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

NewYorkPower Authority

Joseph E. Russell
Resident Manager

February 15, 1991

IP3-91-017
91-IP3-008N

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 July 1, 1990 through December 31, 1990 for Indian Point 3 and would include those releases from Indian Point 2 which resulted from processing liquid waste from Indian Point 3 if this pathway was utilized.

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

JER/MK/jp
Encs.

cc: Document Control Desk (original)
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Resident Inspector's Office
Indian Point 3
US Nuclear Regulatory Commission
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Buchanan, New York 10511

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50-286 INDIAN POINT 3 NYPA

EFFLUENT & WASTE DISPOSAL SEMIANNUAL REPORT FOR JULY 1, 1990 THRU DECEMBER 31, 1990

REC'D W/LTR DTD 02/15/91....9103120174

Effluent and Waste Disposal

Semi-Annual Report

July 1, 1990 - December 31, 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:

3rd Quarter	E_β = 1.46E-01 or Mev/dis	$E\gamma$ = 5.54E-02 Mev/dis
4th Quarter	E_β = 2.16E-01 or Mev/dis	$E\gamma$ = 1.19E-01 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 3rd Quarter	1990 4th Quarter
Number of Batch Releases	68	50
Total Time Period Batch Releases (Min.)	10040	7919
Maximum " " " " " "	300	340
Average " " " " " "	147.6	158.5
Minimum " " " " " "	110	60
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)
1988	Fourth	16270
1989	First	12800
1989	Second	35733
1989	Third	10613

b) Gaseous

Number of Batch Releases	16	3
Total Time Period Batch Releases (Min.)	3786	240
Maximum " " " " "	618	124
Average " " " " "	236.6	80
Minimum " " " " "	30	40

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 180 days. This outage was due to damage to the detector system and long lead time for procurement of spare parts. Monitor replacement is being pursued and will eliminate repetitive failures. Requisite sampling was inadvertently missed for a short period of time and reported under LER No. 90-009.

Radioactive Machine Shop Ventilation Flow.

A recent internal audit of the RETS effluent instrumentation program and the Offsite Dose Calculation Manual (ODCM) identified a discrepancy concerning Radioactive Machine Shop Ventilation Flow. Section 3.1.13 of the ODCM allows use of the rated fan flow during periods of inoperability of the installed flow monitor. Contrary to this direction, rated fan flow was used to calculate the effect of radioactive releases from this pathway when the monitor was considered operable. This audit also identified a failure to perform periodic surveillance checks of the monitor. These issues have been corrected and changes in the ODCM to clearly specify the requirements will be submitted during the next reporting period.

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

B. GASEOUS EFFLUENTS

THIRD AND FOURTH QUARTERS 1990

TABLE 1A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	UNIT	QUARTER 3rd	QUARTER 4th	EST.TOTAL Error %
A. Fission & Activation Gases				
1. Total Release	Curies	3.50E+02	1.53E 00	2.50E+01
2. Average release rate for period	uCi/sec	4.40E+01	1.93E-01	
3. Percent of technical spec. limit	%	3.77E+00	2.45E-02	
B. Iodines				
1. Total Iodine - 131	Ci	7.61E-05	9.07E-06	2.50E+01
2. Average release rate for period	uCi/sec	9.58E-06	1.14E-06	
C. Particulates				
1. Particulates with half-lives >8 days	Ci	2.91E-06	2.04E-05	2.50E+01
2. Average release rate for period	uCi/sec	3.66E-07	2.56E-06	
3. Gross alpha radioactivity	Ci	<3.73E-07	<3.58E-07	
D. Tritium				
1. Total release	Ci	3.29E-01	4.58E-01	2.50E+01
2. Average release rate for period	uCi/sec	4.14E-02	5.76E-02	
E. Percent of Tech Spec Limit Iodines, Particulate, & Tritium	%	1.67E-02	4.80E-03	2.50E+01

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

Nuclides Released	Unit	CONTINUOUS MODE 3rd Quarter	CONTINUOUS MODE 4th Quarter	BATCH MODE 3rd Quarter	BATCH MODE 4th Quarter
1) Fission Gases					
Krypton (Kr) 85m	Ci	2.51E-01	6.96E-04	1.33E-03	
Krypton (Kr) 85	Ci	1.92E-00	7.48E-02	1.98E-00	8.07E-02
Krypton (Kr) 87	Ci				
Krypton (Kr) 88	Ci	9.43E-03			
Xenon (Xe) 131m	Ci	1.26E-00		1.45E-00	1.42E-03
Xenon (Xe) 133m	Ci	6.81E-01		8.35E-01	
Xenon (Xe) 133	Ci	2.36E+02	7.92E-01	8.86E+01	
Xenon (Xe) 135m	Ci				
Xenon (Xe) 135	Ci	1.66E+01	5.85E-01	4.64E-01	
Xenon (Xe) 138	Ci				
Argon (Ar) 41	Ci	4.33E-02	7.95E-04		
TOTAL FOR PERIOD	Ci	2.56E+02	1.45E+00	9.33E+01	8.21E-02
2) Iodines					
Iodine (I) 131	Ci	7.61E-05	9.07E-06		
Iodine (I) 133	Ci				
Iodine (I) 135	Ci				
TOTAL FOR PERIOD	Ci	7.61E-05	9.07E-06	0.00E-00	0.00E-00

