

# The Light company

Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

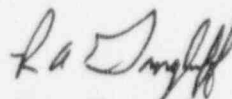
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U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

South Texas Project  
Units 1 and 2  
Docket Nos. STN 50-498, STN 50-499  
Annual Radioactive Effluent Release Report for 1995

Pursuant to the South Texas Project Technical Specification 6.9.1.4 and 10CFR50.36a, attached is the Annual Radioactive Effluent Release Report for 1995. The report covers the period from January 1, 1995 to December 31, 1995.

If you have any questions on this matter, please contact Mr. K. W. Reynolds at (512) 972-3611 extension 6678 or me at (512) 972-7879.



R.A. Gangluff  
Manager,  
Chemistry

MKJ/mj

Attachment: Annual Radioactive Effluent Release Report for 1995

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Project Manager on Behalf of the Participants in the South Texas Project

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Houston Lighting & Power Company  
South Texas Project Electric Generating Station

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File No.: G02

Page 2

c:

Leonard J. Callan  
Regional Administrator, Region IV  
U. S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 400  
Arlington, TX 76011-8064

Rufus S. Scott  
Associate General Counsel  
Houston Lighting & Power Company  
P. O. Box 61067  
Houston, TX 77208

Thomas W. Alexion  
Project Manager  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001 13H15

Institute of Nuclear Power  
Operations - Records Center  
700 Galleria Parkway  
Atlanta, GA 30339-5957

David P. Loveless  
Sr. Resident Inspector  
c/o U. S. Nuclear Regulatory Comm.  
P. O. Box 910  
Bay City, TX 77404-0910

Dr. Joseph M. Hendrie  
50 Bellport Lane  
Bellport, NY 11713

J. R. Newman, Esquire  
Morgan, Lewis & Bockius  
1800 M Street, N.W.  
Washington, DC 20036-5869

Richard A. Ratliff  
Bureau of Radiation Control  
Texas Department of Health  
1100 West 49th Street  
Austin, TX 78756-3189

K. J. Fiedler/M. T. Hardt  
City Public Service  
P. O. Box 1771  
San Antonio, TX 78296

U. S. Nuclear Regulatory Comm.  
Attn: Document Control Desk  
Washington, D. C. 20555-0001

J. C. Lanier/M. B. Lee  
City of Austin  
Electric Utility Department  
721 Barton Springs Road  
Austin, TX 78704

J. R. Egan, Esquire  
Egan & Associates, P.C.  
2300 N Street, N.W.  
Washington, D.C. 20037

Central Power and Light Company  
ATTN: G. E. Vaughn/C. A. Johnson  
P. O. Box 289, Mail Code: N5012  
Wadsworth, TX 77483

J. W. Beck  
Little Harbor Consultants, Inc.  
44 Nichols Road  
Cohasset, MA 02025-1166



SOUTH TEXAS PROJECT

**ANNUAL  
RADIOACTIVE  
EFFLUENT  
RELEASE REPORT  
FOR 1995**

## Report Summary

*During 1995, as in previous years, operation of the South Texas Project created no adverse effects or health risks. The maximum radiation exposure calculated for a hypothetical person living at the boundary of the South Texas Project during 1995 due to operation of the South Texas Project was less than one millirem. For reference, this dose may be compared to the 360 millirem average annual radiation exposure to people in the United States from all sources. Natural radiation sources in the environment contribute most of the radiation exposure to man, while nuclear power operations contribute less than one millirem.*

Radiation Source	Dose (millirem)*
Radon	197
Internal (inside the human body)	39
Medical X-ray	39
Cosmic (sun)	29
Terrestrial	29
Nuclear Medicine	14
Consumer Products	10
Other (including nuclear power plants)	<u>3</u>
<b>TOTAL</b>	<b>360</b>

\*NCRP (1987). National Council on Radiation Protection and Measurements, *Ionizing Radiation Exposure of the Population of the United States*, (Bethesda, Maryland), NCRP Report No. 93.

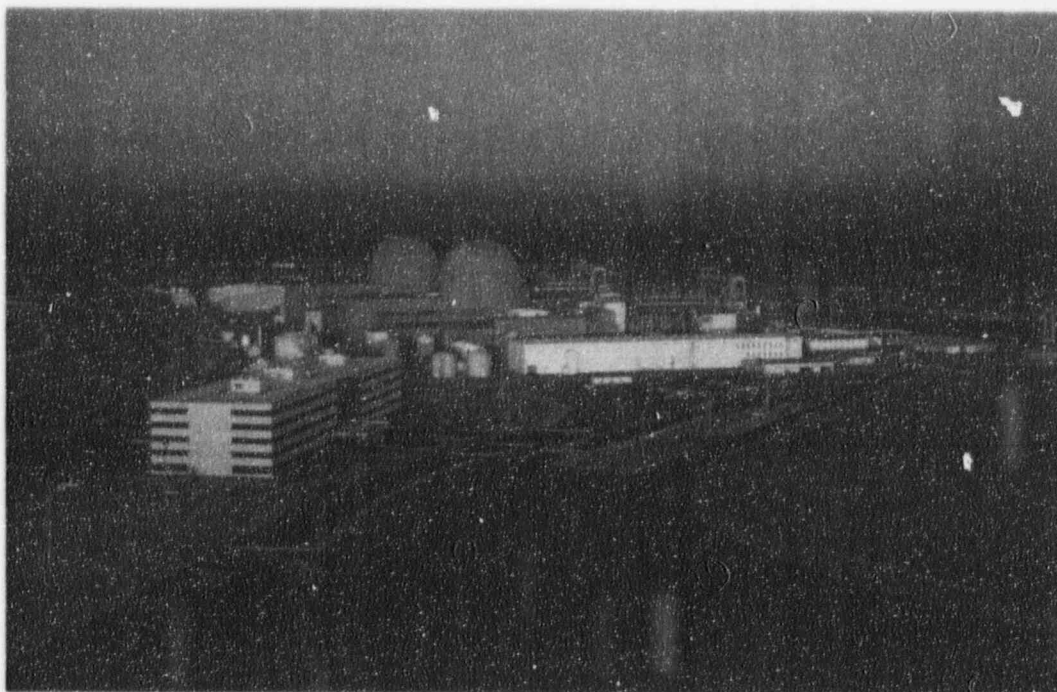
Releases to the environment at the South Texas Project Electric Generating Station have historically been and continue to be well below the regulatory limits. This Annual Radioactive Effluent Release Report summarizes the data describing the radioactive liquid and gaseous releases from the South Texas Project Electric Generating Station during 1995. The radioactive effluents from the South Texas Project are monitored and controlled in accordance with regulatory requirements.

Liquid and gaseous discharges from the South Texas Project are continuously monitored for radioactive content. Samples are also collected from ventilation systems and liquid discharges and analyzed for radioactivity. The sample and analysis methods are verified and augmented using an independent environmental laboratory. Sample results are also periodically verified by the Nuclear Regulatory Commission to check the accuracy and consistency of our analyses. Radioactivity monitors continuously sample the ventilation exhaust systems. On the liquid discharge lines, radioactivity monitors automatically divert or isolate liquid effluents if the radioactivity is higher than expected. These monitors are also equipped with remote alarm indications in the control rooms and health physics offices.



The radiation monitors and the sampling and analysis program provide an accurate determination of the type and quantity of radioactive materials released in plant effluents. Liquid effluents are directed to the Main Cooling Reservoir that is located entirely within the site boundary. The South Texas Project continues to aggressively pursue the reduction of radioactivity in liquid effluents consistent with industry standards. Higher than predicted tritium discharges, still below federal guidelines, in late 1994 and early 1995, were traced to a lithium impurity in one of the demineralizer resins used for water chemistry control. The source of the tritium was identified, the problem isolated and tritium production returned to predicted values. The tritium concentrations in the reservoir remained below Nuclear Regulatory Commission limits and Environmental Protection Agency drinking water standards.

Each year, the effluent monitoring results are summarized in this report and a hypothetical radiation dose to the population in the surrounding area is calculated based on gaseous radioactive effluents, meteorological conditions and liquid radioactive effluents. The hypothetical dose assumes all credible paths for radioactivity to reach a member of the public, such as, consumption of vegetables from a garden, fish from the river, inhalation, and direct exposure. The highest hypothetical dose to an individual at the site boundary was less than 1 millirem. The information presented in this report demonstrates that plant operation is consistently controlled to ensure that radioactive effluents remain below regulatory limits and ensure protection of the public and the environment.



HOUSTON LIGHTING AND POWER COMPANY  
SOUTH TEXAS PROJECT GENERATING STATION UNIT ONE

LICENSE NO. NPF-76

AND

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION UNIT TWO

LICENSE NO. NPF-80

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JANUARY 1, 1995 THROUGH DECEMBER 31, 1995

Prepared by:

Kim W. Reynolds  
Sr. Nuclear Chemist

2/27/96  
Date

Reviewed by:

David L. Phillips  
Certified Health Physicist

2/27/96  
Date

Reviewed by:

La. Longhoff  
Chemistry Manager

2/27/96  
Date



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Windmill photograph courtesy of Joyce Hammock

## 1.0 Introduction

This Annual Radioactive Effluent Release Report for the period January 1, 1995, through December 31, 1995, is submitted in accordance with Appendix A of License NPF-76 and NPF-80, Technical Specifications and the Offsite Dose Calculation Manual.

A single submittal is made for both units which combines those sections that are common. Separate tables of releases and release totals are included where separate processing systems exist.

This report includes an annual summary of hourly meteorological measurements taken during each quarter. This data appears as tables of wind direction and wind speed by atmospheric stability class. All assessments of radiation doses are performed in accordance with the Offsite Dose Calculation Manual.

## 2.0 Supplemental Information for Effluent and Waste Disposal

### Unit Number 1

Type: Pressurized Water Reactor  
Docket No. 50-498  
Cooling Water Source:  
Main Cooling Reservoir

Houston Lighting & Power Co.  
Power (Megawatt Thermal) - 3800  
Initial Criticality (March 8, 1988)

### Unit Number 2

Type: Pressurized Water Reactor  
Docket No. 50-499  
Cooling Water Source:  
Main Cooling Reservoir

Houston Lighting & Power Co.  
Power (Megawatt Thermal) - 3800  
Initial Criticality (March 12, 1989)

## 2.1 Regulatory Limits

### 2.1.1 Fission and activation gases

The **air dose** due to noble gases released in gaseous effluents from each unit to areas at and beyond the Site Boundary shall be limited to the following:

- 2.1.1.1 During any calendar quarter: Less than or equal to 5 millirads for gamma radiation and less than or equal to 10 millirads for beta radiation, and
- 2.1.1.2 During any calendar year: Less than or equal to 10 millirads for gamma radiation and less than or equal to 20 millirads for beta radiation.

