODCM). The specific isotopes listed in Table 1C are used to determine the effective dose factors for the time period.

b/c) Iodines, Tritium and Particulates

The quarterly organ dose limit for Iodine 131, tritium and particulates with half-lives greater than eight days is calculated in accordance with the methodology stated in the ODCM.

d) Liquid Effluents

The quarterly dose limit for liquid isotopic releases is calculated in accordance with the methodology stated in the ODCM. The concentration limit for noble gases dissolved in liquid releases is calculated based upon a maximum permissible concentration of  $2.00\text{E-}4$  uCi/ml as required by section 2.3.1.A of the ETSR.

3. Average Energy

The average energies ( $\bar{E}$ ) of the radionuclide mixture in releases of fission and activation gases were as follows:

1st Quarter	$E_{\beta} = 0.00E-00$	Mev/dis	$E_{\gamma} = 0.00E-00$	Mev/dis
2nd Quarter	$E_{\beta} = 0.00E-00$	Mev/dis	$E_{\gamma} = 0.00E-00$	Mev/dis

There were no Noble Gas releases in the first and second quarter, 1994, due to the extended shutdown of the facility.

4. Measurements and Approximations of Total Radioactivity

a) Fission and Activation Gases

Analysis of effluent gases has been performed in compliance with the requirements of Table 3.4-1 of the ETSR. In the case of isolated tanks (batch release) the total activity discharged is based on an isotopic analysis of each batch with the volume of gas in the batch corrected to standard temperature and pressure.

Vapor containment purge discharges that are less than 150 hours/quarter in duration have been treated as batch releases and Vapor Containment pressure relief discharges have been treated as continuous releases (> 500 hrs/year and as defined in NUREG 0133, Section 3.3). At least one complete isotopic concentration analysis of containment air is performed monthly. This analysis is used in conjunction with a process monitor to obtain the isotopic mixture and quantification of each pressure relief. Isotopic analyses for each vapor containment purge are taken prior to and during the purge. This information is combined with the volume of air in each discharge to calculate the quantity of activity released from these discharges.

The continuous building discharges are based on weekly samples of ventilation air for isotopic content. This information is combined with total air volume discharged and the process radiation monitor readings to determine the quantity of activity from continuous discharges.

b/c) Iodines and Particulates

Iodine-131 and particulate releases are quantified by collecting a continuous sample of ventilation air on a TEDA impregnated, activated charcoal cartridge and a glass-fiber filter paper. These samples are changed weekly as required in Table 3.4-1 of the ETSR and the concentration of isotopes found by analysis of these samples is combined with the volume of air discharged during the sampling period to calculate the quantity of activity discharged.

For other iodine isotopes the concentration of each isotope is determined monthly on a 24-hour sample. The concentration of the isotopes found by analysis is combined with the volume of air discharged during the sampling period to calculate the quantity of activity discharged.

d) Liquid Effluents

A sample of each batch discharge is taken and an isotopic analysis is performed in compliance with requirements specified in Table 3.3-1 of the ETSR. This isotopic concentration data is combined with the information on volume discharged to determine the amount of each isotope discharged.

Proportional composite samples of continuous discharges are taken and analyzed in compliance with Table 3.3-1 of the ETSR. This concentration data is combined with the volume discharged to calculate the total activity discharged.

5. Batch Releases

a) Liquid

						<u>1994</u>	
						<u>1st Quarter</u>	<u>2nd Quarter</u>
Number of Batch Releases						11	14
Total Time Period Batch Releases (Min)						1347	2268
Maximum	"	"	"	"	"	160	275
Average	"	"	"	"	"	122	162
Minimum	"	"	"	"	"	81	125
Average Stream Flow (cfs)						Note: *	Note: *

Note:\*

This information is obtained from the Department of the Interior, U.S. Geological Survey, for the Hudson River. Due to the delays in obtaining this data from the governmental agency, flows will be submitted as they become available.