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

Nuclides Released	Unit	CONTINUOUS MODE 3rd Quarter	CONTINUOUS MODE 4th Quarter	BATCH MODE 3rd Quarter	BATCH MODE 4th 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	5.89E-07	5.32E-06		
Cesium (Cs) 137	Ci	9.40E-07	5.12E-06		
Cobalt (Co) 57	Ci				
Cobalt (Co) 58	Ci	1.38E-06	9.92E-06		
Cobalt (Co) 60	Ci				
Chromium (Cr) 51	Ci				
Niobium (Nb) 95	Ci				
Strontium (Sr) 89	Ci				
Strontium (Sr) 90	Ci				
Tin (Sn) 113	Ci				
TOTAL	Ci	2.91E-06	2.04E-05		

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

C. LIQUID EFFLUENTS

THIRD AND FOURTH QUARTERS, 1990

TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	UNITS	QUARTER 3rd	QUARTER 4th	EST. TOTAL ERROR %
A. Fission and activation products				
1. Total release (not including tritium, gases, alpha)	Ci	7.39E-02	1.40E-01	2.50E+01
2. Average diluted concentration during period	uCi/ml	1.50E-10	8.08E-10	
B. Tritium				
1. Total release	Ci	1.03E+02	1.83E+01	2.50E+01
2. Average diluted concentration during period	uCi/ml	2.10E-07	1.06E-07	
C. Dissolved and entrained gases				
1. Total release	Ci	4.11E-00	1.38E-02	2.50E+01
2. Average diluted concentration during period	uCi/ml	8.34E-09	7.94E-11	
D. Gross alpha radioactivity				
1. Total release	Ci	<9.37E-05	<6.73E-05	2.50E+01
E. Volume of waste released (prior to dilution)	liters	2.34E+06	1.66E+06	1.00E+01
F. Volume of dilution water used during period	liters	4.93E+11	1.73E+11	1.00E+01
G. Percent of liquid effluent limit	%	5.69E-01	6.54E-01	2.50E+01

TABLE 2B

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

Nuclides Released	Unit	CONTINUOUS MODE 3rd Quarter	CONTINUOUS MODE 4th Quarter	BATCH MODE 3rd Quarter	BATCH MODE 4th Quarter
Antimony (Sb) 122	Ci				
Antimony (Sb) 124	Ci			3.39E-03	1.09E-02
Antimony (Sb) 125	Ci			3.14E-03	9.90E-03
Beryllium (Be) 7	Ci				
Barium (Ba) 140	Ci				
Cadmium (Cd) 109	Ci				
Cerium (Ce) 139	Ci				
Cerium (Ce) 141	Ci				
Cerium (Ce) 144	Ci				
Cesium (Cs) 134	Ci			1.49E-02	3.53E-03
Cesium (Cs) 136	Ci				
Cesium (Cs) 137	Ci			1.26E-02	2.92E-03
Cesium (Cs) 138	Ci			3.73E-05	
Chromium (Cr) 51	Ci			4.64E-05	1.41E-02
Cobalt (Co) 57	Ci				2.75E-05
Cobalt (Co) 58	Ci			1.77E-02	3.59E-02
Cobalt (Co) 60	Ci			3.73E-03	7.06E-03
Iodine (I) 131	Ci			4.93E-04	1.14E-04
Iodine (I) 132	Ci				
Iodine (I) 133	Ci			4.29E-05	
Iodine (I) 135	Ci				
Iron (Fe) 55	Ci			5.59E-03	4.40E-02
Iron (Fe) 59	Ci				8.78E-04
Lanthanum (La) 140	Ci			1.72E-04	
Mercury (Hg) 203	Ci				

TABLE 2B

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

		CONTINUOUS MODE		BATCH MODE	
Nuclides	Unit	3rd Quarter	4th Quarter	3rd Quarter	4th Quarter
Manganese (Mn) 54	Ci			1.15E-04	1.06E-03
Molybdenum(Mo) 99	Ci				
Nickel (Ni) 63	Ci			9.62E-03	3.73E-03
Copper (Cu) 64	Ci				
Niobium (Nb) 95	Ci			2.34E-05	1.76E-03
Rubidium (Rb) 88	Ci			7.61E-04	
Ruthenium (Ru) 103	Ci				2.59E-05
Ruthenium (Ru) 105	Ci				
Ruthenium (Ru) 106	Ci				
Silver (Ag) 110m	Ci			1.25E-03	2.82E-03
Sodium (Na) 24	Ci				1.86E-04
Strontium (Sr) 85	Ci			2.74E-04	
Strontium (Sr) 89	Ci				2.56E-05
Strontium (Sr) 90	Ci				
Technetium(Tc) 99m	Ci			7.65E-05	
Tin (Sn) 113	Ci				4.17E-04
Tungsten (W) 187	Ci				
Yttrium (Y) 91m	Ci				
Yttrium (Y) 92	Ci				
Zinc (Zn) 65	Ci				
Zirconium (Zr) 95	Ci				6.75E-04
TOTAL FOR PERIOD		0.00E-00	0.00E-00	7.40E-02	1.40E-01

TABLE 2B

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

Nuclides		Unit	CONTINUOUS MODE 3rd Quarter	CONTINUOUS MODE 4th Quarter	BATCH MODE 3rd Quarter	BATCH MODE 4th Quarter
Argon	(Ar) 41	Ci				
Xenon	(Xe) 131m	Ci			8.85E-02	6.24E-04
Xenon	(Xe) 133	Ci			3.92E-00	1.32E-02
Xenon	(Xe) 133m	Ci			3.00E-02	
Xenon	(Xe) 135	Ci			7.77E-03	
Krypton	(Kr) 85m	Ci			4.94E-04	
Krypton	(Kr) 85	Ci			6.25E-02	
Krypton	(Kr) 88	Ci			5.70E-05	
Xenon	(Xe) 135m	Ci				
TOTAL DISSOLVED AND ENTRAINED GASES		Ci	0.00E-00	0.00E-00	4.11E-00	1.38E-02