## 2.1.2 Iodines and Particulates, half-lives > 8 days

The **dose** to a Member of the Public from Iodine-131, Iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than eight days in gaseous effluents released, from each unit, to areas at and beyond the Site Boundary shall be limited to the following:

2.1.2.1 During any calendar quarter: Less than or equal to 7.5 millirems to any organ; and

2.1.2.2 During any calendar year: Less than or equal to 15 millirems to any organ.

## 2.1.3 Liquid Effluents

The dose or dose commitment to a Member of the Public from radioactive materials in liquid effluents released from each unit to Unrestricted Areas shall be limited to:

2.1.3.1 During any calendar quarter: Less than or equal to 1.5 millirems to the whole body and to less than or equal to 5 millirems to any organ; and

2.1.3.2 During any calendar year: Less than or equal to 3 millirems to the whole body and to less than or equal to 10 millirems to any organ.

## 2.2 Effluent Concentrations Limits

### 2.2.1 Gaseous Effluents

The **dose rate** due to radioactive materials released in gaseous effluents from the site to areas at and beyond the Site Boundary shall be limited to the following:

2.2.1.1 For noble gases: Less than or equal to 500 millirems/year to the whole body and less than or equal to 3000 millirems/year to the skin; and

2.2.1.2 For Iodine-131, Iodine-133, tritium and all radionuclides in particulate form with half-lives greater than eight days: Less than or equal to 1500 millirems/year to any organ.



### 2.2.2 Liquid Effluents

The concentration of radioactive material released in liquid effluents to Unrestricted Areas shall be limited to 10 times the concentrations specified in 10CFR, Part 20, Appendix B, Table II, Column 2, for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2.0E-04 microcurie/milliliter total activity.

### 2.3 Average Energy (Million Electron Volts/Disintegration)

The Average Energy (or E-bar) shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration for the isotopes other than Iodines, with half-lives greater than 15 minutes, making up at least 95% of the total non-iodine activity in the coolant.

E-bar (Million Electron Volts/Disintegration)	<u>0.0873</u> *	Unit 1
	<u>0.171</u> *	Unit 2

The average energy (E-bar) of the radionuclide mixture in gaseous releases of fission and activation gases follows:

E-bar (Million Electron Volts/Disintegration)	<u>0.357</u>	Unit 1
	<u>0.252</u>	Unit 2

\* Includes tritium

### 2.4 Measurement and Approximations of Total Activity

The following discussions detail the methods used to measure and approximate total activity for the following:

Fission and Activation Gases  
Iodines and Particulates  
Liquid Effluents

Tables A3-1 and A4-1 of the South Texas Project Electric Generating Station Offsite Dose Calculation Manual give sampling frequencies and lower limit of detection requirements for the analysis of liquid and gaseous effluent streams.

## 2.4.1 Gaseous Effluents

### Analytical Methods

#### Batch Gaseous Releases

Weekly pre-release grab samples are collected from the plant Reactor Containment Building atmosphere. These samples are analyzed on a Gamma Spectroscopy System utilizing high purity germanium detectors for noble gas, iodine and particulate activity.

The radionuclide concentrations obtained are used in conjunction with the gross noble gas release rate monitoring data collected by the radiation monitoring system to estimate the release rate of each radionuclide in the effluent streams.

#### Continuous Gaseous Releases

Periodic noble gas and tritium grab samples are taken from the continuous release points (i.e., the Unit Vent, and secondary steam leakage). Continuous sampling for particulates and iodine is also performed on the effluent streams. These samples are analyzed for gross alpha and gamma radionuclides, as described above for batch releases. Strontium-89 and Strontium-90 analyses are performed by an offsite laboratory.

## 2.4.2 Liquid Effluents

### Analytical Methods

#### Liquid Releases

Liquid effluents that are processed by the liquid waste processing system are released as batches. Liquid effluents resulting from primary to secondary leakage or other plant operations are tracked as continuous releases. For batch releases, representative pre-release grab samples are taken and analyzed in accordance with Table A3-1 of the Offsite Dose Calculation Manual. For continuous releases, representative samples are collected weekly and analyzed. Radionuclide analyses are performed using a Gamma Spectroscopy System. Aliquots of each pre-release batch sample and of representative samples for continuous releases are composited in accordance with the requirements in Table A3-1 of the Offsite Dose Calculation Manual. Gross alpha determinations are made using a Gas-Flow Proportional Counting System. Tritium concentrations are determined using Liquid Scintillation Counting techniques. Dissolved and entrained gas concentrations are determined by counting grab samples on the Gamma Spectroscopy System. Strontium-89, Strontium-90, and Iron-55 determinations are performed by an offsite laboratory. The radionuclide concentrations obtained are used with the total volume for each batch release.

## 2.5 Batch Releases

Liquid and gaseous summaries are compiled from permits generated using the Nuclear Data Effluent Management System and plant procedures. Liquid batch releases are accounted for by individual permits. Gaseous batch releases are accounted for by weekly permits. Batch times represent the actual period of releases.

### 2.5.1 Liquid (Unit 1)

Liquid (Unit 1)	Quarter 1	Quarter 2	Quarter 3	Quarter 4
a. Number of batch releases	102	72	43	58
b. Total time period for batch releases (minutes)	4622	3444	2080	2687
c. Maximum time period for a batch release (minutes)	52	52	51	51
d. Average time period for batch releases (minutes)	45	48	48	46
e. Minimum time period for a batch release (minutes)	0.3	39	38	31

### 2.5.2 Gaseous (Unit 1)

Gaseous (Unit 1)	Quarter 1	Quarter 2	Quarter 3	Quarter 4
a. Number of batch releases	56	56	56	66
b. Total time period for batch releases (minutes)	22919	5318	969	919
c. Maximum time period for a batch release (minutes)	5685	39	84	89
d. Average time period for batch releases (minutes)	409	95	17	14
e. Minimum time period for a batch release (minutes)	4	4	5	4

### 2.5.3 Liquid (Unit 2)

Liquid (Unit 2)	Quarter 1	Quarter 2	Quarter 3	Quarter 4
a. Number of batch releases	26	36	90	89
b. Total time period for batch releases (minutes)	1138	1686	4500	4160
c. Maximum time period for a batch release (minutes)	52	52	53	53
d. Average time period for batch releases (minutes)	44	47	50	47
e. Minimum time period for a batch release (minutes)	1	17	34	4

### 2.5.4 Gaseous (Unit 2)

Gaseous (Unit 2)	Quarter 1	Quarter 2	Quarter 3	Quarter 4
a. Number of batch releases	73	62	67	57
b. Total time period for batch releases (minutes)	1288	1175	827	21289
c. Maximum time period for a batch release (minutes)	56	54	42	4977
d. Average time period for batch releases (minutes)	18	19	12	373
e. Minimum time period for a batch release (minutes)	5	7	5	4

## 2.6 Abnormal (Unplanned) Releases

### 2.6.1 Liquid (Unit 1)

Liquid (Unit 1)	Quarter 1 1995	Quarter 2 1995	Quarter 3 1995	Quarters 4 1995
a. Number of releases	0	0	0	0
b. Total activity released (curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00

### 2.6.2 Gaseous (Unit 1)

Gaseous (Unit 1)	Quarter 1	Quarter 2	Quarter 3	Quarter 4
a. Number of releases	0	0	0	0
b. Total activity released (curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00

### 2.6.3 Liquid (Unit 2)

Liquid (Unit 2)	Quarter 1	Quarter 2	Quarter 3	Quarter 4
a. Number of releases	0	0	0	0
b. Total activity released (curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00

### 2.6.4 Gaseous (Unit 2)

Gaseous (Unit 2)	Quarter 1	Quarter 2	Quarter 3	Quarter 4
a. Number of releases	0	0	0	0
b. Total activity released (curies)	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## 2.7 Estimate of Total Error

### 2.7.1 Liquid Effluents

The maximum error associated with volume and flow measurements, based upon plant calibration practice, is estimated to be  $\pm 1.27\%$ . The error associated with the flow measurement is small in relation to the counting uncertainty of the radionuclide concentration analysis.

The average uncertainty associated with counting measurements is 10% or less at the 95% confidence level.

The error associated with dilution volume is estimated to be  $\pm 10\%$ .

### 2.7.2 Gaseous Effluents

The maximum error associated with monitor readings, sample flow, vent flow, sample collection, monitor calibration and laboratory procedures are collectively estimated to be:

Fission and Activation Gases Low Activity (less than 10 uCi/sec)	$\pm 100\%$
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Fission and Activation Gases High Activity (greater than or equal to 10 uCi/sec)	$\pm 20\%$
Iodines	$\pm 25\%$
Particulates	$\pm 25\%$
Tritium	$\pm 50\%$

The average uncertainty associated with counting measurements is 10% or less at the 95% confidence level for fission and activation gases, iodines, particulates and tritium.

### 2.7.3 Solid Radioactive Waste

The error associated in determining the contents and volume of solid radioactive waste shipments is estimated to be  $\pm 5\%$  and  $\pm 1\%$ , respectively.

## 2.8 Solid Waste Shipments

A total of fourteen (14) shipments of radioactive dry active waste and resin were made during the reporting period. A summary of the data is provided in the Solid Waste and Irradiated Fuel Shipments Table.

## 2.9 Radiological Impact on Man

The data for the period January 1, 1995, through December 31, 1995, is provided in the Dose Accumulation and the Summary of Direct Radiation Table (Appendix A). The following dilution factors and dilution water flows were used for assessing the radiation doses due to radioactive liquid effluents released to Unrestricted Areas.