b) Gaseous

Number of Batch Releases						0	0
Total Time Period Batch Releases (Min.)						N/A	N/A
Maximum	"	"	"	"	"	N/A	N/A
Average	"	"	"	"	"	N/A	N/A
Minimum	"	"	"	"	"	N/A	N/A

6. Abnormal Releases

- a) Liquid  
None
- b) Gaseous  
None

7. Radiological Environmental Technical Specifications

The Radiological Environmental Technical Specifications require reporting of prolonged outages of effluent monitoring equipment (Sections 2.1.C and 2.2.B) and significant changes in the land use census, Radiological Environmental Monitoring Program (REMP), or exceeding the total curie content limitations in outdoor tanks (Sections 2.8.A, 2.8.B, 2.7.C and 2.3.4.B).

During this reporting period, the following Technical Specification Effluent Monitoring equipment was out of service (OOS) for periods greater than 30 consecutive days:

Radiation Monitor	Days OOS	Reason for out of service condition
R-16A/B	37 days	During planned maintenance on a sample delivery valve (SWN-51-1), an additional failed isolation valve (SWN-51-5) was discovered, requiring parts for corrective maintenance.
R-19	50 days	Vendor 10CFR21 issue involving monitor's microprocessor, followed by a refueling calibration failure requiring troubleshooting, repair, and re-performance of the refueling calibration test.
R-59	81 days	Vendor 10CFR21 issue involving monitor's microprocessor, followed by a discovered insufficient sample flow problem requiring continued troubleshooting.
Waste Gas O <sub>2</sub> Analyzer	181 days	This portion of the explosive gas monitoring system was out of service for a planned upgrade (MOD # 94-3-011WGA) due to obsolete failed equipment no longer supported by the vendor. The modification was completed June 30, 1994.
Waste Gas H <sub>2</sub> Analyzer	44 days	The H <sub>2</sub> instrument was out of service for the modification described above, but only during the interval required to perform the actual system upgrade.

Indian Point 3  
EFFLUENT AND WASTE DISPOSAL  
SEMI-ANNUAL REPORT  
  
B. GASEOUS EFFLUENTS  
FIRST AND SECOND QUARTERS, 1994

TABLE 1A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (Jan - Jun 1994)

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	UNIT	QUARTER 1st	QUARTER 2nd	EST. TOTAL ERROR %
A. Fission & Activation Gases				
1. Total Release	Ci	0.00E+00	0.00E+00	N/A
2. Average release rate for period	uCi/sec	0.00E+00	0.00E+00	
3. Percent of technical spec. limit	%	0.00E+00	0.00E+00	
B. Iodines				
1. Total Iodine - 131	Ci	0.00E-00	0.00E-00	N/A
2. Average release rate for period	uCi/sec	0.00E-00	0.00E-00	
C. Particulates				
1. Total release with $T_{1/2} > 8$ days	Ci	1.04E-06	1.00E-07	2.50E+01
2. Average release rate for period	uCi/sec	1.34E-07	1.27E-08	
3. Gross alpha radioactivity	Ci	<3.29E-07	<3.03E-07	
D. Tritium				
1. Total release	Ci	2.59E-01	2.27E-01	2.50E+01
2. Average release rate for period	uCi/sec	3.33E-02	2.89E-02	
E. Percent of Tech Spec Limit Iodines, Particulate with $T_{1/2} > 8$ days, & Tritium				
	%	5.93E-04	4.68E-04	2.50E+01



TABLE 1C  
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (Jan - Jun 1994)  
GASEOUS EFFLUENTS-GROUND RELEASES

Nuclides Released	Unit	CONTINUOUS MODE		BATCH MODE	
		1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1) Fission Gases					
Krypton (Kr) 85m	Ci				
Krypton (Kr) 85	Ci				
Krypton (Kr) 87	Ci				
Krypton (Kr) 88	Ci				
Xenon (Xe) 131m	Ci				
Xenon (Xe) 133m	Ci				
Xenon (Xe) 133	Ci				
Xenon (Xe) 135m	Ci				
Xenon (Xe) 135	Ci				
Xenon (Xe) 138	Ci				
Argon (Ar) 41	Ci				
<b>TOTAL FOR PERIOD</b>	<b>Ci</b>	<b>0.00E-00</b>	<b>0.00E-00</b>	<b>0.00E-00</b>	<b>0.00E-00</b>
2) Iodines					
Iodine (I) 131	Ci				
Iodine (I) 133	Ci				
Iodine (I) 135	Ci				
<b>TOTAL FOR PERIOD</b>	<b>Ci</b>	<b>0.00E-00</b>	<b>0.00E-00</b>		