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

D. SOLID WASTE THIRD AND FOURTH QUARTERS, 1990

TABLE 3
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
July 1 - December 31, 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	8.32E+0	0	
	Ci	3.51E+1	6.39E+1	0	25
b. Dry compressible, contam. equipment for burial	m^3	3.07E+1	0	0	
	Ci	5.99E+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	6.14E+1	0	0	
	Ci	1.92E+0	0	0	25

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

NUCLIDE	UNIT	a. Resin CLASS A	a. Resin CLASS B	b. Dry Waste CLASS A	d. Vol. Red CLASS A
Cr-51	%	1.5	0.6	0	0
Mn-54	%	1.4	0.6	0	0
Fe-55	%	26	16	59	59
Co-58	%	14	4	5	5
Co-60	%	11	28	28	28
Ni-63	%	5.9	11	5	5
Cs-134	%	20	21.8	0	0
Cs-137	%	18	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
7	Truck	Barnwell, SC
3	Truck	SEG, Oak Ridge TN: for volume reduction.

4. Containers Shipped

Container	Class A Number	Class A Solid. Media	Class B Number	Class B Solid. Media	Class C Number	Class C Solid Media
For Burial:						
Poly HIC	3	None	2	None	0	N/A
Drums	14	None	0	N/A	0	N/A
Steel Liner	0	N/A	0	None	0	N/A
Crates	10	None	0	None	0	N/A
For Volume Reduction:						
Drums	198	None	0	N/A	0	N/A
Crates	7	None	0	N/A	0	N/A
Sealand Cont.	0	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

RADIOLOGICAL IMPACT ON MAN

The radiological impact on man is determined by conservatively calculating doses to a hypothetically maximum individual offsite based on plant effluents. These calculations are divided into 3 categories:

- Noble Gases
- Particulates and Iodine
- Liquid Releases (fish and invertebrate consumption)

An annual average dispersion factor is used in the calculations, the details of which are presented in the Offsite Dose Calculation Manual.

The computer code used to perform gaseous dose calculations incorporates the models and parameters presented in the Indian Point 3 ODCM which utilizes the assumptions in Regulatory Guide 1.109 and NUREG 0133.

Dose calculations from liquid pathways to individuals for the fish and invertebrate consumption pathways are computed using the methodology and parameters in the Indian Point 3 ODCM which incorporates the calculational models that are present in Regulatory Guide 1.109 and NUREG 0133 where site specific data does not exist.

Carbon 14 release concentration and resulting dose has been estimated using data generated at Indian Point 3 from August 1980 to June 1982 after a study conducted by the New York State Department of Health. These estimates are consistent with NUREG 0017, Rev. 1. The maximum dose from Carbon 14 releases has been calculated using the maximum dependable gross electrical capacity of Indian Point 3 which is 1000 MW maintained for the entire year for Carbon 14. The resultant dose to the maximum exposed individual (child) from gaseous releases is 0.68 mRem to the critical organ (bone) and 0.14 mRem to the total body. These values are based upon site specific assumptions. The resultant dose to the maximum exposed individual from liquid releases from Carbon 14 is 0.012 mRem to the critical organ and 0.0025 mRem to the total body.

Indian Point 3
Radiological Impact on Man
January - December 1990
(Reference: Indian Point 3 RETS, Section 5.3.3)

Maximum Exposed Individual Doses in mrem

	Total Body	Skin	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI
A. Gaseous Pathway								
A.1 Noble Gases *	7.19E-02	3.40E-01						
A.2 Radioiodines,** Particulates, and Tritium	7.19E-02		1.54E-04	7.20E-02	7.38E-02	7.19E-02	7.19E-02	7.19E-02
B. Liquid Pathway* **								
B.1 All Releases	3.18E-02		4.86E-02	5.26E-02	5.27E-03	1.17E-02	1.40E-02	4.26E-02
TOTALS	1.76E-01	3.40E-01	4.88E-02	1.25E-01	7.91E-02	8.36E-02	8.59E-02	1.14E-01

* Site Boundary, 350 meters, SW sector
** Infant, 8.1 km, SSW sector
*** Adult, 1.4 km, SW sector

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

F. METEOROLOGICAL DATA

JANUARY - DECEMBER 1990

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

G. OFFSITE DOSE CALCULATION MANUAL CHANGES

THIRD AND FOURTH QUARTER, 1990

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

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT JAN-MAR 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS A

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	0.	3.	2.	0.	0.	0.	5.
NNE	0.	0.	0.	0.	0.	0.	0.
NE	0.	0.	0.	0.	0.	0.	0.
ENE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	0.	0.	0.	0.	0.	0.	0.
SSE	0.	7.	7.	0.	0.	0.	14.
S	0.	0.	4.	0.	0.	0.	4.
SSW	0.	0.	0.	0.	0.	0.	0.
SW	0.	1.	0.	0.	0.	0.	1.
WSW	0.	1.	0.	0.	0.	0.	1.
W	0.	5.	2.	0.	0.	0.	7.
WNW	0.	1.	1.	0.	0.	0.	2.
NW	0.	3.	14.	0.	0.	0.	17.
NNW	0.	1.	11.	0.	0.	0.	12.
TOTAL	0.	22.	41.	0.	0.	0.	63.