Receptor Location	ODCM <sup>(1)</sup> Dilution Factor	Dilution Water Flow Cubic Feet/Second	Dilution Water Flow Liters/Year	Dilution Water Flow Liters/Quarter
Colorado River	1.0	600	5.36E+11	1.34E+11
Matagorda Bay	163	97800	8.73E+13	2.18E+13
Little Robbins Slough Area	0.0305	18.3	1.63E+10	4.08E+09

<sup>(1)</sup> Offsite Dose Calculation Manual factor

The dilution water flow used to estimate the individual dose due to ingestion of saltwater fish and saltwater invertebrates (shrimp) harvested from the Colorado River was 5.36E+11 liters per year for the years of 1989 through 1995. The dilution water flow



used to estimate the individual dose due to ingestion of saltwater fish and saltwater invertebrates harvested from the Matagorda Bay was  $8.73\text{E}+13$  liters per year for the years of 1993 through 1995 as the result of a diversion channel that routes the Colorado River into Matagorda Bay. The dilution water flow used to estimate the individual dose due to ingestion of freshwater fish from the Little Robbins Slough Area was  $1.63\text{E}+10$  liters per year for the years 1989 through 1995. These dilution water flows were used for estimating individual dose due to shoreline deposits. The radioactivity reported in the Liquid Effluent tables is the amount released to the Main Cooling Reservoir and does not contribute to dose until the radioactivity is released to unrestricted areas. In order to estimate the doses due to liquid effluents, the radioactivity reported must be adjusted by the values listed in the Offsite Dose Calculation Manual, Table B4-1, "Radionuclide Fraction Leaving STPEGS Via Liquid Routes".

## 2.10 Meteorological Data

The 1995 meteorological data is presented in the form of joint frequency tables. Each quarter contains eight tables, one for each stability class and one for all classes combined. The Gaseous Effluent Tables and Section 2.5 of this report list batch releases for time periods when Reactor Containment Building's pressure was equalized with ambient atmosphere. The release rates during these periods were not more than ten times the average release rate. The number of such pressure equalization events is large and distributed uniformly over the quarter. Therefore, the average quarterly meteorological data apply for these releases. No joint frequency tables are provided in this report for these release periods from the Reactor Containment Building.

## 2.11 Lower Limit of Detection

The Lower Limit of Detection (an a priori limit) is defined as the smallest concentration of radioactive material in a sample that will yield a net count above system background that will be detected with 95% probability, and only a 5% probability of falsely concluding that a blank observation represents a "real" signal. A zero (0) value in the attached tables indicates no activity detected.

## 2.12 Dose to Members of the Public

### 2.12.1 Dose to Members of the Public from Direct Radiation

The Offsite Dose Calculation Manual includes the direct radiation from plant structures as a component of the dose to a hypothetical, highest exposed member of the public due to plant operations. The Offsite Dose Calculation Manual allows measurements made near plant structures to be used in these calculations following suitable adjustments for distance and exposure time. In 1995 numerous Thermoluminescent Dosimeters were placed along the fence to the protected area surrounding Units 1 and 2 of the South Texas Project Electric Generating Station. The results of these measurements are shown in

Table 1 and Figure 1 of Appendix A. The values in the table show that in 1995 exposure measured at all Thermoluminescent Dosimeter monitoring stations was not greater than the natural background. The base background dose rate was calculated from 1986 site perimeter Thermoluminescent Dosimeter data and is typical of the exposure rate that existed in the area of South Texas Project Electric Generating Station prior to plant operations.

However, field surveys taken around the Onsite Staging Facility following radioactive waste transfers are used to provide data for exposure to a member of the public. Using the time a member of the public might be exposed and the distance to the exposure location, the dose to a hypothetical member of the public can be estimated. The Offsite Dose Calculation Manual requires examination of three such individuals: a member of the public who drives past the South Texas Project Electric Generating Station while commuting to work, a member of the public who visits the South Texas Project Electric Generating Station Visitor's Center, and a member of the public who tours the site outside the protected area fence. The following calculation uses Onsite Staging Facility survey data from Table 2 of Appendix A to calculate the dose to a member of the public who drives past the South Texas Project Electric Generating Station each day while commuting to work. This example provides the highest dose estimate of the three exposure possibilities listed in the Offsite Dose Calculation Manual. This hypothetical member of the public is exposed for a period of about five minutes each time he drives past the South Texas Project Electric Generating Station. He approaches to within 3940 feet of the Onsite Staging Facility which was surveyed at a distance of about 52 feet.

$$(52 \text{ feet} / 3940 \text{ feet})^2 * (\text{millirem/hour}) * 0.085 \text{ hour/trip} * 2 \text{ trips/work-day} * (\text{work-days/period}) = \text{millirem/period}$$

where

millirem/hour = highest exposure rate around the Onsite Staging Facility for a given integration period

0.085 hour/trip = average time to drive around site on Farm to Market Road 521

2 trips/day = commute to and from work each day

work-days/period = work days in a given time period

52 feet = distance at which dose rate estimated around the Onsite Staging Facility

3940 feet = approximate distance (closest) from Onsite Staging Facility to Farm to Market Road 521

$$(52/3940)^2 =$$

$$\text{distance correction factor} = 1.74 \times 10^{-4}$$

Table 2 of Appendix A contains the data and summations for each period of time radioactive waste was stored at the Onsite Staging Facility. The integrated dose at the end of the table represents the dose to an individual commuting past the South Texas Project Electric Generating Station five days a week (less holidays) during 1995. This whole body dose of about 0.00076 millirem in a year may be added to the dose calculated for effluent releases for comparison with the limits of 40CFR190.

#### 2.12.2 Dose to Members of the Public from Radioactive Effluents

During 1995, the total body dose to a real individual from radioactive effluents and direct radiation was 0.0274 millirem. This total represents approximately 0.1% of the limits of 40CFR190. This individual, an adult, resides in the West-Southwest Sector, approximately 4000 meters from the site. This individual receives shoreline exposure from Little Robbins Slough for 12 hours per year and consumes 21 kilograms of fish taken from Little Robbins Slough. This individual receives a submersion dose from noble gases and dose from inhaled radioactive particulates, radioiodines, and tritium. This adult consumes 64 kilograms of vegetables that were grown at the residence and consumes 110 kilograms of meat that grazed at the residence.

### 3.0 Technical Specifications and Offsite Dose Calculation Manual Controls Reporting Requirements

#### 3.1 Radioactive Waste Treatment System Design Modification Description (reference, Offsite Dose Calculation Manual Controls, 6.15)

No major design modifications were made to the liquid, gaseous, or solid radioactive waste treatment systems during this reporting period.

#### 3.2 Inoperable Effluent Monitoring Instrumentation Explanation (reference, Offsite Dose Calculation Manual Controls, 6.9.1.4)

3.2.1 For 1995, inoperable liquid effluent monitoring instruments were corrected within the time specified in Sections 3.3.3.10 of Offsite Dose Calculation Manual Controls.

3.2.2 For the period May 23, 1995, 07:28 to 09:15, explanations of why inoperable gaseous effluent monitoring instrumentation was not discovered and the Action Statements of the Offsite Dose Calculation Manual Controls, Table 3.3-13 were not performed are as follows:

During maintenance activities associated with reinstallation of the isokinetic flow assemblies for Unit 1 Noble Gas Activity Monitor, Iodine and Particulate Sampler, and Iodine and Particulate Monitors, the sample flows to these monitors and samplers were secured. These monitors and samplers were declared inoperable by the Unit Supervisor without all of the compensatory actions being performed. For a period of 109 minutes, the unit vent gaseous effluent was not monitored for radioactive gases, particulate, and iodines. After discovery, the release of radioactive gaseous effluents from the unit vent was suspended. After sample flow was established for these monitors and samplers, the unit vent flow was restarted. A review of other radiation monitors' ten-minute and hourly trends was performed. Based on this review, no radioactive gases, particulates and iodines were released for this time period. This event was documented and investigated using Condition Report 95-7416.

3.3 Gas Storage Tank Curie Limit Violation Description (reference, Offsite Dose Calculation Manual Controls, 6.9.1.4)

The Reactor Coolant System Vacuum Degassing System was not used during this reporting period. Therefore, the quantity of radioactive material in the Reactor Coolant System Vacuum Degassing System Storage Tanks did not exceed the limits set forth in Section 3.11.2.6 of Technical Specifications.

3.4 Unprotected Outdoor Tank Curie Limit Violation Description (reference, Offsite Dose Calculation Manual Controls, 6.9.1.4)

There are no Unprotected Outdoor Tanks at South Texas Project Electric Generating Station.

3.5 Abnormal (Unplanned) Release Description (reference, Offsite Dose Calculation Manual, 6.9.1.4)

No abnormal (unplanned) releases occurred during this report period.

3.6 Radioactive Waste Process Control Program Changes (reference, Technical Specifications, 6.13)

There were no changes to the Radioactive Waste Process Control Program during this reporting period.

3.7 Offsite Dose Calculation Manual Changes (reference, Technical Specifications, 6.13)

There were no changes to the Offsite Dose Calculation Manual during this reporting period.

3.8 Annual Land Use Census (reference, Offsite Dose Calculation Manual Controls, 3.12.2.a)

3.8.1 The resident who was in the SSE Sector has moved, and no other resident has replaced this individual.

3.8.2 On April 23 and April 24, 1995, a "catch and release" fishing tournament was held on the east and northeast banks of the Main Cooling Reservoir for employees, contractors and family members over ten years old.

3.9 Revision to Annual Radioactive Effluent Release Report for 1994

A permit error for the dilution water volume used for one liquid batch release discharged on November 10, 1994, resulted in the incorrect dilution water volume listed in the 1994 report. Appendix B includes the corrected summation report for all liquid effluent for the third and fourth quarter of 1994 for Unit 1.