TABLE 1C  
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (Jan - Jun 1994)  
GASEOUS EFFLUENTS - GROUND RELEASES

Nuclides Released	Unit	CONTINUOUS MODE		BATCH MODE	
		1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
3) Particulates					
Antimony (Sb) 125	Ci				
Barium (Ba) 133	Ci				
Cadmium (Cd) 109	Ci				
Cerium (Ce) 139	Ci				
Cerium (Ce) 141	Ci				
Cerium (Ce) 144	Ci				
Cesium (Cs) 134	Ci				
Cesium (Cs) 137	Ci	1.04E-06	1.00-07		
Cobalt (Co) 57	Ci				
Cobalt (Co) 58	Ci				
Cobalt (Co) 60	Ci				
Chromium (Cr) 51	Ci				
Niobium (Nb) 95	Ci				
Strontium (Sr) 89	Ci				
Strontium (Sr) 90	Ci				
Tin (Sn) 113	Ci				
<b>TOTAL</b>	<b>Ci</b>	<b>1.04E-06</b>	<b>1.00E-07</b>		

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EFFLUENT AND WASTE DISPOSAL  
SEMI-ANNUAL REPORT  
  
C. LIQUID EFFLUENTS  
FIRST AND SECOND QUARTERS, 1994

TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (Jan - Jun 1994)

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	UNITS	QUARTER 1st	QUARTER 2nd	EST. TOTAL ERROR %
A. Fission and activation products				
1. Total release (not including tritium, gases, alpha)	Ci	2.29E-02	2.19E-02	2.50E+01
2. Average diluted concentration during period	uCi/ml	1.59E-10	1.30E-10	
B. Tritium				
1. Total release	Ci	2.05E-00	9.17E-01	2.50E+01
2. Average diluted concentration during period	uCi/ml	1.42E-08	5.46E-09	
C. Dissolved and entrained gases				
1. Total release	Ci	0.00E-00	0.00E-00	N/A
2. Average diluted concentration during period	uCi/ml	0.00E-00	0.00E-00	
D. Gross alpha radioactivity				
1. Total release	Ci	<1.23E-05	<1.77E-05	2.50E+01
E. Volume of waste released (prior to dilution)				
	liters	3.07E+05	4.28E+05	1.00E+01
F. Volume of dilution water used during period				
	liters	1.44E+11	1.68E+11	1.00E+01
G. Percent of liquid effluent limit				
	%	5.62E-02	4.36E-02	2.50E+01

TABLE 2B  
LIQUID EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (Jan - Jun 1994)

<u>Nuclides Released</u>	<u>Unit</u>	<u>CONTINUOUS MODE</u>		<u>BATCH MODE</u>	
		<u>1st Quarter</u>	<u>2nd Quarter</u>	<u>1st Quarter</u>	<u>2nd Quarter</u>
Antimony (Sb) 124	Ci			3.28E-05	
Antimony (Sb) 125	Ci			4.59E-04	2.04E-04
Cobalt (Co) 57	Ci			7.54E-06	4.75E-06
Cobalt (Co) 58	Ci			3.77E-04	8.14E-05
Cobalt (Co) 60	Ci			5.36E-03	6.43E-03
Iron (Fe) 55	Ci			8.05E-03	7.60E-03
Manganese (Mn) 54	Ci			3.07E-04	3.94E-04
Nickel (Ni) 63	Ci			8.29E-03	7.18E-03
<u>TOTAL FOR PERIOD</u>		<u>0.00E-00</u>	<u>0.00E-00</u>	<u>2.29E-02</u>	<u>2.19E-02</u>

