Indian Point 3
Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511
914 736.8001

New York Power Authority

Joseph E. Russell
Resident Manager

August 29, 1990

IP3-90-057
90-IP3-135N

Docket #50-286
License No. DPR-64

Mr. Thomas Martin
Regional Administrator
Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pa. 19406

Dear Mr. Martin:

Enclosed is the Semi-Annual Report of Radioactivity in Solid Wastes and Releases of Radioactive Materials 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, 1990 through June 30, 1990 for Indian Point 3 and includes those releases from Indian Point 2 which resulted from processing liquid waste from Indian Point 3 when this pathway is utilized.

Joseph E. Russell
Resident Manager
Indian Point 3 - Nuclear Power Plant

JER/MK/mm
Encs.

cc: Document Control Desk (original)
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Indian Point No. 3 Resident Inspector's Office

Resident Inspector's Office
Indian Point 3
US Nuclear Regulatory Commission

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Effluent and Waste Disposal

Semi-Annual Report

January 1, 1990 - June 30, 1990

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.

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 #50-286 entitled "Environmental Technical Specification Requirements Part II Radiological Environmental". 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 Off Site 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 2.00E-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_β = 1.44E-01	or Mev/dis	$E\gamma$ = 5.27E-02	Mev/dis
2nd Quarter	E_β = 1.59E-01	or Mev/dis	$E\gamma$ = 7.10E-02	Mev/dis

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 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 a 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 or 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

	1990 1st Quarter	2nd Quarter
Number of Batch Releases	28	47
Total Time Period Batch Releases (Min.)	4027	6269
Maximum " " " " " "	240	220
Average " " " " " "	144	133
Minimum " " " " " "	110	100
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 are submitted as they become available.

Year	Quarter	Flow (ft^3/sec)
1987	Fourth	22300
1988	First	19967
1988	Second	15783
1988	Third	6830

b) Gaseous

Number of Batch Releases	15	5
Total Time Period Batch Releases (Min.)	12698	1255
Maximum " " " " "	9688	295
Average " " " " "	847	251
Minimum " " " " "	20	215

6. Abnormal Releases

a) Liquid
None

b) Gaseous
None

7. Radiological Environmental Technical Specifications

The Radiological Environmental Technical Specifications require reporting of prolonged outage of effluent monitoring equipment (Sections 2.1.C and 2.2.B) and significant changes in the land use census, Radiological Environmental Monitoring Program 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 effluent monitoring equipment was out of service:

Waste Gas Holdup System Monitor (R-20)

This monitor was out of service during this reporting period for 109 days. This outage was due to extensive damage to the detector system and long lead time for procurement of spare parts. Monitor replacement is being pursued and will eliminate repetitive failures.

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

B. GASEOUS EFFLUENTS

FIRST AND SECOND QUARTERS 1990

TABLE 1A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	UNIT	QUARTER 1st	QUARTER 2nd	EST.TOTAL Error %
A. Fission & Activation Gases				
1. Total Release	Curies	1.77E+02	9.77E+01	2.50E+01
2. Average release rate for period	uCi/sec	2.28E+01	1.24E+01	
3. Percent of technical spec. limit	%	1.89E-00	1.15E-00	
B. Iodines				
1. Total Iodine - 131	Ci	4.06E-05	1.12E-05	2.50E+01
2. Average release rate for period	uCi/sec	5.22E-06	1.43E-06	
C. Particulates				
1. Particulates with half-lives >8 days	Ci	1.33E-05	7.32E-06	2.50E+01
2. Average release rate for period	uCi/sec	1.71E-06	9.31E-07	
3. Gross alpha radioactivity	Ci	<2.83E-07	<3.03E-07	
D. Tritium				
1. Total release	Ci	1.61E-00	4.69E-01	2.50E+01
2. Average release rate for period	uCi/sec	2.08E-01	6.04E-02	
E. Percent of Tech Spec Limit Iodines, Particulate, & Tritium	%	9.57E-01	5.05E-03	2.50E+01