CALM 0.

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT JAN-MAR 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS B

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	0.	9.	2.	0.	0.	0.	11.
NNE	0.	1.	0.	0.	0.	0.	1.
NE	0.	0.	0.	0.	0.	0.	0.
ENE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	0.	0.	0.	0.	0.	0.	0.
SSE	0.	7.	3.	0.	0.	0.	10.
S	0.	3.	7.	0.	0.	0.	10.
SSW	0.	0.	1.	0.	0.	0.	1.
SW	0.	1.	0.	0.	0.	0.	1.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	2.	0.	0.	0.	0.	2.
WNW	0.	4.	4.	0.	0.	0.	8.
NW	0.	4.	8.	0.	0.	0.	12.
NNW	0.	0.	1.	0.	0.	0.	1.
TOTAL	0.	31.	26.	0.	0.	0.	57.

CALM 0.

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT JAN-MAR 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS C

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	0.	3.	0.	0.	0.	0.	3.
NNE	0.	3.	0.	0.	0.	0.	3.
NE	0.	0.	0.	0.	0.	0.	0.
ENE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	0.	0.	0.	0.	0.	0.	0.
SSE	0.	4.	1.	0.	0.	0.	5.
S	0.	6.	6.	0.	0.	0.	12.
SSW	0.	2.	0.	0.	0.	0.	2.
SW	0.	1.	0.	0.	0.	0.	1.
WSW	0.	1.	0.	0.	0.	0.	1.
W	0.	1.	1.	0.	0.	0.	2.
WNW	0.	5.	2.	0.	0.	0.	7.
NW	0.	7.	10.	2.	0.	0.	19.
NNW	0.	2.	3.	0.	0.	0.	5.
TOTAL	0.	35.	23.	2.	0.	0.	60.

CALM 0.

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT JAN-MAR 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS D

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	6.	67.	28.	6.	0.	0.	107.
NNE	20.	69.	51.	1.	0.	0.	141.
NE	17.	21.	0.	0.	0.	0.	38.
ENE	21.	7.	0.	0.	0.	0.	28.
E	8.	4.	0.	0.	0.	0.	12.
ESE	8.	1.	0.	0.	0.	0.	9.
SE	10.	4.	0.	0.	0.	0.	14.
SSE	9.	33.	11.	0.	0.	0.	53.
S	5.	54.	22.	2.	0.	0.	83.
SSW	2.	19.	3.	1.	0.	0.	25.
SW	1.	7.	1.	0.	0.	0.	9.
WSW	2.	12.	2.	0.	0.	0.	16.
W	2.	15.	11.	0.	0.	0.	28.
WNW	4.	35.	25.	0.	0.	0.	64.
NW	5.	52.	87.	9.	0.	0.	153.
NNW	4.	61.	24.	1.	0.	0.	90.
TOTAL	124.	461.	265.	20.	0.	0.	870.

CALM 2.

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT JAN-MAR 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS E

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	12.	20.	4.	0.	0.	0.	36.
NNE	62.	47.	1.	0.	0.	0.	110.
NE	93.	27.	0.	0.	0.	0.	120.
ENE	54.	5.	0.	0.	0.	0.	59.
E	30.	1.	0.	0.	0.	0.	31.
ESE	19.	3.	0.	0.	0.	0.	22.
SE	29.	5.	0.	0.	0.	0.	34.
SSE	34.	51.	5.	0.	0.	0.	90.
S	12.	78.	24.	0.	0.	0.	114.
SSW	9.	21.	5.	1.	0.	0.	36.
SW	5.	10.	0.	0.	0.	0.	15.
WSW	4.	7.	2.	0.	0.	0.	13.
W	2.	7.	1.	0.	0.	0.	10.
WNW	6.	22.	1.	0.	0.	0.	29.
NW	10.	13.	5.	0.	0.	0.	28.
NNW	2.	8.	4.	0.	0.	0.	14.
TOTAL	383.	325.	52.	1.	0.	0.	761.

CALM 10.

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT JAN-MAR 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS F

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	3.	1.	0.	0.	0.	0.	4.
NNE	43.	3.	0.	0.	0.	0.	46.
NE	74.	27.	0.	0.	0.	0.	101.
ENE	23.	3.	0.	0.	0.	0.	26.
E	15.	0.	0.	0.	0.	0.	15.
ESE	10.	1.	0.	0.	0.	0.	11.
SE	8.	0.	0.	0.	0.	0.	8.
SSE	13.	7.	0.	0.	0.	0.	20.
S	3.	14.	1.	0.	0.	0.	18.
SSW	2.	4.	0.	0.	0.	0.	6.
SW	4.	1.	0.	0.	0.	0.	5.
WSW	5.	1.	0.	0.	0.	0.	6.
W	3.	0.	0.	0.	0.	0.	3.
WNW	1.	0.	0.	0.	0.	0.	1.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	1.	0.	0.	0.	0.	0.	1.
TOTAL	208.	62.	1.	0.	0.	0.	271.

CALM 1.

