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1979

SEMIANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT
RERR-7

SALEM NUCLEAR GENERATING STATION
SALEM UNIT NO.1

DOCKET NO. 50-272
OPERATING LICENSE NO. DPR-70

MARCH 1980

DPR 70

REPORT NO. RERR-7

UNIT NO. 1
RADIOACTIVE EFFLUENT RELEASE REPORT
JULY - DECEMBER 1979

SALEM NUCLEAR GENERATING STATION
Public Service Electric and Gas Company

M P79 43/33

SALEM NUCLEAR GENERATING STATION
50-272

UNIT NO. 1
RADIOACTIVE EFFLUENT RELEASE REPORT
July, 1979 to December, 1979

Introduction

This report, RERR-7, summarizes the release of radioactive materials in liquid, gaseous and solid form from Salem Unit 1 for the period July 1, 1979 to December 31, 1979. This report was prepared in the format specified in USNRC Regulatory Guide 1.21.

The station was shut down for refueling on April 4, 1979. It was necessary for some modifications to be made on plant systems and as a result the station did not achieve criticality again until December 1, 1979.

Release of radioactive materials from the Salem station during the reporting period were within the limits set forth in the Environmental Technical Specifications and calculated radiation exposures to off-site individuals were small fractions of the limits set forth in 10CFR20 and within Appendix I to 10CFR50 requirements.

A. SUMMARY INFORMATION

1.0 Regulatory Limits

Symbols utilized in the equations listed below under Sections 1.1 and 1.2 are the same as those used in the Salem Environmental Technical Specifications (ETS). The symbol Q as explained in Section 2.3.3 of the ETS is the release rate of the gaseous activity in units of curies per second. The K, L, M and N terms are actually site dependent dose conversion factors. The equations listed below in Sections 1.1 and 1.2 take into consideration the release point location, building wake effects and physical characteristics of the radionuclides released.

1.1 Fission and Activation Gases

Gaseous releases from the nuclear units are limited such that at no time will releases of gaseous radioactive materials cause a member of the general public to be exposed to an annual dose rate in excess of 500 mrem to the entire body or 3 rem to the skin in conformance with the requirements of 10CFR20.

Gaseous releases from the units are further restricted such that when releases are averaged over a calendar quarter no member of the general public will be exposed to an annual dose rate in excess of 20 millirads of gamma radiation or 40 millirads of beta radiation.

In addition, it is required that air doses averaged over a twelve month period be less than 40 and 80 millirads for gamma and beta radiation respectively.

At any instant the release rate of radioactive gases must satisfy the following equations whose basis is 10CFR20.

$$2.0\ Q_{tv} * K_v \leq \ ]$$

$$0.33\ Q_{tv} I (L_v + 1.1\ N_v) \leq 1$$

When averaged over a calendar quarter the release rate for radioactive gases must satisfy the following equation. The basis for these equations is 10CFR50 Appendix I.

$$13\ Q_{tv}*N_v \leq 1$$

$$6.3\ Q_{tv}*M_v \leq 1$$

The release limit Q is therefore calculated to be 5.91E4 microcuries/sec for the 4th quarter. There were no measurable fission or activation gases released during the third quarter.

When averaged over any twelve consecutive month period, the release rate for radioactive gases must satisfy the following equation. The basis for this equation is 10CFR50 Appendix I.

$$25\ Q_{tv}*N_v \leq 1$$

$$23\ Q_{tv}*M_v \leq 1$$

The release limits of radioactive gases for the Salem Nuclear Generating Station are not fixed numbers, but depend upon the radioactive isotopes present in the effluent.

1.2 Iodine and Particulates, Half Life > 8 days

The regulatory limits for iodines and particulates are listed below.

Releases of iodine and particulates are restricted such that no member of the general public will receive a dose rate in excess of 1.5 rem to the thyroid.