# DATA TABLES





**GASEOUS EFFLUENTS FOR 1995**

SITE:South Texas Project Electric Generating Station  
UNIT:1

HOUSTON LIGHTING & POWER  
SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
ALL AIRBORNE EFFLUENTS

Unit: 1

Starting : 1-Jan-1995 Ending : 30-Jun-1995

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
1. TOTAL RELEASE	CURIES	2.489E+00	7.122E-01	100
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	3.201E-01	9.058E-02	
3. PERCENT OF LIMIT (2.70E+05 uCi/sec) %		1.185E-04	3.355E-05	
-----				
B. RADIOIODINES				
1. TOTAL IODINE-131 + IODINE-133	CURIES	6.956E-06	9.915E-07	25
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	8.946E-07	1.261E-07	
3. PERCENT OF LIMIT (4.00E-02 uCi/sec) %		2.236E-03	3.152E-04	
-----				
C. PARTICULATES				
1. PARTICULATES(HALF-LIVES>8 DAYS)	CURIES	3.052E-05	2.213E-05	25
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	3.925E-06	2.814E-06	
3. PERCENT OF LIMIT (3.00E-01 uCi/sec) %		1.308E-03	9.382E-04	
4. GROSS ALPHA RADIOACTIVITY	CURIES	0.000E+00	0.000E+00	
-----				
D. TRITIUM				
1. TOTAL RELEASE	CURIES	1.230E+02	2.091E+01	50
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	1.582E+01	2.660E+00	
3. PERCENT OF LIMIT (1.80E+05 uCi/sec) %		8.789E-03	1.478E-03	
-----				

SITE:South Texas Project Electric Generating Station  
UNIT:1

HOUSTON LIGHTING & POWER

Unit 1

REPORT CATEGORY : SEMIANNUAL AIRBORNE GROUND LEVEL CONTINUOUS AND  
: BATCH RELEASES. TOTALS FOR EACH NUCLIDE RELEASED.  
TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES  
REPORTING PERIOD : QUARTER # 1 AND QUARTER # 2 YEAR 1995

		CONTINUOUS MODE		BATCH MODE	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
NUCLIDES RELEASED	UNIT				
FISSION GASES					
Argon-41	CURIES	0.00E+00	0.00E+00	3.79E-01	1.29E-01
Xenon-133	CURIES	1.24E+00	5.63E-01	1.36E-01	1.81E-02
Xenon-135	CURIES	7.23E-01	0.00E+00	2.11E-03	1.47E-03
TOTAL FOR PERIOD	CURIES	1.97E+00	5.63E-01	5.18E-01	1.49E-01
IODINES					
Iodine-131	CURIES	6.41E-06	9.91E-07	0.00E+00	0.00E+00
Iodine-133	CURIES	0.00E+00	0.00E+00	5.38E-07	0.00E+00
TOTAL FOR PERIOD	CURIES	6.41E-06	9.91E-07	5.38E-07	0.00E+00
PARTICULATES					
Cobalt-58	CURIES	1.97E-05	1.93E-05	3.38E-06	2.69E-06
Cobalt-60	CURIES	0.00E+00	1.83E-08	0.00E+00	0.00E+00
Chromium-51	CURIES	7.39E-06	5.88E-08	0.00E+00	0.00E+00
Cesium-137	CURIES	0.00E+00	1.68E-09	0.00E+00	0.00E+00
Iron-59	CURIES	0.00E+00	6.58E-09	0.00E+00	0.00E+00
Manganese-54	CURIES	0.00E+00	5.20E-09	0.00E+00	0.00E+00
Niobium-95	CURIES	0.00E+00	6.78E-09	0.00E+00	0.00E+00
Antimony-124	CURIES	0.00E+00	4.12E-08	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	2.71E-05	1.94E-05	3.38E-06	2.69E-06
OTHER					
Hydrogen-3 (Tritium)	CURIES	1.22E+02	2.07E+01	6.27E-01	1.84E-01
TOTAL FOR PERIOD	CURIES	1.22E+02	2.07E+01	6.27E-01	1.84E-01

SITE:South Texas Project Electric Generating Station  
UNIT:1

HOUSTON LIGHTING & POWER  
SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
ALL AIRBORNE EFFLUENTS

Unit: 1

Starting : 1-Jul-1995 Ending : 31-Dec-1995

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
------------------	-------	-----------	-----------	---------------------

-----  
A. FISSION & ACTIVATION PRODUCTS  
-----

1. TOTAL RELEASE	CURIES	4.817E+00	1.540E+00	100
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	6.060E-01	1.937E-01	
3. PERCENT OF LIMIT (2.70E+05 uCi/sec) %		2.244E-04	7.175E-05	

-----  
B. RADIOIODINES  
-----

1. TOTAL IODINE-131 + IODINE-133	CURIES	0.000E+00	0.000E+00	25
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	0.000E+00	0.000E+00	
3. PERCENT OF LIMIT (4.00E-02 uCi/sec) %		0.000E+00	0.000E+00	

-----  
C. PARTICULATES  
-----

1. PARTICULATES (HALF-LIVES>8 DAYS)	CURIES	3.086E-06	0.000E+00	25
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	3.882E-07	0.000E+00	
3. PERCENT OF LIMIT (3.00E-01 uCi/sec) %		1.294E-04	0.000E+00	
4. GROSS ALPHA RADIOACTIVITY	CURIES	0.000E+00	0.000E+00	

-----  
D. TRITIUM  
-----

1. TOTAL RELEASE	CURIES	4.982E+00	2.972E+00	50
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	6.268E-01	3.739E-01	
3. PERCENT OF LIMIT (1.80E+05 uCi/sec) %		3.482E-04	2.077E-04	

SITE:South Texas Project Electric Generating Station  
UNIT:1

HOUSTON LIGHTING & POWER  
Unit 1

REPORT CATEGORY : SEMIANNUAL AIRBORNE GROUND LEVEL CONTINUOUS AND  
: BATCH RELEASES. TOTALS FOR EACH NUCLIDE RELEASED.  
TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES  
REPORTING PERIOD : QUARTER # 3 AND QUARTER # 4 YEAR 1995

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
Argon-41	CURIES	0.00E+00	0.00E+00	1.89E-01	1.99E-01
Krypton-85	CURIES	0.00E+00	0.00E+00	0.00E+00	8.45E-02
Xenon-133	CURIES	4.58E+00	1.19E+00	3.82E-02	5.65E-02
Xenon-135	CURIES	0.00E+00	0.00E+00	2.03E-03	2.67E-03
TOTAL FOR PERIOD	CURIES	4.58E+00	1.19E+00	2.29E-01	3.43E-01
PARTICULATES					
Cobalt-58	CURIES	3.04E-06	0.00E+00	4.04E-08	0.00E+00
TOTAL FOR PERIOD	CURIES	3.04E-06	0.00E+00	4.04E-08	0.00E+00
OTHER					
Hydrogen-3 (Tritium)	CURIES	4.93E+00	2.94E+00	5.24E-02	2.90E-02
TOTAL FOR PERIOD	CURIES	4.93E+00	2.94E+00	5.24E-02	2.90E-02

SITE:South Texas Project Electric Generating Station  
UNIT:2

HOUSTON LIGHTING & POWER  
SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
ALL AIRBORNE EFFLUENTS

Unit: 2

Starting : 1-Jan-1995 Ending : 30-Jun-1995

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
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A. FISSION & ACTIVATION PRODUCTS

1. TOTAL RELEASE	CURIES	1.388E+01	7.328E+00	100
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	1.785E+00	9.321E-01	
3. PERCENT OF LIMIT (2.70E+05 uCi/sec) %		6.613E-04	3.452E-04	

B. RADIOIODINES

1. TOTAL IODINE-131 + IODINE-133	CURIES	0.000E+00	0.000E+00	25
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	0.000E+00	0.000E+00	
3. PERCENT OF LIMIT (4.00E-02 uCi/sec) %		0.000E+00	0.000E+00	

C. PARTICULATES

1. PARTICULATES (HALF-LIVES > 8 DAYS)	CURIES	4.470E-08	0.000E+00	25
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	5.748E-09	0.000E+00	
3. PERCENT OF LIMIT (3.00E-01 uCi/sec) %		1.916E-06	0.000E+00	
4. GROSS ALPHA RADIOACTIVITY	CURIES	0.000E+00	0.000E+00	

D. TRITIUM

1. TOTAL RELEASE	CURIES	7.300E+00	7.428E+00	50
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	9.387E-01	9.447E-01	
3. PERCENT OF LIMIT (1.80E+05 uCi/sec) %		5.215E-04	5.248E-04	



SITE:South Texas Project Electric Generating Station  
UNIT:2

HOUSTON LIGHTING & POWER  
Unit 2

REPORT CATEGORY : SEMIANNUAL AIRBORNE GROUND LEVEL CONTINUOUS AND  
: BATCH RELEASES. TOTALS FOR EACH NUCLIDE RELEASED.  
TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES  
REPORTING PERIOD : QUARTER # 1 AND QUARTER # 2 YEAR 1995

		CONTINUOUS MODE		BATCH MODE	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
NUCLIDES RELEASED	UNIT				
FISSION GASES					
Argon-41	CURIES	0.00E+00	0.00E+00	1.70E-01	2.17E-01
Krypton-85	CURIES	0.00E+00	0.00E+00	0.00E+00	3.09E-02
Xenon-133	CURIES	1.37E+01	7.07E+00	0.00E+00	0.00E+00
Xenon-133m	CURIES	0.00E+00	0.00E+00	0.00E+00	9.85E-04
TOTAL FOR PERIOD	CURIES	1.37E+01	7.07E+00	1.70E-01	2.49E-01
PARTICULATES					
Cobalt-58	CURIES	0.00E+00	0.00E+00	4.47E-08	0.00E+00
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	4.47E-08	0.00E+00
OTHER					
Hydrogen-3 (Tritium)	CURIES	7.12E+00	7.42E+00	1.74E-01	6.11E-03
TOTAL FOR PERIOD	CURIES	7.12E+00	7.42E+00	1.74E-01	6.11E-03

SITE:South Texas Project Electric Generating Station  
UNIT:2

HOUSTON LIGHTING & POWER  
SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
ALL AIRBORNE EFFLUENTS

Unit: 2

Starting : 1-Jul-1995 Ending : 31-Dec-1995

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
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A. FISSION & ACTIVATION PRODUCTS

1. TOTAL RELEASE	CURIES	6.035E-01	1.685E-01	100
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	7.593E-02	2.120E-02	
3. PERCENT OF LIMIT (2.70E+05 uCi/sec) %		2.812E-05	7.851E-06	

B. RADIOIODINES

1. TOTAL IODINE-131 + IODINE-133	CURIES	0.000E+00	1.384E-05	25
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	0.000E+00	1.742E-06	
3. PERCENT OF LIMIT (4.00E-02 uCi/sec) %		0.000E+00	4.355E-03	

C. PARTICULATES

1. PARTICULATES (HALF-LIVES > 8 DAYS)	CURIES	0.000E+00	4.058E-04	25
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	0.000E+00	5.105E-05	
3. PERCENT OF LIMIT (3.00E-01 uCi/sec) %		0.000E+00	1.701E-02	
4. GROSS ALPHA RADIOACTIVITY	CURIES	0.000E+00	0.000E+00	

D. TRITIUM

1. TOTAL RELEASE	CURIES	2.521E+00	1.059E+00	50
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	3.171E-01	1.332E-01	
3. PERCENT OF LIMIT (1.80E+05 uCi/sec) %		1.761E-04	7.403E-05	