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT JAN-MAR 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS G

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	1.	0.	0.	0.	0.	0.	1.
NNE	20.	2.	0.	0.	0.	0.	22.
NE	15.	15.	1.	0.	0.	0.	31.
ENE	3.	0.	0.	0.	0.	0.	3.
E	1.	0.	0.	0.	0.	0.	1.
ESE	1.	0.	0.	0.	0.	0.	1.
SE	1.	1.	0.	0.	0.	0.	2.
SSE	1.	1.	0.	0.	0.	0.	2.
S	2.	0.	0.	0.	0.	0.	2.
SSW	0.	0.	0.	0.	0.	0.	0.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	0.	0.	0.	0.	0.	0.
WNW	0.	0.	0.	0.	0.	0.	0.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	0.	0.	0.	0.	0.	0.	0.
TOTAL	45.	19.	1.	0.	0.	0.	65.

CALM 0.

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT APR-JUNE 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS A

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	0.	21.	11.	0.	0.	0.	32.
NNE	0.	13.	6.	0.	0.	0.	19.
NE	0.	0.	0.	0.	0.	0.	0.
ENE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	1.	0.	0.	0.	0.	1.
SE	0.	5.	0.	0.	0.	0.	5.
SSE	0.	27.	18.	0.	0.	0.	45.
S	0.	11.	21.	1.	0.	0.	33.
SSW	0.	2.	0.	0.	0.	0.	2.
SW	1.	1.	0.	0.	0.	0.	2.
WSW	0.	1.	0.	0.	0.	0.	1.
W	1.	7.	1.	0.	0.	0.	9.
WNW	1.	16.	10.	0.	0.	0.	27.
NW	1.	26.	15.	0.	0.	0.	42.
NNW	0.	13.	1.	0.	0.	0.	14.
TOTAL	4.	144.	83.	1.	0.	0.	232.

CALM 0.

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT APR-JUNE 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS B

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	2.	7.	4.	0.	0.	0.	13.
NNE	0.	10.	8.	0.	0.	0.	18.
NE	0.	2.	0.	0.	0.	0.	2.
ENE	0.	1.	0.	0.	0.	0.	1.
E	1.	0.	0.	0.	0.	0.	1.
ESE	0.	1.	0.	0.	0.	0.	1.
SE	0.	0.	0.	0.	0.	0.	0.
SSE	3.	6.	8.	0.	0.	0.	17.
S	1.	10.	5.	0.	0.	0.	16.
SSW	0.	2.	2.	0.	0.	0.	4.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	2.	1.	0.	0.	0.	0.	3.
W	0.	2.	1.	0.	0.	0.	3.
WNW	0.	4.	3.	0.	0.	0.	7.
NW	0.	8.	2.	0.	0.	0.	10.
NNW	0.	5.	3.	0.	0.	0.	8.
TOTAL	9.	59.	36.	0.	0.	0.	104.

CALM 0.

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT APR-JUNE 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS C

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	1.	7.	1.	1.	0.	0.	10.
NNE	0.	16.	3.	0.	0.	0.	19.
NE	1.	6.	0.	0.	0.	0.	7.
ENE	1.	3.	0.	0.	0.	0.	4.
E	0.	0.	0.	0.	0.	0.	0.
ESE	1.	0.	0.	0.	0.	0.	1.
SE	0.	2.	0.	0.	0.	0.	2.
SSE	0.	8.	3.	0.	0.	0.	11.
S	0.	14.	9.	0.	0.	0.	23.
SSW	2.	5.	0.	0.	0.	0.	7.
SW	0.	2.	0.	0.	0.	0.	2.
WSW	1.	1.	3.	0.	0.	0.	5.
W	0.	2.	1.	0.	0.	0.	3.
WNW	2.	6.	3.	0.	0.	0.	11.
NW	0.	7.	2.	0.	0.	0.	9.
NNW	0.	6.	1.	0.	0.	0.	7.
TOTAL	9.	85.	26.	1.	0.	0.	121.

CALM 0.

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT APR-JUNE 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS D

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	9.	28.	5.	0.	0.	0.	42.
NNE	28.	95.	34.	3.	0.	0.	160.
NE	48.	52.	2.	0.	0.	0.	102.
ENE	34.	11.	0.	0.	0.	0.	45.
E	26.	5.	0.	0.	0.	0.	31.
ESE	14.	1.	0.	0.	0.	0.	15.
SE	23.	9.	0.	0.	0.	0.	32.
SSE	14.	100.	24.	2.	0.	0.	140.
S	10.	61.	19.	0.	0.	0.	90.
SSW	3.	24.	8.	0.	0.	0.	35.
SW	3.	12.	0.	0.	0.	0.	15.
WSW	2.	9.	5.	0.	0.	0.	16.
W	5.	8.	10.	0.	0.	0.	23.
WNW	2.	21.	5.	0.	0.	0.	28.
NW	7.	27.	19.	1.	0.	0.	54.
NNW	4.	27.	6.	0.	0.	0.	37.
TOTAL	232.	490.	137.	6.	0.	0.	865.

CALM 2.

*******NRC FORMAT FOR NUREG 1021******

INDIAN POINT APR-JUNE 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS E

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	6.	15.	7.	0.	0.	0.	28.
NNE	30.	33.	11.	0.	0.	0.	74.
NE	101.	31.	0.	0.	0.	0.	132.
ENE	47.	5.	0.	0.	0.	0.	52.
E	34.	0.	0.	0.	0.	0.	34.
ESE	24.	6.	0.	0.	0.	0.	30.
SE	30.	8.	0.	0.	0.	0.	38.
SSE	16.	61.	2.	0.	0.	0.	79.
S	4.	65.	18.	3.	0.	0.	90.
SSW	2.	24.	7.	0.	0.	0.	33.
SW	1.	6.	0.	0.	0.	0.	7.
WSW	4.	6.	1.	0.	0.	0.	11.
W	2.	6.	2.	0.	0.	0.	10.
WNW	1.	5.	0.	0.	0.	0.	6.
NW	2.	7.	1.	0.	0.	0.	10.
NNW	2.	7.	1.	0.	0.	0.	10.
TOTAL	306.	285.	50.	3.	0.	0.	644.