Releases of iodines and particulates are further restricted to prevent any member of the general public from receiving a dose rate in excess of 30 mrem in a calendar quarter or 60 mrem in any twelve month period. The equations which govern these conditions are listed below:

At any instant of time the release rate for radioactive iodines and particulates material with a half life greater than 8 days is limited by the equation below. The basis for this equation is 10CFR20.

$$(1.5 \times 10^5)\ Q_v \leq 1$$

During any calendar quarter the release limit is governed by the equations listed below. The basis for these equations is 10CFR50 Appendix I.

$$\text{2 curies of I-131}$$
$$\text{and}$$
$$Q_v \times 13\ (1.5\ 10^5) \leq 1$$

During any twelve month period radioactive releases should conform to the following constraints as preferred by 10CFR50 Appendix I.

$$25 \times (1.5 \times 10^5) \times Q_v \leq 1$$
$$\text{and}$$
$$\text{4 curies of I-131}$$

1.3 Liquid Effluents

The regulatory limits for radioactive liquids released from the plant are governed by 10CFR20, Appendix B, Table II, Column 2.

In addition, the following limits apply:

The cumulative release of radioactive effluents, excluding tritium and dissolved gases, shall be less than 10 Ci in a calendar quarter for each unit.

The cumulative release of radioactive effluents, excluding tritium and dissolved gases, shall be less than 20 Ci in any twelve consecutive months.

2.0 Maximum Permissible Concentrations

Regulatory Guide 1.21 requires that the licensee provide the MPC's used in determining allowable release rates for radioactive releases. We have addressed this question below.

a. Fission Gases - MPC values were not used to determine the maximum release rates.

b. Iodines - MPC values were not used to determine the maximum release rates.

c. Particulates, Half Lives > 8 days - MPC limits were not used to determine the maximum release rates.

d. Liquid effluents - MPC values as stated in 10CR20, Appendix B, Table 11, Column 2 were used.

3.0 Average Energy

Regulatory Guide 1.21 requires that the licensee provide the average energy of the radionuclide mixture in releases of fission and activation gases, if applicable.-

Release limits for the SNGS are not based upon average energy, hence, this section does not apply.

4.0 Measurements and Approximation of Total Radioactivity

4.1 Liquid effluents are monitored in accordance with Table 2.3-3 of the Environmental Technical Specifications. During the period of record, all wastes from the chemical drain tank and the laundry and hot shower tanks were routed to the hold-up tanks for monitoring. Technical Specifications require these tanks to be recirculated the equivalent of two tank volumes to produce uniform mixing and sample extraction and analyzation before any releases are made. Batch releases included releases from the waste monitor tanks, waste monitor hold-up tank, and the chemical and volume control tanks. Continuous releases included releases from intermittent blowdown of the steam generators. The predominate gamma emitting isotopes detected continued to be Co59, Co60, Mn54, and H3 (tritium). At no time did releases exceed limits.

4.2 Gaseous effluent streams are monitored in accordance with Table 2.3-4 of the Environmental Technical Specifications. The plant vent is the final release point of all planned gaseous effluents and is continually monitored by four very sensitive Geiger Mueller tubes. The vent is also continuously sampled for iodine and particulates with a Cesco charcoal cartridge and filter paper connected in series to a low volume air sampler. The filter and charcoal are changed weekly, weather permitting, and analyzed on a multichannel analyzer in the laboratory. Sampling is also performed on all gas decay tanks and containment purges prior to release to the environment. The results of these analyses are used as the basis for the cumulative release of gaseous effluents into the environment. All tritium samples were taken by bubbling gas through water and then counting the tritiated water on a liquid scintillation counter.

4.3 The estimated total error of the reported continuous gaseous releases is within 50%. This error is due primarily to variability of waste stream flow rates and changes in isotopic distributions of waste streams between sampling periods. The estimated total error of the reported batch gaseous releases is within 10%.

The estimated total error of reported liquid releases is within 25%.

5.0 Batch Releases

Batch releases of gaseous and liquid effluent are provided in Tables 4A - 4B.

6.0 Unplanned Releases

There were no unplanned releases to an unrestricted area during this reporting period.

Part B. Gaseous Effluents

See Summary Tables 1A - 1C.

Part C. Liquid Effluents

See Summary Tables 2A and 2B.

Part D. Solid Waste

See Summary Table 3.