SITE:South Texas Project Electric Generating Station  
UNIT:2

HOUSTON LIGHTING & POWER  
Unit 2

REPORT CATEGORY : SEMIANNUAL AIRBORNE GROUND LEVEL CONTINUOUS AND  
: BATCH RELEASES. TOTALS FOR EACH NUCLIDE RELEASED.  
TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES  
REPORTING PERIOD : QUARTER # 3 AND QUARTER # 4 YEAR 1995

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
Argon-41	CURIES	0.00E+00	0.00E+00	1.26E-01	1.18E-01
Xenon-133	CURIES	4.77E-01	3.41E-02	0.00E+00	1.55E-02
Xenon-135	CURIES	0.00E+00	5.53E-04	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	4.77E-01	3.47E-02	1.26E-01	1.33E-01
IODINES					
Iodine-131	CURIES	0.00E+00	1.38E-05	0.00E+00	3.63E-08
TOTAL FOR PERIOD	CURIES	0.00E+00	1.38E-05	0.00E+00	3.63E-08
PARTICULATES					
Cobalt-58	CURIES	0.00E+00	1.90E-04	0.00E+00	1.52E-04
Cobalt-60	CURIES	0.00E+00	5.61E-06	0.00E+00	1.16E-08
Chromium-51	CURIES	0.00E+00	4.43E-05	0.00E+00	0.00E+00
Manganese-54	CURIES	0.00E+00	2.85E-06	0.00E+00	6.01E-06
Niobium-95	CURIES	0.00E+00	4.07E-06	0.00E+00	5.00E-08
Zirconium-95	CURIES	0.00E+00	0.00E+00	0.00E+00	4.47E-08
TOTAL FOR PERIOD	CURIES	0.00E+00	2.46E-04	0.00E+00	1.58E-04
OTHER					
Hydrogen-3 (Tritium)	CURIES	2.52E+00	1.01E+00	1.15E-03	4.15E-02
TOTAL FOR PERIOD	CURIES	2.52E+00	1.01E+00	1.15E-03	4.15E-02

**LIQUID EFFLUENTS FOR 1995**

SITE:South Texas Project Electric Generating Station  
UNIT:1

HOUSTON LIGHTING & POWER  
SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
ALL LIQUID EFFLUENTS

Unit: 1

Starting : 1-Jan-1995 Ending : 30-Jun-1995

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
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A. FISSION & ACTIVATION PRODUCTS

1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	1.242E-01	4.321E-01	10
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	2.118E-08	8.428E-08	
3. PERCENT OF EC LIMIT (FRACTIONAL)	%	5.275E-02	8.422E-02	

B. TRITIUM

1. TOTAL RELEASE	CURIES	1.640E+03	9.064E+01	10
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	2.796E-04	1.768E-05	
3. % OF LIMIT (1.00E-02 uCi/mL)	%	2.796E+00	1.768E-01	

C. DISSOLVED AND ENTRAINED GASES

1. TOTAL RELEASE	CURIES	4.948E-02	7.126E-04	10
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	8.433E-09	1.390E-10	
3. PERCENT OF LIMIT (2.00E-04 uCi/mL)	%	4.216E-03	6.950E-05	

D. GROSS ALPHA RADIOACTIVITY

1. TOTAL RELEASE	CURIES	0.000E+00	0.000E+00	10
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E. WASTE VOL RELEASED

1. TOTAL PRE-DILUTION VOLUME	LITERS	1.087E+07	1.066E+07	1
2. BATCH PRE-DILUTION VOLUME	LITERS	3.849E+06	2.977E+06	1

F. VOLUME OF DILUTION WATER USED*	LITERS	5.855E+09	5.115E+09	10
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\*"Volume of dilution water used" means the volume of water circulated through the main condenser during the actual time of release. Liquid effluent releases ultimately dilute into the volume of the onsite main cooling reservoir and then into offsite water bodies as described in Section 2.9 of this report.

SITE:South Texas Project Electric Generating Station  
UNIT:1

HOUSTON LIGHTING & POWER  
Unit 1

REPORT CATEGORY : SEMIANNUAL LIQUID CONTINUOUS AND BATCH RELEASES  
: TOTALS FOR EACH NUCLIDE RELEASED.  
TYPE OF ACTIVITY : ALL RADIONUCLIDES  
REPORTING PERIOD : QUARTER # 1 AND QUARTER # 2 YEAR 1995

		CONTINUOUS RELEASES		BATCH	RELEASES
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
NUCLIDE	UNIT				
ALL NUCLIDES					
Silver-110M	CURIES	0.00E+00	0.00E+00	4.67E-05	7.59E-05
Beryllium-7	CURIES	0.00E+00	0.00E+00	4.85E-06	0.00E+00
Cobalt-57	CURIES	0.00E+00	0.00E+00	1.41E-04	6.99E-04
Cobalt-58	CURIES	0.00E+00	7.39E-05	4.43E-02	3.15E-01
Cobalt-60	CURIES	0.00E+00	1.72E-06	1.22E-02	9.31E-03
Chromium-51	CURIES	0.00E+00	4.60E-05	3.45E-03	3.88E-02
Cesium-134	CURIES	0.00E+00	0.00E+00	1.41E-04	0.00E+00
Cesium-137	CURIES	0.00E+00	1.58E-07	7.38E-04	2.39E-04
Iron-55	CURIES	0.00E+00	0.00E+00	2.81E-02	4.46E-02
Iron-59	CURIES	0.00E+00	6.19E-07	1.45E-04	2.94E-03
Hydrogen-3 (Tritium)	CURIES	4.14E-02	2.14E-02	1.64E+03	9.06E+01
Iodine-131	CURIES	0.00E+00	0.00E+00	3.13E-04	0.00E+00
Iodine-132	CURIES	0.00E+00	0.00E+00	2.11E-04	0.00E+00
Iodine-133	CURIES	0.00E+00	0.00E+00	1.29E-04	0.00E+00
Krypton-85	CURIES	0.00E+00	0.00E+00	1.88E-04	4.18E-04
Krypton-85M	CURIES	0.00E+00	0.00E+00	6.00E-06	0.00E+00
Lanthanum-140	CURIES	0.00E+00	0.00E+00	4.42E-06	0.00E+00
Manganese-54	CURIES	0.00E+00	4.89E-07	7.23E-03	8.79E-03
Molybdenum-99	CURIES	0.00E+00	0.00E+00	1.62E-04	0.00E+00
Sodium-24	CURIES	0.00E+00	0.00E+00	7.22E-05	1.94E-06
Niobium-95	CURIES	0.00E+00	6.37E-07	6.16E-05	3.19E-03
OTHER	CURIES	0.00E+00	0.00E+00	2.48E-06	0.00E+00
Antimony-122	CURIES	0.00E+00	0.00E+00	2.50E-03	0.00E+00
Antimony-124	CURIES	0.00E+00	2.30E-05	1.20E-02	3.59E-03
Antimony-125	CURIES	0.00E+00	2.41E-05	9.04E-03	2.87E-03
Selenium-75	CURIES	0.00E+00	0.00E+00	3.10E-04	1.40E-05
Tin-113	CURIES	0.00E+00	0.00E+00	0.00E+00	6.20E-05
Tin-117M	CURIES	0.00E+00	0.00E+00	4.90E-05	1.09E-04
Strontium-92	CURIES	0.00E+00	0.00E+00	1.96E-04	0.00E+00
Technetium-99M	CURIES	0.00E+00	0.00E+00	9.71E-05	0.00E+00
Tellurium-129M	CURIES	0.00E+00	0.00E+00	2.32E-03	0.00E+00
Tellurium-132	CURIES	0.00E+00	0.00E+00	1.16E-04	0.00E+00
Xenon-133	CURIES	0.00E+00	0.00E+00	4.65E-02	2.93E-04
Xenon-133M	CURIES	0.00E+00	0.00E+00	6.55E-04	0.00E+00
Xenon-135	CURIES	0.00E+00	0.00E+00	2.05E-03	0.00E+00
Zinc-65	CURIES	0.00E+00	0.00E+00	0.00E+00	1.48E-05
Zirconium-95	CURIES	0.00E+00	0.00E+00	1.90E-05	1.52E-03
TOTAL FOR PERIOD	CURIES	4.14E-02	2.15E-02	1.64E+03	9.10E+01



SITE:South Texas Project Electric Generating Station  
UNIT:1

HOUSTON LIGHTING & POWER  
SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
ALL LIQUID EFFLUENTS

Unit: 1

Starting : 1-Jul-1995 Ending : 31-Dec-1995

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
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A. FISSION & ACTIVATION PRODUCTS

1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	1.863E-02	3.081E-02	10
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	5.221E-09	7.797E-09	
3. PERCENT OF EC LIMIT (FRACTIONAL)	%	3.960E-02	1.417E-01	

B. TRITIUM

1. TOTAL RELEASE	CURIES	2.634E+02	5.101E+02	10
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	7.384E-05	1.291E-04	
3. % OF LIMIT (1.00E-02 uCi/mL)	%	7.384E-01	1.291E+00	

C. DISSOLVED AND ENTRAINED GASES

1. TOTAL RELEASE	CURIES	5.949E-03	1.391E-02	10
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	1.667E-09	3.520E-09	
3. PERCENT OF LIMIT (2.00E-04 uCi/mL)	%	8.338E-04	1.760E-03	

D. GROSS ALPHA RADIOACTIVITY

1. TOTAL RELEASE	CURIES	0.000E+00	0.000E+00	10
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E. WASTE VOL RELEASED

1. TOTAL PRE-DILUTION VOLUME	LITERS	9.406E+06	4.471E+07	1
2. BATCH PRE-DILUTION VOLUME	LITERS	1.893E+06	2.169E+06	1

F. VOLUME OF DILUTION WATER USED*	LITERS	3.558E+09	3.906E+09	10
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\*"Volume of dilution water used" means the volume of water circulated through the main condenser during the actual time of release. Liquid effluent releases ultimately dilute into the volume of the onsite main cooling reservoir and then into offsite water bodies as described in Section 2.9 of this report.