CALM 2.

*******NRC FORMAT FOR NUREG [illegible]1******

INDIAN POINT APR-JUNE 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS F

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	0.	2.	0.	0.	0.	0.	2.
NNE	18.	8.	0.	0.	0.	0.	26.
NE	53.	23.	0.	0.	0.	0.	76.
ENE	14.	2.	0.	0.	0.	0.	16.
E	12.	0.	0.	0.	0.	0.	12.
ESE	5.	0.	0.	0.	0.	0.	5.
SE	5.	2.	0.	0.	0.	0.	7.
SSE	2.	4.	0.	0.	0.	0.	6.
S	3.	8.	0.	0.	0.	0.	11.
SSW	1.	0.	0.	0.	0.	0.	1.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	0.	1.	0.	0.	0.	0.	1.
W	0.	0.	0.	0.	0.	0.	0.
WNW	0.	0.	0.	0.	0.	0.	0.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	0.	1.	0.	0.	0.	0.	1.
TOTAL	113.	51.	0.	0.	0.	0.	164.

CALM 0.

*******NRC FORMAT FOR NURE[illegible]21******

INDIAN POINT APR-JUNE 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS G

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	1.	0.	0.	0.	0.	0.	1.
NNE	1.	3.	0.	0.	0.	0.	4.
NE	14.	6.	0.	0.	0.	0.	20.
ENE	4.	0.	0.	0.	0.	0.	4.
E	2.	0.	0.	0.	0.	0.	2.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	0.	0.	0.	0.	0.	0.	0.
SSE	1.	0.	0.	0.	0.	0.	1.
S	0.	0.	0.	0.	0.	0.	0.
SSW	0.	0.	0.	0.	0.	0.	0.
SW	1.	0.	0.	0.	0.	0.	1.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	0.	0.	0.	0.	0.	0.
WNW	0.	0.	0.	0.	0.	0.	0.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	0.	0.	0.	0.	0.	0.	0.
TOTAL	24.	9.	0.	0.	0.	0.	33.

CALM 0.

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT JULY-SEPT 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS A

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	1.	33.	5.	0.	0.	0.	39.
NNE	2.	22.	7.	0.	0.	0.	31.
NE	4.	3.	1.	0.	0.	0.	8.
ENE	2.	2.	0.	0.	0.	0.	4.
E	0.	1.	0.	0.	0.	0.	1.
ESE	4.	0.	0.	0.	0.	0.	4.
SE	1.	4.	0.	0.	0.	0.	5.
SSE	5.	26.	2.	0.	0.	0.	33.
S	4.	15.	1.	0.	0.	0.	20.
SSW	1.	7.	6.	0.	0.	0.	14.
SW	1.	2.	0.	0.	0.	0.	3.
WSW	1.	7.	1.	0.	0.	0.	9.
W	1.	16.	2.	0.	0.	0.	19.
WNW	8.	15.	0.	0.	0.	0.	23.
NW	8.	11.	0.	0.	0.	0.	19.
NNW	2.	7.	0.	0.	0.	0.	9.
TOTAL	45.	171.	25.	0.	0.	0.	241.

CALM 2.

INDIAN POINT JULY-SEPT 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS B

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	2.	22.	1.	0.	0.	0.	25.
NNE	3.	24.	4.	0.	0.	0.	31.
NE	2.	6.	1.	0.	0.	0.	9.
ENE	3.	0.	0.	0.	0.	0.	3.
E	4.	0.	0.	0.	0.	0.	4.
ESE	1.	1.	0.	0.	0.	0.	2.
SE	6.	0.	0.	0.	0.	0.	6.
SSE	2.	10.	1.	0.	0.	0.	13.
S	7.	14.	3.	0.	0.	0.	24.
SSW	0.	8.	7.	0.	0.	0.	15.
SW	1.	2.	0.	0.	0.	0.	3.
WSW	1.	1.	0.	0.	0.	0.	2.
W	0.	2.	0.	0.	0.	0.	2.
WNW	1.	2.	0.	0.	0.	0.	3.
NW	1.	2.	0.	0.	0.	0.	3.
NNW	0.	2.	0.	0.	0.	0.	2.
TOTAL	34.	96.	17.	0.	0.	0.	147.

CALM 1.

INDIAN POINT JULY-SEPT 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS C

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	5.	10.	0.	0.	0.	0.	15.
NNE	7.	22.	7.	0.	0.	0.	36.
NE	8.	7.	0.	0.	0.	0.	15.
ENE	8.	5.	0.	0.	0.	0.	13.
E	8.	0.	0.	0.	0.	0.	8.
ESE	5.	0.	0.	0.	0.	0.	5.
SE	5.	2.	0.	0.	0.	0.	7.
SSE	3.	9.	2.	0.	0.	0.	14.
S	0.	19.	4.	0.	0.	0.	23.
SSW	1.	5.	0.	0.	0.	0.	6.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	2.	0.	0.	0.	0.	0.	2.
W	1.	4.	0.	0.	0.	0.	5.
WNW	2.	1.	0.	0.	0.	0.	3.
NW	2.	3.	0.	0.	0.	0.	5.
NNW	2.	3.	0.	0.	0.	0.	5.
TOTAL	59.	90.	13.	0.	0.	0.	162.