TABLE 1C
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)
GASEOUS EFFLUENTS-GROUND RELEASES

Nuclides Released	Unit	CONTINUOUS MODE 1st Quarter	CONTINUOUS MODE 2nd Quarter	BATCH MODE 1st Quarter	BATCH MODE 2nd Quarter
1) Fission Gases					
Krypton (Kr) 85m	Ci	5.45E-02	3.78E-01	5.09E-02	1.22E-03
Krypton (Kr) 85	Ci	1.21E-00	4.00E-01	2.09E-00	8.55E-01
Krypton (Kr) 87	Ci		6.90E-04		
Krypton (Kr) 88	Ci		9.05E-03		
Xenon (Xe) 131m	Ci	4.07E-01	4.70E-01	7.24E-01	1.98E-01
Xenon (Xe) 133m	Ci	2.27E-01	4.56E-01	5.85E-01	3.13E-03
Xenon (Xe) 133	Ci	1.17E+02	8.23E+01	4.82E+01	6.81E-01
Xenon (Xe) 135m	Ci				
Xenon (Xe) 135	Ci	5.14E+00	1.19E+01	1.37E-00	1.04E-02
Xenon (Xe) 138	Ci				
Argon (Ar) 41	Ci	3.47E-02	4.32E-02		5.21E-04
TOTAL FOR PERIOD	Ci	1.24E+02	9.60E+01	5.30E+01	1.75E+00
2) Iodines					
Iodine (I) 131	Ci	4.06E-05	1.12E-5		
Iodine (I) 133	Ci				
Iodine (I) 135	Ci				
TOTAL FOR PERIOD	Ci	4.06E-05	1.12E-05	0.00E-00	0.00E-00

TABLE 1C
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)
GASEOUS EFFLUENTS - GROUND RELEASES

Nuclides Released	Unit	CONTINUOUS MODE 1st Quarter	CONTINUOUS MODE 2nd Quarter	BATCH MODE 1st Quarter	BATCH MODE 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	2.01E-06	3.14E-06		
Cobalt (Co) 57	Ci				
Cobalt (Co) 58	Ci	1.13E-05	4.17E-06		
Cobalt (Co) 60	Ci				
Chromium (Cr) 51	Ci				
Iron (Fe) 55	Ci				
Niobium (Nb) 95	Ci				
Strontium (Sr) 89	Ci				
Strontium (Sr) 90	Ci				
Tin (Sn) 113	Ci				
TOTAL	Ci	1.33E-05	7.32E-06		

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

C. LIQUID EFFLUENTS

FIRST AND SECOND QUARTERS, 1990

TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

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	3.73E-02	5.79E-02	2.50E+01
2. Average diluted concentration during period	uCi/ml	1.97E-10	2.60E-10	
B. Tritium				
1. Total release	Ci	9.67E+01	1.15E+02	2.50E+01
2. Average diluted concentration during period	uCi/ml	5.10E-07	5.15E-07	
C. Dissolved and entrained gases				
1. Total release	Ci	1.04E-01	1.34E-01	2.50E+01
2. Average diluted concentration during period	uCi/ml	5.50E-10	6.03E-10	
D. Gross alpha radioactivity				
1. Total release	Ci	<3.18E-05	<6.81E-05	2.50E+01
E. Volume of waste released (prior to dilution)	liters	9.50E+05	1.59E+06	1.00E+01
F. Volume of dilution water used during period	liters	1.90E+11	2.23E+11	1.00E+01
G. Percent of liquid effluent limit	%	5.56E-01	3.43E-01	2.50E+01

TABLE 2B
LIQUID EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1990)

Nuclides Released	Unit	CONTINUOUS MODE 1st Quarter	CONTINUOUS MODE 2nd Quarter	BATCH MODE 1st Quarter	BATCH MODE 2nd Quarter
Antimony (Sb) 122	Ci				
Antimony (Sb) 124	Ci			1.46E-04	
Antimony (Sb) 125	Ci			2.59E-03	
Beryllium (Be) 7	Ci			4.61E-04	
Barium (Ba) 140	Ci				
Cadmium (Cd) 109	Ci				
Cerium (Ce) 139	Ci				
Cerium (Ce) 141	Ci				
Cerium (Ce) 144	Ci				
Cesium (Cs) 134	Ci			5.33E-03	3.37E-03
Cesium (Cs) 136	Ci			2.26E-04	
Cesium (Cs) 137	Ci			4.47E-03	2.77E-03
Chromium (Cr) 51	Ci			7.06E-04	3.08E-03
Cobalt (Co) 57	Ci			4.88E-06	
Cobalt (Co) 58	Ci			8.01E-03	3.33E-02
Cobalt (Co) 60	Ci			1.97E-03	2.89E-03
Iodine (I) 131	Ci			2.47E-03	2.00E-04
Iodine (I) 132	Ci				
Iodine (I) 133	Ci			7.01E-04	1.93E-05
Iodine (I) 135	Ci				
Iron (Fe) 55	Ci			7.88E-03	5.82E-03
Iron (Fe) 59	Ci			3.02E-05	1.12E-04
Lanthanum(La) 140	Ci				6.77E-05
Mercury (Hg) 203	Ci				

TABLE 2B

LIQUID EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1990)