SITE:South Texas Project Electric Generating Station  
UNIT:1

HOUSTON LIGHTING & POWER

Unit 1

REPORT CATEGORY : SEMIANNUAL LIQUID CONTINUOUS AND BATCH RELEASES  
: TOTALS FOR EACH NUCLIDE RELEASED.  
TYPE OF ACTIVITY : ALL RADIONUCLIDES  
REPORTING PERIOD : QUARTER # 3 AND QUARTER # 4 YEAR 1995

		CONTINUOUS RELEASES		BATCH	RELEASES
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
NUCLIDE	UNIT				
ALL NUCLIDES					
Silver-110M	CURIES	0.00E+00	0.00E+00	3.81E-06	0.00E+00
Bromine-82	CURIES	0.00E+00	0.00E+00	0.00E+00	6.55E-06
Cobalt-57	CURIES	0.00E+00	0.00E+00	3.80E-05	5.50E-05
Cobalt-58	CURIES	0.00E+00	0.00E+00	8.45E-03	9.30E-03
Cobalt-60	CURIES	0.00E+00	0.00E+00	1.93E-03	3.35E-03
Chromium-51	CURIES	0.00E+00	0.00E+00	9.82E-06	5.45E-04
Cesium-137	CURIES	0.00E+00	0.00E+00	1.18E-04	3.87E-05
Cesium-138	CURIES	0.00E+00	0.00E+00	3.49E-05	5.42E-05
Iron-55	CURIES	0.00E+00	0.00E+00	3.48E-03	1.24E-02
Iron-59	CURIES	0.00E+00	0.00E+00	3.30E-06	7.66E-05
Hydrogen-3 (Tritium)	CURIES	5.38E-02	1.79E-01	2.63E+02	5.10E+02
Iodine-131	CURIES	0.00E+00	0.00E+00	0.00E+00	7.07E-04
Iodine-133	CURIES	0.00E+00	0.00E+00	0.00E+00	8.06E-04
Lanthanum-142	CURIES	0.00E+00	0.00E+00	0.00E+00	1.05E-05
Manganese-54	CURIES	0.00E+00	0.00E+00	2.04E-03	8.15E-04
Molybdenum-99	CURIES	0.00E+00	0.00E+00	0.00E+00	6.00E-04
Sodium-24	CURIES	0.00E+00	0.00E+00	4.82E-06	0.00E+00
Niobium-95	CURIES	0.00E+00	0.00E+00	2.23E-05	1.74E-04
Antimony-124	CURIES	0.00E+00	0.00E+00	8.41E-04	1.45E-04
Antimony-125	CURIES	0.00E+00	0.00E+00	1.62E-03	7.60E-04
Tin-113	CURIES	0.00E+00	0.00E+00	0.00E+00	4.80E-06
Tin-117M	CURIES	0.00E+00	0.00E+00	2.45E-06	0.00E+00
Technetium-99M	CURIES	0.00E+00	0.00E+00	0.00E+00	7.53E-04
Tungsten-187	CURIES	0.00E+00	0.00E+00	0.00E+00	7.75E-05
Xenon-133	CURIES	0.00E+00	0.00E+00	5.95E-03	1.29E-02
Xenon-133M	CURIES	0.00E+00	0.00E+00	0.00E+00	2.74E-04
Xenon-135	CURIES	0.00E+00	0.00E+00	0.00E+00	6.88E-04
Zinc-65	CURIES	0.00E+00	0.00E+00	0.00E+00	1.18E-06
Zirconium-95	CURIES	0.00E+00	0.00E+00	3.46E-06	1.00E-04
TOTAL FOR PERIOD	CURIES	5.38E-02	1.79E-01	2.63E+02	5.10E+02

SITE:South Texas Project Electric Generating Station  
UNIT:2

HOUSTON LIGHTING & POWER  
SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
ALL LIQUID EFFLUENTS

Unit: 2

Starting : 1-Jan-1995 Ending : 30-Jun-1995

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
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A. FISSION & ACTIVATION PRODUCTS

1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	1.196E-02	1.497E-02	10
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	8.152E-09	6.017E-09	
3. PERCENT OF EC LIMIT (FRACTIONAL)	%	6.551E-03	6.557E-03	

B. TRITIUM

1. TOTAL RELEASE	CURIES	2.472E+02	3.706E+02	10
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	1.684E-04	1.488E-04	
3. % OF LIMIT (1.00E-02 uCi/mL)	%	1.684E+00	1.488E+00	

C. DISSOLVED AND ENTRAINED GASES

1. TOTAL RELEASE	CURIES	6.166E-04	1.608E-03	10
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	4.201E-10	6.461E-10	
3. PERCENT OF LIMIT (2.00E-04 uCi/mL)	%	2.100E-04	3.230E-04	

D. GROSS ALPHA RADIOACTIVITY

1. TOTAL RELEASE	CURIES	0.000E+00	0.000E+00	10
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E. WASTE VOL RELEASED

1. TOTAL PRE-DILUTION VOLUME	LITERS	7.564E+06	8.520E+06	1
2. BATCH PRE-DILUTION VOLUME	LITERS	9.518E+05	1.481E+06	1

F. VOLUME OF DILUTION WATER USED*	LITERS	1.459E+09	2.480E+09	10
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\*"Volume of dilution water used" means the volume of water circulated through the main condenser during the actual time of release. Liquid effluent releases ultimately dilute into the volume of the onsite main cooling reservoir and then into offsite water bodies as described in Section 2.9 of this report.

SITE:South Texas Project Electric Generating Station  
UNIT:2

HOUSTON LIGHTING & POWER  
Unit 2

REPORT CATEGORY : SEMIANNUAL LIQUID CONTINUOUS AND BATCH RELEASES  
: TOTALS FOR EACH NUCLIDE RELEASED.  
TYPE OF ACTIVITY : ALL RADIONUCLIDES  
REPORTING PERIOD : QUARTER # 1 AND QUARTER # 2 YEAR 1995

		CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
NUCLIDE	UNIT				
ALL NUCLIDES					
Silver-110M	CURIES	0.00E+00	0.00E+00	2.69E-05	6.06E-05
Cobalt-57	CURIES	0.00E+00	0.00E+00	1.45E-05	1.70E-05
Cobalt-58	CURIES	0.00E+00	0.00E+00	8.79E-04	1.86E-03
Cobalt-60	CURIES	0.00E+00	0.00E+00	1.55E-03	3.40E-03
Chromium-51	CURIES	0.00E+00	0.00E+00	3.21E-05	1.56E-04
Cesium-134	CURIES	0.00E+00	0.00E+00	4.03E-05	0.00E+00
Cesium-137	CURIES	0.00E+00	0.00E+00	1.67E-04	1.21E-04
Iron-55	CURIES	0.00E+00	0.00E+00	8.23E-03	8.32E-03
Iron-59	CURIES	0.00E+00	0.00E+00	0.00E+00	7.89E-06
Hydrogen-3 (Tritium)	CURIES	5.21E-02	4.13E-02	2.47E+02	3.70E+02
Krypton-85	CURIES	0.00E+00	0.00E+00	5.06E-04	9.83E-05
Manganese-54	CURIES	0.00E+00	0.00E+00	8.48E-04	9.08E-04
Niobium-95	CURIES	0.00E+00	0.00E+00	0.00E+00	1.29E-05
Antimony-124	CURIES	0.00E+00	0.00E+00	6.96E-06	0.00E+00
Antimony-125	CURIES	0.00E+00	0.00E+00	1.52E-04	9.25E-05
Xenon-133	CURIES	0.00E+00	0.00E+00	1.10E-04	1.51E-03
Zirconium-95	CURIES	0.00E+00	0.00E+00	0.00E+00	2.17E-06
TOTAL FOR PERIOD	CURIES	5.21E-02	4.13E-02	2.47E+02	3.70E+02

SITE:South Texas Project Electric Generating Station  
UNIT:2

HOUSTON LIGHTING & POWER  
SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
ALL LIQUID EFFLUENTS

Unit: 2

Starting : 1-Jul-1995 Ending : 31-Dec-1995

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
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A. FISSION & ACTIVATION PRODUCTS

1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	1.263E-01	1.261E-01	10
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	1.638E-08	2.236E-08	
3. PERCENT OF EC LIMIT (FRACTIONAL)	%	1.495E-02	2.230E-02	

B. TRITIUM

1. TOTAL RELEASE	CURIES	5.094E+02	6.814E+01	10
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	6.607E-05	1.208E-05	
3. % OF LIMIT (1.00E-02 uCi/mL)	%	6.607E-01	1.208E-01	

C. DISSOLVED AND ENTRAINED GASES

1. TOTAL RELEASE	CURIES	1.320E-02	4.867E-03	10
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	1.713E-09	8.629E-10	
3. PERCENT OF LIMIT (2.00E-04 uCi/mL)	%	8.565E-04	4.315E-04	

D. GROSS ALPHA RADIOACTIVITY

1. TOTAL RELEASE	CURIES	0.000E+00	0.000E+00	10
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E. WASTE VOL RELEASED

1. TOTAL PRE-DILUTION VOLUME	LITERS	9.714E+06	9.124E+06	1
2. BATCH PRE-DILUTION VOLUME	LITERS	4.143E+06	3.307E+06	1

F. VOLUME OF DILUTION WATER USED*	LITERS	7.699E+09	5.630E+09	10
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\*"Volume of dilution water used" means the volume of water circulated through the main condenser during the actual time of release. Liquid effluent releases ultimately dilute into the volume of the onsite main cooling reservoir and then into offsite water bodies as described in Section 2.9 of this report.