CALM 0.

INDIAN POINT JULY-SEPT 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS D

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	8.	24.	1.	0.	0.	0.	33.
NNE	27.	169.	53.	0.	0.	0.	249.
NE	53.	93.	3.	0.	0.	0.	149.
ENE	46.	1.	0.	0.	0.	0.	47.
E	18.	0.	0.	0.	0.	0.	18.
ESE	19.	2.	0.	0.	0.	0.	21.
SE	14.	7.	0.	0.	0.	0.	21.
SSE	10.	28.	1.	0.	0.	0.	39.
S	6.	42.	22.	0.	0.	0.	70.
SSW	2.	12.	5.	0.	0.	0.	19.
SW	2.	1.	0.	0.	0.	0.	3.
WSW	0.	0.	0.	0.	0.	0.	0.
W	2.	4.	0.	0.	0.	0.	6.
WNW	3.	4.	0.	0.	0.	0.	7.
NW	2.	2.	0.	0.	0.	0.	4.
NNW	1.	6.	0.	0.	0.	0.	7.
TOTAL	213.	395.	85.	0.	0.	0.	693.

CALM 4.

*******NRC FORMAT FOR NUREG 1.21******

INDIAN POINT JULY-SEPT 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS E

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	9.	10.	5.	0.	0.	0.	24.
NNE	48.	59.	0.	0.	0.	0.	107.
NE	191.	123.	0.	0.	0.	0.	314.
ENE	75.	4.	0.	0.	0.	0.	79.
E	41.	1.	0.	0.	0.	0.	42.
ESE	17.	2.	0.	0.	0.	0.	19.
SE	17.	5.	0.	0.	0.	0.	22.
SSE	14.	27.	0.	0.	0.	0.	41.
S	9.	34.	8.	0.	0.	0.	51.
SSW	1.	4.	0.	0.	0.	0.	5.
SW	1.	1.	0.	0.	0.	0.	2.
WSW	0.	1.	0.	0.	0.	0.	1.
W	0.	1.	0.	0.	0.	0.	1.
WNW	3.	1.	0.	0.	0.	0.	4.
NW	4.	4.	0.	0.	0.	0.	8.
NNW	5.	3.	1.	0.	0.	0.	9.
TOTAL	435.	280.	14.	0.	0.	0.	729.

CALM 3.

INDIAN POINT JULY-SEPT 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS F

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	0.	0.	0.	0.	0.	0.	0.
NNE	17.	6.	0.	0.	0.	0.	23.
NE	56.	26.	0.	0.	0.	0.	82.
ENE	21.	3.	0.	0.	0.	0.	24.
E	6.	0.	0.	0.	0.	0.	6.
ESE	5.	0.	0.	0.	0.	0.	5.
SE	3.	0.	0.	0.	0.	0.	3.
SSE	1.	2.	0.	0.	0.	0.	3.
S	0.	2.	0.	0.	0.	0.	2.
SSW	0.	0.	0.	0.	0.	0.	0.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	0.	0.	0.	0.	0.	0.
WNW	1.	0.	0.	0.	0.	0.	1.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	1.	0.	0.	0.	0.	0.	1.
TOTAL	111.	39.	0.	0.	0.	0.	150.

CALM 0.

INDIAN POINT JULY-SEPT 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS G

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	0.	0.	0.	0.	0.	0.	0.
NNE	0.	0.	0.	0.	0.	0.	0.
NE	0.	0.	0.	0.	0.	0.	0.
ENE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	0.	0.	0.	0.	0.	0.	0.
SSE	0.	0.	0.	0.	0.	0.	0.
S	0.	0.	0.	0.	0.	0.	0.
SSW	0.	0.	0.	0.	0.	0.	0.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	0.	0.	0.	0.	0.	0.
WNW	0.	0.	0.	0.	0.	0.	0.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	0.	0.	0.	0.	0.

CALM 0.

INDIAN POINT OCT-DEC 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS A

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	0.	14.	1.	0.	0.	0.	15.
NNE	0.	2.	0.	0.	0.	0.	2.
NE	0.	0.	0.	0.	0.	0.	0.
ENE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	0.	0.	0.	0.	0.	0.	0.
SSE	0.	10.	5.	0.	0.	0.	15.
S	0.	2.	1.	0.	0.	0.	3.
SSW	0.	2.	0.	0.	0.	0.	2.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	1.	0.	0.	0.	0.	1.
WNW	0.	1.	3.	0.	0.	0.	4.
NW	0.	9.	4.	0.	0.	0.	13.
NNW	0.	5.	5.	0.	0.	0.	10.
TOTAL	0.	46.	19.	0.	0.	0.	65.

CALM 0.

INDIAN POINT OCT-DEC 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS B

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	2.	11.	2.	4.	0.	0.	19.
NNE	0.	1.	1.	0.	0.	0.	2.
NE	0.	0.	0.	0.	0.	0.	0.
ENE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	2.	0.	0.	0.	0.	0.	2.
SSE	0.	10.	0.	0.	0.	0.	10.
S	0.	7.	2.	0.	0.	0.	9.
SSW	0.	0.	2.	0.	0.	0.	2.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	0.	2.	0.	0.	0.	0.	2.
W	0.	1.	0.	0.	0.	0.	1.
WNW	2.	1.	0.	0.	0.	0.	3.
NW	0.	5.	6.	0.	0.	0.	11.
NNW	1.	11.	0.	0.	0.	0.	12.
TOTAL	7.	49.	13.	4.	0.	0.	73.