Part E. Radiological Impact on Man

The calculated individual doses in this section are based on actual locations of nearby residents and farms. The population dose impact is based on the projected 1980 population and historical site specific data i.e., food production, milk production, feed for milch animals and seafood production.

The doses were calculated using methods described in Regulatory Guide 1.109 and represent calculations for the six month reporting interval. Doses from batch and continuous releases were calculated using the meteorological dispersion coefficient X/Q for the period July 1 - December 31, 1979.

Liquid Pathways

Doses to individuals in the population from liquid releases are primarily from the seafood ingestion pathway. The total body dose to an individual was calculated to be 4.50E-3 mrem. The calculated population total body dose was 1.10E-1 person-rem. The highest organ dose from liquid releases was 2.95E-2 mrem to the gastrointestinal tract.

Air Pathways

The resulting whole body and skin doses to an individual were calculated to be 1.55E-4 mrem and 1.76E-4 mrem respectively. The calculated population total body dose was 8.50E-3 person-rem. The average total body dose to the population within fifty miles of the site was 3.34E-7 mrem/person.

Direct Radiation

Direct radiation may be estimated by TLD measurements. One method for comparing TLD measurements is by comparison with preoperational data. TLD measurements on site near the Service Water pumps (location 11S1) and (location 10S1) near the Circulating Water pumps averaged 21.6 and 9.2 mrads/months, respectively, apparently due to trace activity in the Refueling Water Storage Tank.

TLD's at onsite locations 2S1 and 5S1 which are 0.3 miles and 0.9 miles from the reactor containment averaged 5.82 and 4.44 mrads/month respectively. These values are within the statistical variation associated with the preoperation program results which were 4.57 $\pm$ 2.00 and 3.91 $\pm$ 0.62 mrads/month for stations 2S1 and 5S1, respectively.

Part F. Meteorological Data

Cumulative joint wind frequency distribution by atmospheric stability class at the 300 foot elevation is provided for the third and fourth quarters of 1979 as Table 5 and 6. Table 7 provides joint wind frequencies at elevation 300 foot for the fourth quarter during discharges. There was no measureable activity releases from a batch mode operation during the third quarter of 1979 (see Pg. 1).

TABLE 1A
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1979)
GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	3rd Quarter	4th Quarter	Est.Total(1) Error %
A. Fission & activation gases				
1. Total release	Ci		1.04E-01	2.50E+01
2. Average release rate for period	uCi/sec.		1.32E-02	
3. Percent of technical specification limit (See ETS Spec. 2.3.3.b)	%		2.23E-05	
B. Iodines (2)				
1. Total iodine-131	Ci			
2. Average release rate for period	uCi/sec.			
3. Percent of technical specification limit	%			
C. Particulates				
1. Particulates with half-lives> 8 days	Ci		7.57E-04	2.50E+01
2. Average release rate for period	uCi/sec.		9.63E-05	
3. Percent of technical specification limit	%		1.88E-02	
4. Gross alpha radioactivity	Ci			
D. Tritium				
1. Total release	Ci		2.40E-03	2.50E+01
2. Average release rate for period	uCi/sec.		3.05E-04	
3. Percent of technical specification limit	%		N/A	

(1) For batch releases the estimated overall error is within 10%

(2) Iodine was below the minimal detection limit.

TABLE 1B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1979)

GASEOUS EFFLUENTS-ELEVATED RELEASES

Nuclides Released	Unit	CONTINUOUS MODE 3rd Quarter	CONTINUOUS MODE 4th Quarter	BATCH MODE 3rd Quarter	BATCH MODE 4th Quarter
1. Fission gases (1)					
Krypton-85	Ci				
Krypton-85m	Ci				
Krypton-87	Ci				
Krypton-88	Ci				
Xenon-133	Ci				1.04E-01
Xenon-135	Ci				
Xenon-135m	Ci				
Xenon-138	Ci				
Xenon-133m	Ci				
Argon-41	Ci				
Fluorine-18	Ci				
Unidentified	Ci				
Total for period	Ci				1.04E-01
2. Iodines (2)					
Iodine-131	Ci				
Iodine-133	Ci				
Iodine-135	Ci				
Total for period	Ci				
3. Particulates					
Strontium-89	Ci				
Strontium-90	Ci				
Cesium-134	Ci				
Cesium-137	Ci				
Barium-Lanthanum-140	Ci				
Cobalt-60	Ci				7.57E-04
Rubidium-88	Ci				
Gross Alpha	Ci				
Cobalt-58	Ci				
Total For Period	Ci				7.57E-04

(2) Iodine was below the minimal detection limit.