SITE:South Texas Project Electric Generating Station  
UNIT:2

HOUSTON LIGHTING & POWER  
Unit 2

REPORT CATEGORY : SEMIANNUAL LIQUID CONTINUOUS AND BATCH RELEASES  
: TOTALS FOR EACH NUCLIDE RELEASED.  
TYPE OF ACTIVITY : ALL RADIONUCLIDES  
REPORTING PERIOD : QUARTER # 3 AND QUARTER # 4 YEAR 1995

		CONTINUOUS RELEASES		BATCH	RELEASES
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
NUCLIDE	UNIT				
ALL NUCLIDES					
Silver-110M	CURIES	0.00E+00	0.00E+00	8.92E-05	1.25E-03
Cobalt-57	CURIES	0.00E+00	0.00E+00	6.09E-05	9.91E-05
Cobalt-58	CURIES	0.00E+00	3.65E-05	8.68E-04	3.86E-02
Cobalt-60	CURIES	0.00E+00	0.00E+00	2.61E-02	1.52E-02
Chromium-51	CURIES	0.00E+00	0.00E+00	0.00E+00	1.46E-02
Cesium-134	CURIES	0.00E+00	0.00E+00	1.06E-04	3.36E-06
Cesium-137	CURIES	0.00E+00	0.00E+00	6.40E-04	1.03E-04
Iron-55	CURIES	0.00E+00	0.00E+00	9.40E-02	4.99E-02
Iron-59	CURIES	0.00E+00	0.00E+00	0.00E+00	6.71E-04
Hydrogen-3 (Tritium)	CURIES	2.90E-02	2.10E-02	5.09E+02	6.81E+01
Iodine-131	CURIES	0.00E+00	0.00E+00	1.80E-05	0.00E+00
Krypton-85M	CURIES	0.00E+00	0.00E+00	2.31E-05	6.99E-06
Manganese-54	CURIES	0.00E+00	0.00E+00	2.06E-03	1.15E-03
Molybdenum-99	CURIES	0.00E+00	0.00E+00	6.81E-05	0.00E+00
Sodium-24	CURIES	0.00E+00	0.00E+00	6.19E-05	9.28E-06
Niobium-95	CURIES	0.00E+00	0.00E+00	0.00E+00	1.77E-03
OTHER	CURIES	0.00E+00	0.00E+00	0.00E+00	3.70E-04
Antimony-124	CURIES	0.00E+00	0.00E+00	4.88E-06	1.56E-04
Antimony-125	CURIES	0.00E+00	0.00E+00	2.14E-03	9.57E-04
Tin-113	CURIES	0.00E+00	0.00E+00	0.00E+00	1.13E-05
Technetium-99M	CURIES	0.00E+00	0.00E+00	3.27E-06	0.00E+00
Tellurium-132	CURIES	0.00E+00	0.00E+00	0.00E+00	3.32E-05
Xenon-133	CURIES	0.00E+00	0.00E+00	1.22E-02	4.74E-03
Xenon-133M	CURIES	0.00E+00	0.00E+00	1.77E-04	2.00E-05
Xenon-135	CURIES	0.00E+00	0.00E+00	7.94E-04	9.95E-05
Zirconium-95	CURIES	0.00E+00	0.00E+00	0.00E+00	1.00E-03
TOTAL FOR PERIOD	CURIES	2.90E-02	2.10E-02	5.09E+02	6.82E+01



**SOLID WASTE AND IRRADIATED FUEL SHIPMENTS FOR 1995**

# EFFLUENT AND WASTE DISPOSAL

## 1995 ANNUAL REPORT

### SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

#### A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not Irradiated Fuel)

1. Type of Waste	Unit	12-Month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m <sup>3</sup> Ci	2.74 E + 01 7.13 E + 02	± 1.0 E + 00 ± 5.0 E + 00
b. Dry compressible waste, contaminated equip., etc.	m <sup>3</sup> Ci	2.04 E + 01 1.43 E + 00	± 1.0 E + 00 ± 5.0 E + 00
c. Irradiated components, control rods, etc.	m <sup>3</sup> Ci	0.00 E + 00 0.00 E + 00	N/A N/A
d. Other (describe)	m <sup>3</sup> Ci	0.00 E + 00 0.00 E + 00	N/A N/A

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

a. Iron-55	%	4.26 E + 01
Nickel-63	%	4.00 E + 01
Cobalt-60	%	1.58 E + 01
b. Iron-55	%	5.77 E + 01
Cobalt-60	%	1.25 E + 01
Cobalt-58	%	9.15 E + 00
Nickel-63	%	9.08 E + 00
Chromium-51	%	6.24 E + 00
Niobium-95	%	1.50 E + 00
Manganese-54	%	1.29 E + 00
Hydrogen-3 (Tritium)	%	1.03 E + 00
c. N/A	%	
d. N/A	%	

# SOLID WASTE AND IRRADIATED FUEL SHIPMENTS (Cont'd.)

## 3. Solid Waste Disposition:

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
8	Truck	Scientific Ecology Group, Inc. 1560 Bear Creek Road Oak Ridge, TN
6	Truck	Chem-Nuclear Systems Barnwell Waste Management Facility Osborne Road Barnwell, S.C.

## 4. Class of Solid Waste:

A, B

## 5. Type of Containers Used for Shipment:

Strong, Tight, High-Integrity Containers, Types A and B casks

## 6. Solidification Agent:

N/A

## B. IRRADIATED FUEL SHIPMENTS (Disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
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----- No shipments made during this period -----

**DOSE ACCUMULATIONS FOR 1995**

SITE:South Texas Project Electric Generating Station

UNIT:1

YEAR:1995

SUMMARY OF MAXIMUM INDIVIDUAL DOSES

TOTAL ACCUMULATION FOR PERIODS:

LIQUID: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

GASEOUS: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

AIR: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST DIR (M) (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MR)
LIQUID	TOTAL BODY	1.45E-02	ADULT	RECEPTOR 3 <sup>(5)</sup>	4.8E-01	3.0
LIQUID	GI-TRACT	1.53E-02	ADULT	RECEPTOR 3 <sup>(5)</sup>	1.5E-01	10.0
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	7.60E-04		1850. WNW	7.6E-03	10.0
NOBLE GAS	AIR DOSE (BETA-MRAD)	7.13E-04		1850. WNW	3.6E-03	20.0
NOBLE GAS	TOTAL BODY	2.79E-04	ALL <sup>(1)</sup>	1850. WNW	5.6E-03	5.0
NOBLE GAS	TOTAL BODY	1.10E-04	ALL <sup>(2)</sup>	4000. WSW	2.2E-03	5.0
NOBLE GAS	SKIN	5.27E-04	ALL <sup>(1)</sup>	1850. WNW	3.5E-03	15.0
NOBLE GAS	SKIN	2.07E-04	ALL <sup>(2)</sup>	4000. WSW	1.4E-03	15.0
IODINE+ PARTICULATES	THYROID	2.43E-02	CHILD <sup>(1)</sup>	1850. WNW	1.6E-01	15.0
IODINE+ PARTICULATES	THYROID	5.49E-03	CHILD <sup>(2)</sup>	4000. WSW	3.7E-02	15.0

SUMMARY OF POPULATION DOSES

TOTAL ACCUMULATION FOR PERIODS:

LIQUID: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

GASEOUS: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

EFFLUENT	APPLICABLE ORGAN	ESTIMATED POPULATION DOSE (PERSON-REM)	AVERAGE DOSE TO POPULATION (REM/PERSON)
LIQUID	TOTAL BODY	4.7E-03	2.29E-07 <sup>(3)</sup>
GASEOUS	TOTAL BODY	2.1E-02	7.09E-08 <sup>(4)</sup>

<sup>(1)</sup> Doses were calculated for HYPOTHETICAL receptors at the site boundary.

<sup>(2)</sup> Highest dose for REAL individual or receptor.

<sup>(3)</sup> Calculation based on a population of 152,000 for shore line exposure, 303,000 for salt water invertebrate ingestion and 3,300 for salt water sport fish ingestion.

<sup>(4)</sup> Calculation based on a population of 299,000 within fifty (50) miles of South Texas Project Electric Generating Station.

<sup>(5)</sup> Receptor 3 is an individual ingesting fresh water sport fish and receiving shoreline exposure from the Little Robbins Slough Area.

SITE:South Texas Project Electric Generating Station

UNIT:2 YEAR:1995

SUMMARY OF MAXIMUM INDIVIDUAL DOSES

TOTAL ACCUMULATION FOR PERIODS:

LIQUID: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

GASEOUS: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

AIR: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST DIR (M) (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MR)
LIQUID	TOTAL BODY	7.04E-03	ADULT	RECEPTOR 3 <sup>(5)</sup>	2.3E-01	3.0
LIQUID	GI-TRACT	7.74E-03	ADULT	RECEPTOR 3 <sup>(5)</sup>	7.7E-02	10.0
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	9.39E-04		1540. NNW	9.4E-03	10.0
NOBLE GAS	AIR DOSE (BETA-MRAD)	1.18E-03		1720. NW	5.9E-03	20.0
NOBLE GAS	TOTAL BODY	3.56E-04	ALL <sup>(1)</sup>	1540. NNW	7.1E-03	5.0
NOBLE GAS	TOTAL BODY	5.38E-05	ALL <sup>(2)</sup>	4000. WSW	1.1E-03	5.0
NOBLE GAS	SKIN	7.00E-04	ALL <sup>(1)</sup>	1540. NNW	4.7E-03	15.0
NOBLE GAS	SKIN	1.23E-04	ALL <sup>(2)</sup>	4000. WSW	8.2E-04	15.0
IODINE+ PARTICULATES	THYROID	3.72E-03	CHILD <sup>(1)</sup>	1720. NW	2.5E-02	15.0
IODINE+ PARTICULATES	THYROID	6.88E-04	CHILD <sup>(2)</sup>	4000. WSW	4.6E-03	15.0

SUMMARY OF POPULATION DOSES

TOTAL ACCUMULATION FOR PERIODS:

LIQUID: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

GASEOUS: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

EFFLUENT	APPLICABLE ORGAN	ESTIMATED POPULATION DOSE (PERSON-REM)	AVERAGE DOSE TO POPULATION (REM/PERSON)
LIQUID	TOTAL BODY	3.0E-03	1.2E-07 <sup>(3)</sup>
GASEOUS	TOTAL BODY	3.0E-03	1.0E-08 <sup>(4)</sup>

<sup>(1)</sup> Doses were calculated for HYPOTHETICAL receptors at the site boundary.

<sup>(2)</sup> Highest dose for REAL individual or receptor.

<sup>(3)</sup> Calculation based on a population of 152,000 for shore line exposure, 303,000 for salt water invertebrate ingestion and 3,300 for salt water sport fish ingestion.

<sup>(4)</sup> Calculation based on a population of 299,000 within fifty (50) miles of South Texas Project Electric Generating Station.

<sup>(5)</sup> Receptor 3 is an individual ingesting fresh water sport fish and receiving shoreline exposure from the Little Robbins Slough Area.