CALM 0.

INDIAN POINT OCT-DEC 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS C

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	1.	13.	4.	2.	0.	0.	20.
NNE	0.	7.	1.	0.	0.	0.	8.
NE	0.	0.	0.	0.	0.	0.	0.
ENE	1.	0.	0.	0.	0.	0.	1.
E	1.	0.	0.	0.	0.	0.	1.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	0.	1.	0.	0.	0.	0.	1.
SSE	1.	7.	1.	0.	0.	0.	9.
S	0.	11.	6.	0.	0.	0.	17.
SSW	0.	3.	0.	0.	0.	0.	3.
SW	0.	1.	0.	0.	0.	0.	1.
WSW	0.	1.	0.	0.	0.	0.	1.
W	0.	1.	1.	0.	0.	0.	2.
WNW	0.	1.	4.	0.	0.	0.	5.
NW	0.	8.	8.	2.	0.	0.	18.
NNW	0.	6.	1.	0.	0.	0.	7.
TOTAL	4.	60.	26.	4.	0.	0.	94.

CALM 0.

INDIAN POINT OCT-DEC 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS D

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	6.	64.	28.	28.	0.	0.	126.
NNE	14.	65.	25.	10.	0.	0.	114.
NE	34.	16.	0.	0.	0.	0.	50.
ENE	22.	3.	0.	0.	0.	0.	25.
E	16.	1.	0.	0.	0.	0.	17.
ESE	11.	6.	0.	0.	0.	0.	17.
SE	11.	8.	0.	0.	0.	0.	19.
SSE	5.	29.	2.	1.	0.	0.	37.
S	1.	31.	14.	4.	1.	0.	51.
SSW	2.	10.	0.	0.	0.	0.	12.
SW	2.	3.	2.	0.	0.	0.	7.
WSW	3.	4.	3.	0.	0.	0.	10.
W	1.	16.	11.	1.	0.	0.	29.
WNW	0.	23.	27.	4.	0.	0.	54.
NW	5.	54.	72.	4.	0.	0.	135.
NNW	4.	75.	28.	0.	0.	0.	107.
TOTAL	137.	408.	212.	52.	1.	0.	810.

CALM 0.

INDIAN POINT OCT-DEC 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS G

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	0.	0.	0.	0.	0.	0.	0.
NNE	22.	1.	0.	0.	0.	0.	23.
NE	29.	4.	0.	0.	0.	0.	33.
ENE	5.	0.	0.	0.	0.	0.	5.
E	4.	0.	0.	0.	0.	0.	4.
ESE	2.	0.	0.	0.	0.	0.	2.
SE	1.	0.	0.	0.	0.	0.	1.
SSE	0.	0.	0.	0.	0.	0.	0.
S	0.	1.	0.	0.	0.	0.	1.
SSW	0.	0.	0.	0.	0.	0.	0.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	0.	0.	0.	0.	0.	0.
WNW	0.	0.	0.	0.	0.	0.	0.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	0.	0.	0.	0.	0.	0.	0.
TOTAL	63.	6.	0.	0.	0.	0.	69.

CALM 0.

INDIAN POINT OCT-DEC 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS F

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	3.	1.	0.	0.	0.	0.	4.
NNE	33.	4.	0.	0.	0.	0.	37.
NE	137.	46.	0.	0.	0.	0.	183.
ENE	18.	2.	0.	0.	0.	0.	20.
E	12.	1.	0.	0.	0.	0.	13.
ESE	12.	0.	0.	0.	0.	0.	12.
SE	11.	2.	0.	0.	0.	0.	13.
SSE	2.	4.	0.	0.	0.	0.	6.
S	0.	15.	1.	0.	0.	0.	16.
SSW	0.	1.	0.	0.	0.	0.	1.
SW	0.	2.	0.	0.	0.	0.	2.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	0.	0.	0.	0.	0.	0.
WNW	0.	0.	0.	0.	0.	0.	0.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	0.	0.	0.	0.	0.	0.	0.
TOTAL	228.	78.	1.	0.	0.	0.	307.

CALM 0.

INDIAN POINT OCT-DEC 1990
10 METER WIND SPEED & DIR. WITH 60-10 METER DELTA T
PASQUILL CLASS E

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	15.	28.	0.	0.	0.	0.	43.
NNE	41.	48.	5.	0.	0.	0.	94.
NE	156.	29.	1.	0.	0.	0.	186.
ENE	50.	7.	0.	0.	0.	0.	57.
E	33.	3.	0.	0.	0.	0.	36.
ESE	25.	4.	0.	0.	0.	0.	29.
SE	24.	17.	0.	0.	0.	0.	41.
SSE	12.	63.	3.	0.	0.	0.	78.
S	5.	69.	23.	3.	3.	0.	103.
SSW	1.	5.	1.	0.	0.	0.	7.
SW	2.	4.	0.	0.	0.	0.	6.
WSW	3.	6.	2.	0.	0.	0.	11.
W	3.	8.	0.	0.	0.	0.	11.
WNW	8.	11.	0.	0.	0.	0.	19.
NW	7.	15.	7.	1.	0.	0.	30.
NNW	4.	21.	7.	1.	0.	0.	33.
TOTAL	389.	338.	49.	5.	3.	0.	784.

CALM 2.