TABLE 1B
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1979)
GASEOUS EFFLUENTS-ELEVATED RELEASES
(Continued)

Nuclides Released	Unit	CONTINUOUS MODE 3rd Quarter	CONTINUOUS MODE 4th Quarter	BATCH MODE 3rd Quarter	BATCH MODE 4th Quarter
4. Titium	Ci				2.40E-03

(1) Other fission gases were below the detectable level (LLD) Approximately less than 6.67 E-07 uCi/ml).

TABLE 1C

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

GASEOUS EFFLUENTS-GROUND-LEVEL RELEASES

Nuclides Releases	Unit	3rd Quarter	4th Quarter	3rd Quarter	4th Quarter

There were no ground level releases for the period of record.

TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1979)

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

	Units	3rd Quarter	4th Quarter	Est. Total Error, %
A. Fission and activation products				
1. Total release (not including tritium, gases, alpha)	Ci	1.88E+00	9.85E-01	2.50E+01
2. Average diluted concentration during period	uCi/ml	1.34E-07	8.42E-08	
3. Percent of applicable limit Tech Spec App. B 2.3.1.b	%	1.88E+01	9.85E+00	
B. Tritium				
1. Total release	Ci	3.55E+00	6.10E+00	2.50E+01
2. Average diluted concentration during period	uCi/ml	2.54E-07	5.21E-07	
3. Percent of applicable limit	%	N/A	N/A	
C. Dissolved and entrained gases				
1. Total release	Ci	0.00E+00	5.85E-05	2.50E+01
2. Average diluted concentration during period	uCi/ml	0.00E+00	5.00E-12	
3. Percent of applicable limit	%	N/A	N/A	
D. Gross alpha radioactivity				
1. Total release	Ci	0.00E+00	0.00E+00	2.50E+01
E. Volume of waste release (prior to dilution - Batch Release)	liters	4.67E+06	3.97E+06	1.00E+01
F. Volume of dilution water used during period - Batch Release)	liters	1.40E+10	1.17E+10	2.50E+01

N/A - Not Applicable

TABLE 2B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1979)

LIQUID EFFLUENTS (1)

		CONTINUOUS MODE		BATCH MODE	
Nuclides Releaseed	Unit	3rd Quarter	4th Quarter	3rd Quarter	4th Quarter
Strontium-89	Ci				
Strontium-90	Ci				
Cesium-134	Ci			1.90E-02	3.04E-02
Cesium-137	Ci			2.57E-02	9.37E-03
Iodine-131	Ci				
Iodine-133	Ci				
Cobalt-58	Ci			7.42E-01	1.53E-01
Cobalt-60	Ci			9.07E-01	6.01E-01
Cadmium-109	Ci			2.08E-03	
Manganese-54	Ci			1.10E-01	1.90E-01
Chromium-51	Ci			4.61E-02	
Cesium-136	Ci				
Zirconium-95	Ci			4.90E-03	1.62E-04
Tin-113	Ci			7.84E-05	
Barium-140	Ci				
Lanthaium-140	Ci				
Cerium-144	Ci				
Tungsten-187	Ci				
Niobium-95	Ci			1.52E-02	8.57E-04
Antimony-124	Ci			4.20E-03	3.42E-04
Tritium	Ci			3.55E+00	6.10E+00
Iron-59	Ci			9.89E-03	
Gross Alpha	Ci				
Total for period (above) excluding H3	Ci			1.88E+00	9.85E-01
Xenon-133m	Ci				
Xenon-133	Ci				
Xenon-135	Ci				5.85E-05
Krypton-88	Ci				

(1) The Lower Limit of Detection (LLD) is approximately 1.00 E-8 uCi/ml (Co 60).