		CONTINUOUS MODE		BATCH MODE	
Nuclides	Unit	1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
Manganese (Mn) 54	Ci			7.90E-05	2.05E-04
Molybdenum(Mo) 99	Ci				
Nickel (Ni) 63	Ci			1.12E-03	3.32E-03
Copper (Cu) 64	Ci				
Niobium (Nb) 95	Ci				4.12E-04
Rubidium (Rb) 88	Ci				
Ruthenium (Ru) 103	Ci				
Ruthenium (Ru) 105	Ci				
Ruthenium (Ru) 106	Ci				
Silver (Ag) 110m	Ci			1.08E-03	2.21E-03
Sodium (Na) 24	Ci				
Strontium (Sr) 85	Ci				2.21E-05
Strontium (Sr) 89	Ci				
Strontium (Sr) 90	Ci				
Technetium(Tc) 99m	Ci			4.57E-05	1.22E-05
Tin (Sn) 113	Ci				
Tungsten (W) 187	Ci				
Yttrium (Y) 91m	Ci				
Yttrium (Y) 92	Ci				
Zinc (Zn) 65	Ci				
Zirconium (Zr) 95	Ci				7.25E-05
TOTAL FOR PERIOD		0.00E-00	0.00E-00	3.73E-02	5.79E-02

TABLE 2B

LIQUID EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1990)

Nuclides	Unit	CONTINUOUS MODE 1st Quarter	CONTINUOUS MODE 2nd Quarter	BATCH MODE 1st Quarter	BATCH MODE 2nd Quarter
Argon (Ar) 41	Ci				1.62E-05
Xenon (Xe) 131m	Ci			2.02E-03	3.26E-04
Xenon (Xe) 133	Ci			9.99E-02	1.28E-01
Xenon (Xe) 133m	Ci			1.01E-03	2.47E-04
Xenon (Xe) 135	Ci			1.37E-03	3.22E-04
Krypton (Kr) 85m	Ci				
Krypton (Kr) 85	Ci				5.04E-03
Krypton (Kr) 88	Ci				
Xenon (Xe) 135m	Ci				
TOTAL DISSOLVED AND ENTRAINED GASES	Ci	0.00E-00	0.00E-00	1.04E-01	1.34E-01

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

D. SOLID WASTE FIRST AND SECOND QUARTERS, 1990

SOLID WASTE SHIPMENTS

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

1. Type of Waste	Unit	6 Month Period Class A	Class B	Class C	Est. Total Error, %
a. Spent resins, filter sludges, etc.	m^3	1.34E+1	0	0	
	Ci	2.73E+1	0	0	25
b. Dry compressible, contam. equipment for burial	m^3	2.97E+0	0	0	
	Ci	3.82E+0	0	0	25
c. Irradiated Components	m^3	0	0	0	
	Ci	0	0	0	N/A
d. Other: Dry compressible, contaminated equip. for volume reduction at offsite facility	m^3	5.36E+2	0	0	
	Ci	1.17E+1	0	0	25

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

NUCLIDE	UNIT	a. Resin CLASS A	b. Dry Waste CLASS A	d. Vol. Red CLASS A
Cr-51	%	1.5	0	0
Mn-54	%	1.4	0	0
Fe-55	%	26	59	59
Co-58	%	14	5	5
Co-60	%	11	28	28
Ni-63	%	5.9	5	5
Cs-134	%	20	0	0
Cs-137	%	18	2	2

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

3. Solid Waste Disposition

Number of Shipments	Mode of Transport	Destination
4	Truck	Barnwell, SC
2	Truck	SEG, Oak Ridge TN: for volume reduction.
1	Truck	Quadrex, Oak Ridge TN: for volume reduction.
13	Truck	Alaron, Wampum, PA: for volume reduction.

4. Containers Shipped

	Class A		Class B		Class C	
Container	Number	Solid. Media	Number	Solid. Media	Number	Solid Media
For Burial:						
Poly HIC	3	None	0	N/A	0	N/A
Drums	14	None	0	N/A	0	N/A
Steel Liner	0	N/A	0	N/A	0	N/A
For Volume Reduction:						
Drums	181	None	0	N/A	0	N/A
Crates	10	None	0	N/A	0	N/A
Sealand Cont.	12	None	0	N/A	0	N/A

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

E. RADIOLOGICAL IMPACT ON MAN

JANUARY - DECEMBER 1990

(Not required to be submitted during this reporting period)

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

F. METEOROLOGICAL DATA

JANUARY - DECEMBER 1990

(Not required to be submitted during this reporting period)

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

G. OFFSITE DOSE CALCULATION MANUAL CHANGES

FIRST AND SECOND QUARTER, 1990

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