<u>Nuclides</u>	<u>Unit</u>	<u>CONTINUOUS MODE</u>		<u>BATCH MODE</u>	
		<u>1st Quarter</u>	<u>2nd Quarter</u>	<u>1st Quarter</u>	<u>2nd Quarter</u>
<u>TOTAL DISSOLVED AND</u> <u>ENTRAINED GASES</u>	<u>Ci</u>	<u>0.00E-00</u>	<u>0.00E-00</u>	<u>0.00E-00</u>	<u>0.00E-00</u>

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SEMI-ANNUAL REPORT

D. SOLID WASTE FIRST AND SECOND QUARTERS, 1994

TABLE 3  
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT  
January 1 - June 30, 1994  
SOLID WASTE SHIPMENTS

## A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of Waste	Unit	6 Month Period			Est. Total Error, %
		Class A	Class B	Class C	
a. Spent resins, filter sludges, etc.	m <sup>3</sup>	4.5E+0	0		
	Ci	1.3E+0	0	0	±25
b. Dry compressible, contam. equipment for burial	m <sup>3</sup>	5.6E+0	0	0	
	Ci	4.4E-3	0	0	±25
c. Irradiated Components	m <sup>3</sup>	0	0	0	
	Ci	0	0	0	N/A
d. Other: Dry compressible, contaminated equip. for volume reduction at offsite facility	m <sup>3</sup>	5.0E+1	0	0	
	Ci	4.6E-2	0	0	±25

## 2. Estimate of major nuclide composition (by type of waste)

NUCLIDE	UNIT	Resin	Dry Burial	Dry Vol. Red
		CLASS A	CLASS A	CLASS A
H-3	%	1.6	0.1	0.1
C-14	%	4.7	2.3	2.4
Mn-54	%	0.2	1.6	1.6
Fe-55	%	42.5	54.3	54.4
Co-58	%	-	2.8	2.5
Co-60	%	22.4	28.1	28.2
Ni-59	%	0.1	0.2	0.2
Ni-63	%	16.6	-	-
Sb-125	%	1.4	1.1	1.1
Cs-134	%	4.6	1.9	1.9
Cs-137	%	5.7	7.5	7.6

Percentages of nuclides and total activities are based on a combination of direct measurements and scaling for non-gamma emitting nuclides.

## 3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transport</u>	<u>Destination</u>
1	Truck	Barnwell, SC
1	Truck	SEG, Oak Ridge TN: for volume reduction.

## 4. Containers Shipped

<u>Container</u>	<u>Number</u>	<u>Class A</u>	<u>Class B</u>		<u>Class C</u>	
		<u>Solid. Media</u>	<u>Number</u>	<u>Solid. Media</u>	<u>Number</u>	<u>Solid Media</u>
For Burial:						
Poly HIC	1	None	0	N/A	0	N/A
Drums	0	N/A	0	N/A	0	N/A
Steel Liner	0	N/A	0	N/A	0	N/A
Crates	2	None	0	N/A	0	N/A

For Volume  
Reduction:

SeaLand Cont.	1	N/A	0	N/A	0	N/A
Crates	5	N/A	0	N/A	0	N/A

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

E. RADIOLOGICAL IMPACT ON MAN

FIRST AND SECOND QUARTERS, 1994

(not required to be submitted during this reporting period)



Indian Point 3  
EFFLUENT AND WASTE DISPOSAL  
SEMI-ANNUAL REPORT

F. METEOROLOGICAL DATA

FIRST AND SECOND QUARTERS, 1994

(not required to be submitted during this reporting period)

Indian Point 3  
EFFLUENT AND WASTE DISPOSAL  
SEMI-ANNUAL REPORT

G. OFFSITE DOSE CALCULATION MANUAL OR  
PROCESS CONTROL MANUAL CHANGES

FIRST AND SECOND QUARTERS, 1994

(There were no revisions to the ODCM or PCP  
during this reporting period)