TABLE 3

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

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

1. Type of waste	Units	6-month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m3	7.83E+01	
	Ci	2.85E+01	1.50 E+01
b. Dry compressible waste, contaminated equip., etc.	m3	2.03E+02	
	Ci	1.92E+01	1.50E+01
c. Irradiated components control rods, ect.	m3	0.00E+00	
	Ci	0.00E+00	
d. Other (describe)	m3	0.00E+00	
	Ci	0.00E+00	

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

a.	Cobalt - 58	%	4.33E+01
	Cobalt - 60	%	4.33E+01
	Manganese - 54	%	1.00E+01
	Others	%	4.00E+00
b.	Cobalt - 58	%	7.30E+01
	Cobalt - 60	%	1.10E+01
	Manganese - 54	%	1.00E+01
	Others	%	6.00E+00
c.		%	. E
d.		%	. E
			. E
			. E
			. E

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
18	Truck	Barnwell, South Carolina

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
None	N/A	N/A

TABLE 4A

SALEM NUCLEAR GENERATING STATION (1979)

SUMMARY SHEET FOR RADIOACTIVE EFFLUENTS RELEASED IN A BATCH MODE

BATCH RELEASES ONLY

1. Dates July 1 - Sept. 30, 1979

2. Type of release (Gas)

3. Number of releases during the 3rd Quarter 6.00E+00

4. Total time duration for all releases of type listed above 9.90E+02 minutes

5. Maximum duration for releases of type listed above 3.04E+02 minutes

6. Average duration for all releases of type listed above 1.65E+02 minutes

7. Minimum duration for release of type listed above 9.40E+01 minutes

8. For liquid batch releases only, provide the average stream flow (dilution flow) during the period of release. N/A

TABLE 4A (Cont'd)

SALEM NUCLEAR GENERATING STATION (1979)

SUMMARY SHEET FOR RADIOACTIVE EFFLUENTS RELEASED IN A BATCH MODE

BATCH RELEASES ONLY

1. Dates Oct. 1 - Dec. 31, 1979

2. Type of release (Gas)

3. Number of releases during the 4th Quarter 1.70E+01

4. Total time duration for all releases of type listed above 2.66E+03 minutes

5. Maximum duration for releases of type listed above 7.87E+02 minutes

6. Average duration for all releases of type listed above 1.57E+02 minutes

7. Minimum duration for release of type listed above 8.60E+01 minutes

8. For liquid batch releases only, provide the average stream flow (dilution flow) during the period of release. N/A

TABLE 4B

SALEM NUCLEAR GENERATING STATION (1979)

SUMMARY SHEET FOR RADIOACTIVE EFFLUENTS RELEASED IN A BATCH MODE

BATCH RELEASES ONLY

1. Dates July 1 - Sept. 30, 1979

2. Type of release (Liquid)

3. Number of releases during the 3rd Quarter 6.50E+01

4. Total time duration for all releases of type listed above 2.00E+04 minutes

5. Maximum duration for releases of type listed above 2.34E+03 minutes

6. Average duration for all releases of type listed above 3.08E+02 minutes

7. Minimum duration for release of type listed above 2.50E+01 minutes

8. For liquid batch releases only, provide the average stream flow (dilution flow) during the period of release 1.85E+05 gpm

TABLE 4B (Cont'd)

SALEM NUCLEAR GENERATING STATION (1979)

SUMMARY SHEET FOR RADIOACTIVE EFFLUENTS RELEASED IN A BATCH MODE

BATCH RELEASES ONLY

1. Dates Oct. 1 - Dec. 31, 1979

2. Type of release (Liquid)

3. Number of releases during the 4th Quarter 7.30E+01

4. Total time duration for all releases of type listed above 1.50E+04 minutes

5. Maximum duration for releases of type listed above 4.39E+02 minutes

6. Average duration for all releases of type listed above 2.06E+02 minutes

7. Minimum duration for release of type listed above 9.80E+01 minutes

8. For liquid batch releases only, provide the average stream flow (dilution flow) during the period of release 2.10E+05 gpm

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 7 179 TO 93079

STABILITY CLASS: EXTREMELY UNSTABLE DELTA T <-1.9 ^
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	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	1	0	1
SSE	0	0	1	0	0	0	1
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	1	0	1	0	2

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 2

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 7 179 TO 93079

STABILITY CLASS: MODERATELY UNSTABLE DELTA T -1.9 TO -1.7
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIREC-TION	1-3	4-7	8-12	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	1	0	0	0	0	1
SE	0	0	1	1	1	0	3
SSE	0	0	1	3	0	0	4
S	0	2	1	0	0	0	3
SSW	0	0	1	0	0	0	1
SW	0	1	4	0	0	0	5
WSW	1	0	0	2	2	0	5
W	0	1	0	0	0	0	1
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	1	0	1
NNW	0	0	0	0	0	0	0
TOTAL	1	5	8	6	4	0	24

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 7

TABLE 5
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ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 7 179 TO 93079

STABILITY CLASS: SLIGHTLY UNSTABLE DELTA T -1.7 TO -1.5 °
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIREC-TION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	1	0	0	0	1
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	1	1	2	1	5
SSE	0	3	2	0	1	0	6
S	0	3	2	0	0	0	5
SSW	0	3	1	0	0	0	4
SW	0	2	2	1	0	0	5
WSW	0	0	1	0	2	0	3
W	0	0	0	0	0	0	0
WNW	0	0	0	1	0	0	1
NW	0	0	2	2	0	0	4
NNW	0	0	0	3	0	0	3
TOTAL	0	11	12	8	5	1	37

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 17

TABLE 5
3 of 7

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 7 179 TO 93079

STABILITY CLASS: NEUTRAL DELTA T -1.5 TO -0.5
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIREC-TION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2	11	6	11	5	2	37
NNE	0	5	12	11	3	5	36
NE	1	4	12	18	8	5	48
ENE	0	8	4	2	0	0	14
E	1	6	4	0	0	0	11
ESE	1	4	2	2	0	0	9
SE	1	4	11	13	6	6	41
SSE	2	17	32	43	16	4	114
S	2	17	18	27	3	0	67
SSW	0	8	15	11	1	3	38
SW	2	14	21	14	3	1	55
WSW	1	11	13	3	6	2	36
W	0	8	7	18	8	1	42
WNW	0	7	10	8	2	0	27
NW	0	5	14	25	16	0	60
NNW	2	12	30	15	3	1	63
TOTAL	15	141	211	221	80	30	698

PERIODS OF CALM (HOURS): 1
HOURS OF MISSING DATA: 113

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 7 179 TO 93079

STABILITY CLASS: SLIGHTLY STABLE DELTA T -0.5 TO 1.5 ^
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	3	5	11	16	11	2	48
NNE	0	9	11	21	11	1	53
NE	2	5	15	8	7	3	40
ENE	0	1	1	0	0	0	2
E	1	8	8	4	0	0	21
ESE	1	5	6	9	1	0	22
SE	1	4	11	25	6	7	54
SSE	0	2	13	18	7	3	43
S	0	5	12	22	10	12	61
SSW	0	6	18	19	7	1	51
SW	1	10	16	24	18	0	69
WSW	1	7	19	9	4	0	40
W	4	5	10	23	5	0	47
WNW	0	6	6	12	4	0	28
NW	1	8	12	29	13	2	65
NNW	1	6	11	9	2	0	29
TOTAL	16	92	180	248	106	31	673

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 141

TABLE 5

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 7 179 TO 93079

STABILITY CLASS: EXTREMELY STABLE DELTA T >4.0 °
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	1	7	0	0	0	8
NNE	0	4	8	6	0	0	18
NE	0	9	7	12	9	0	37
ENE	2	1	2	13	1	0	19
E	0	2	4	3	0	0	9
ESE	0	2	5	3	0	0	10
SE	0	8	6	8	9	0	31
SSE	1	2	5	6	4	7	25
S	6	7	10	16	1	3	43
SSW	3	9	7	11	6	0	36
SW	2	8	6	5	1	0	22
WSW	2	7	6	5	1	0	21
W	0	6	13	2	1	0	22
WNW	2	5	6	1	0	0	16
NW	0	5	9	2	0	0	16
NNW	1	6	3	0	0	0	10
TOTAL	19	82	106	93	33	10	343

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 53

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 7 179 TO 93079

STABILITY CLASS: ALL STABILITIES EXCLUDING MISS SPEED/DIR DATA
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIREC-TION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	5	19	25	32	17	4	102
NNE	0	18	31	40	16	6	111
NE	3	18	35	39	27	8	130
ENE	3	11	7	16	1	0	38
E	3	16	18	8	0	0	45
ESE	3	12	13	14	1	0	43
SE	2	17	31	50	25	14	139
SSE	3	26	54	70	28	14	195
S	8	34	43	65	14	15	179
SSW	4	28	42	42	15	4	135
SW	5	35	50	48	22	1	161
WSW	5	26	39	23	15	2	110
W	4	21	30	45	14	1	115
WNW	2	18	25	24	6	0	75
NW	1	18	37	58	30	2	146
NNW	4	25	46	29	5	1	110
TOTAL	55	342	526	603	236	72	1834

PERIODS OF CALM (HOURS): 1
HOURS OF MISSING DATA: 372

TABLE 5
7 of 7

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 10 179 TO 123179

STABILITY CLASS: EXTREMELY UNSTABLE DELTA T <-1.9 ^
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIREC-TION	1-3	4-7	8-12	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	1	0	1
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	1	0	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	0	0	0	0	0	0
TOTAL	1	0	0	0	1	0	2

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 0

TABLE 6
1 of 7

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 10 179 TO 123179

STABILITY CLASS: MODERATELY UNSTABLE DELTA T -1.9 TO -1.7
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	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	2	1	0	3
SSE	0	0	0	2	0	0	2
S	0	0	0	0	0	0	0
SSW	0	0	1	1	0	0	2
SW	0	0	1	0	0	0	1
WSW	0	0	0	0	0	0	0
W	1	0	0	0	1	0	2
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	1	1
NNW	0	0	0	0	0	0	0
TOTAL	1	0	2	5	2	1	11

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 2

TABLE 6

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 10 179 TO 123179

STABILITY CLASS: SLIGHTLY UNSTABLE DELTA T -1.7 TO -1.5
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	1	0	0	1
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	1	1	2
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	1	0	1
SW	0	0	0	0	0	0	0
WSW	0	0	0	1	1	0	2
W	0	0	2	1	5	0	8
WNW	0	0	1	1	2	1	5
NW	0	0	0	0	1	4	5
NNW	0	0	0	0	0	0	0
TOTAL	0	0	4	4	11	6	25

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 1

TABLE 6

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 10 179 TO 123179

STABILITY CLASS: NEUTRAL DELTA T -1.5 TO -0.5
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	3	4	13	0	0	20
NNE	0	2	16	26	4	0	48
NE	0	4	11	36	10	0	61
ENE	0	0	2	3	0	0	5
E	0	0	2	0	0	0	2
ESE	0	1	0	0	0	0	1
SE	0	0	4	4	7	4	19
SSE	1	2	12	4	1	0	20
S	2	4	8	12	17	0	43
SSW	0	4	8	13	10	1	36
SW	1	1	13	13	3	1	32
WSW	0	5	11	15	13	6	50
W	1	4	8	42	30	6	91
WNW	2	3	9	24	31	16	85
NW	0	3	7	25	29	27	90
NNW	0	4	6	15	11	1	37
TOTAL	7	40	121	245	165	62	640

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 37

TABLE 6
4 of 7

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 10 179 TO 123179

STABILITY CLASS: SLIGHTLY STABLE DELTA T -0.5 TO 1.5
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2	7	6	13	2	0	30
NNE	1	7	4	8	1	0	21
NE	1	7	9	11	11	0	39
ENE	0	2	2	4	0	0	8
E	4	3	1	0	0	0	8
ESE	1	4	2	4	1	0	12
SE	1	6	4	8	8	7	34
SSE	0	7	17	24	15	5	68
S	0	7	12	19	30	3	71
SSW	2	5	21	26	14	5	73
SW	1	8	19	32	10	2	72
WSW	2	4	8	19	6	2	41
W	0	5	13	24	32	7	81
WNW	2	2	8	25	25	1	63
NW	0	3	11	44	32	6	96
NNW	1	4	11	21	14	2	53
TOTAL	18	81	148	282	201	40	770

PERIODS OF CALM (HOURS): 1
HOURS OF MISSING DATA: 66

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 10 179 TO 123179

STABILITY CLASS: EXTREMELY STABLE DELTA T >4.0
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	1	1	1	0	0	4
NNE	0	0	3	2	0	0	5
NE	0	1	2	2	1	0	6
ENE	0	1	1	1	0	0	3
E	0	5	6	0	0	0	11
ESE	0	0	1	1	1	0	3
SE	0	0	4	0	2	9	15
SSE	0	0	1	3	2	15	21
S	0	1	6	12	23	6	48
SSW	0	3	3	8	2	0	16
SW	0	2	5	9	6	0	22
WSW	1	1	1	12	15	0	30
W	0	1	8	17	2	0	28
WNW	0	0	2	11	10	0	23
NW	0	2	4	12	11	1	30
NNW	1	4	1	1	3	7	17
TOTAL	3	22	49	92	78	38	282

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 77

TABLE 6

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 10 179 TO 123179

STABILITY CLASS: ALL STABILITIES EXCLUDING MISS SPEED/DIR DATA
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	3	13	12	33	2	0	63
NNE	1	10	24	42	9	0	86
NE	1	14	22	53	24	0	114
ENE	0	6	5	13	0	0	24
E	4	12	9	3	0	0	28
ESE	1	8	4	9	2	0	24
SE	3	7	14	16	23	21	84
SSE	1	15	37	44	32	29	158
S	3	21	35	59	85	13	216
SSW	2	20	43	69	38	12	184
SW	3	16	40	64	23	3	149
WSW	5	12	21	50	39	8	135
W	3	11	34	85	73	13	219
WNW	4	5	20	61	68	18	176
NW	0	10	24	81	72	39	226
NNW	3	12	18	40	28	10	111
TOTAL	37	192	362	722	518	166	1997

PERIODS OF CALM (HOURS): 1
HOURS OF MISSING DATA: 209

TABLE 6
7 of 7

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 111679 TO 121479

STABILITY CLASS: EXTREMELY UNSTABLE DELTA T <-1.9 ^
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	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

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 0

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 111679 TO 121479

STABILITY CLASS: MODERATELY UNSTABLE DELTA T -1.9 TO -1.7 ^
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	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

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 0

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 111679 TO 121479

STABILITY CLASS: SLIGHTLY UNSTABLE DELTA T -1.7 TO -1.5 ^
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	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

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 0

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 111679 TO 121479

STABILITY CLASS: NEUTRAL DELTA T -1.5 TO -0.5
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	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	2	2
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	2	2

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 0

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 111679 TO 121479

STABILITY CLASS: SLIGHTLY STABLE DELTA T -0.5 TO 1.5
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	3	0	0	0	0	3
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	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	2	0	0	2
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	2	0	0	2
TOTAL	0	4	0	4	0	0	8

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 1

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 111679 TO 121479

STABILITY CLASS: MODERATELY STABLE DELTA T 1.5 TO 4.0 ^
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	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	1	3	4
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	1	3	4

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 0

ARTIFICIAL ISLAND
SALEM UNIT 1

PERIOD OF RECORD: 111679 TO 121479

STABILITY CLASS: EXTREMELY STABLE DELTA T >4.0 ^
LAPSE RATE IN DEG C/100 METERS
EVALUATED USING DELTA T 300-33 FT

ELEVATION: 300 FEET

****

WINDSPEED (MPH) AT 300 FEET

WIND DIRECTION	1-3	4-7	8-12	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

PERIODS OF CALM (HOURS): 0
HOURS OF MISSING DATA: 0