SITE:South Texas Project Electric Generating Station

UNIT:1 PLUS 2

YEAR:1995

SUMMARY OF MAXIMUM INDIVIDUAL DOSES

TOTAL ACCUMULATION FOR PERIODS:

LIQUID: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

GASEOUS: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

AIR: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

EFFLUENT	APPLICABLE ORGAN	UNIT 1 ESTIMATED DOSE (MREM)	UNIT 2 ESTIMATED DOSE (MREM)	TOTAL 1+2 ESTIMATED DOSE (MREM)	AGE GROUP (M)	LOCATION DIST DIR (TOWARD)
LIQUID	TOTAL BODY	1.45E-02	7.04E-03	2.16E-02	ADULT	RECEPTOR 3 <sup>(5)</sup>
LIQUID	GI TRACT	1.53E-02	7.74E-03	2.30E-02	ADULT	RECEPTOR 3 <sup>(5)</sup>
NOBLE GAS	AIR DOSE	7.60E-04	6.43E-04	1.40E-03		1850. WNW
	(GAMMA-MRAD)					
NOBLE GAS	AIR DOSE	7.13E-04	1.14E-03	1.85E-03		1850. WNW
	(BETA-MRAD)					
NOBLE GAS	TOTAL BODY	1.57E-04	3.56E-04	5.13E-04	ALL <sup>(1)</sup>	1540. NNW
NOBLE GAS	TOTAL BODY	1.10E-04	5.38E-05	1.64E-04	ALL <sup>(2)</sup>	4000. WSW
NOBLE GAS	SKIN	5.27E-04	5.14E-04	1.04E-03	ALL <sup>(1)</sup>	1850. WNW
NOBLE GAS	SKIN	2.07E-04	1.23E-04	3.30E-04	ALL <sup>(2)</sup>	4000. WSW
IODINE+	THYROID	2.43E-02	3.15E-03	2.74E-02	CHILD <sup>(1)</sup>	1850. WNW
PARTICULATES						
IODINE+	THYROID	5.49E-03	6.88E-04	6.18E-03	CHILD <sup>(2)</sup>	4000. WSW
PARTICULATES						
IODINE+	TOTAL BODY	4.22E-03	5.22E-04	4.74E-03	ADULT <sup>(2)</sup>	4000. WSW
PARTICULATES						

SUMMARY OF POPULATION DOSES

TOTAL ACCUMULATION FOR PERIODS:

LIQUID: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

GASEOUS: FROM 1/ 1/95 0:00 TO 12/31/95 23:00

EFFLUENT	APPLICABLE ORGAN	TOTAL 1+2 ESTIMATED POPULATION DOSE (PERSON-REM)	TOTAL 1+2 AVERAGE DOSE TO POPULATION REM/PERSON)
LIQUID	TOTAL BODY	7.8E-03	3.5E-07 <sup>(3)</sup>
GASEOUS	TOTAL BODY	2.4E-02	8.1E-08 <sup>(4)</sup>

<sup>(1)</sup> Doses were calculated for HYPOTHETICAL receptors at the site boundary.

<sup>(2)</sup> Highest dose for REAL individual or receptor.

<sup>(3)</sup> Calculation based on a population of 152,000 for shore line exposure, 303,000 for salt water invertebrate ingestion and 3,300 for salt water sport fish ingestion.

<sup>(4)</sup> Calculation based on a population of 299,000 within fifty (50) miles of South Texas Project Electric Generating Station.

<sup>(5)</sup> Receptor 3 is an individual ingesting fresh water sport fish and receiving shoreline exposure from the Little Robbins Slough Area.

**JOINT FREQUENCY TABLES FOR 1995**

**First Quarter**

# JOINT FREQUENCY TABLE

STABILITY CLASS -A-

FROM 1/ 1/95 0:00 TO 3/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	3	0	0	3	8.6	22.6
SSE	0	0	0	0	3	0	0	0	3	8.6	15.6
S	0	0	0	3	9	0	0	0	12	34.3	13.7
SSW	0	0	0	2	11	0	0	0	13	37.1	13.6
SW	0	0	0	0	3	0	0	0	3	8.6	17.3
WSW	0	0	0	1	0	0	0	0	1	2.9	10.5
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	0	6	26	3	0	0	35	100.0	
%	0.0	0.0	0.0	17.1	74.3	8.6	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 14.8 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRFCTION= 0

TOTAL NUMBER OF CALMS= 2

TOTAL NUMBER OF INVALID HOURS= 97

TOTAL NUMBER OF VALID HCURS= 2063

TOTAL NUMBER OF HOURS FOR PERIOD= 2160

JOINT FREQUENCY TABLE

STABILITY CLASS -B-

FROM 1/ 1/95 0:00 TO 3/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	2	0	0	2	6.9	21.3
SSE	0	0	0	0	2	0	0	0	2	6.9	15.3
S	0	0	0	7	2	0	0	0	9	31.0	12.0
SSW	0	0	0	5	1	0	0	0	6	20.7	11.7
SW	0	0	0	6	1	0	0	0	7	24.1	11.5
WSW	0	0	0	1	0	0	0	0	1	3.4	12.1
W	0	0	0	2	0	0	0	0	2	6.9	9.7
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	0	21	6	2	0	0	29	100.0	
%	0.0	0.0	0.0	72.4	20.7	6.9	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 12.5 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 2

TOTAL NUMBER OF INVALID HOURS= 97

TOTAL NUMBER OF VALID HOURS= 2063

TOTAL NUMBER OF HOURS FOR PERIOD= 2160

## JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 1/ 1/95 0:00 TO 3/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	1	0	0	0	0	1	2.4	11.3
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	2	0	0	0	2	4.9	13.4
SE	0	0	0	1	1	1	0	0	3	7.3	16.2
SSE	0	0	0	1	3	2	0	0	6	14.6	16.8
S	0	0	0	8	2	0	0	0	10	24.4	11.7
SSW	0	0	0	2	0	0	0	0	2	4.9	10.1
SW	0	0	1	3	1	0	0	0	5	12.2	9.6
WSW	0	0	0	1	0	0	0	0	1	2.4	9.6
W	0	0	0	1	0	0	0	0	1	2.4	8.2
WNW	0	0	1	0	0	2	0	0	3	7.3	16.1
NW	0	0	2	1	0	0	2	0	5	12.2	14.2
NNW	0	0	2	0	0	0	0	0	2	4.9	6.3
TOTAL	0	0	6	19	9	5	2	0	41	100.0	
%	0.0	0.0	14.6	46.3	22.0	12.2	4.9	0.0	100.0		

AVE SPEED FOR THIS TABLE= 12.7 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 2

TOTAL NUMBER OF INVALID HOURS= 97

TOTAL NUMBER OF VALID HOURS= 2063

TOTAL NUMBER OF HOURS FOR PERIOD= 2160

## JOINT FREQUENCY TABLE

STABILITY CLASS -D-

FROM 1/ 1/95 0:00 TO 3/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	2	13	65	59	3	0	0	142	16.1	12.3
NNE	0	0	17	91	38	0	0	0	146	16.6	10.8
NE	0	1	8	39	21	3	0	0	72	8.2	11.7
ENE	0	1	7	13	19	2	0	0	42	4.8	11.9
E	0	0	6	10	13	0	0	0	29	3.3	11.5
ESE	0	1	6	18	28	0	0	0	53	6.0	12.3
SE	0	0	2	30	30	4	0	0	66	7.5	13.0
SSE	0	0	6	12	17	3	0	0	38	4.3	13.0
S	0	0	6	29	6	0	0	0	41	4.7	9.7
SSW	0	0	3	15	0	0	0	0	18	2.0	9.2
SW	0	0	6	7	5	0	0	0	18	2.0	9.7
WSW	0	0	3	2	1	0	0	0	6	0.7	8.5
W	0	1	3	11	1	0	0	0	16	1.8	9.2
WNW	0	0	8	10	0	1	0	0	19	2.2	8.5
NW	0	0	12	23	8	10	1	0	54	6.1	12.5
NNW	0	1	14	33	55	12	5	0	120	13.6	13.5
TOTAL	0	7	120	408	301	38	6	0	880	100.0	
%	0.0	0.8	13.6	46.4	34.2	4.3	0.7	0.0	100.0		

AVE SPEED FOR THIS TABLE= 11.8 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 2

TOTAL NUMBER OF INVALID HOURS= 97

TOTAL NUMBER OF VALID HOURS= 2063

TOTAL NUMBER OF HOURS FOR PERIOD= 2160



JOINT FREQUENCY TABLE

STABILITY CLASS -E-

FROM 1/ 1/95 0:00 TO 3/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	20	18	2	0	0	0	40	6.0	7.8
NNE	0	4	14	17	3	0	0	0	38	5.7	7.9
NE	0	1	12	20	2	0	0	0	35	5.3	8.5
ENE	0	3	12	15	4	0	0	0	34	5.1	8.3
E	0	2	20	22	6	0	0	0	50	7.5	8.7
ESE	0	3	24	19	14	2	0	0	62	9.3	9.5
SE	0	2	17	24	15	1	0	0	59	8.9	9.9
SSE	0	2	19	65	12	0	0	0	98	14.7	9.6
S	0	1	35	52	2	0	0	0	90	13.5	8.3
SSW	0	0	12	25	6	0	0	0	43	6.5	9.2
SW	0	1	4	14	0	0	0	0	19	2.9	8.8
WSW	0	1	2	2	1	0	0	0	6	0.9	7.9
W	0	1	3	2	1	0	0	0	7	1.1	7.3
WNW	0	1	5	1	0	0	0	0	7	1.1	5.6
NW	0	1	13	9	4	0	0	0	27	4.1	8.7
NNW	0	1	21	12	10	6	0	0	50	7.5	10.7
TOTAL	0	24	233	317	82	9	0	0	665	100.0	
%	0.0	3.6	35.0	47.7	12.3	1.4	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.0 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 2

TOTAL NUMBER OF INVALID HOURS= 97

TOTAL NUMBER OF VALID HOURS= 2063

TOTAL NUMBER OF HOURS FOR PERIOD= 2160

JOINT FREQUENCY TABLE

STABILITY CLASS -F-  
FROM 1/ 1/95 0:00 TO 3/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	2	12	3	0	0	0	0	17	8.2	5.7
NNE	0	0	5	3	0	0	0	0	8	3.8	7.0
NE	0	2	6	6	0	0	0	0	14	6.7	6.4
ENE	0	3	6	1	0	0	0	0	10	4.8	4.8
E	0	7	18	0	0	0	0	0	25	12.0	4.6
ESE	0	2	19	2	0	0	0	0	23	11.1	6.0
SE	0	2	8	1	0	0	0	0	11	5.3	5.2
SSE	0	0	9	0	0	0	0	0	9	4.3	4.9
S	0	0	8	9	0	0	0	0	17	8.2	6.9
SSW	0	2	2	3	0	0	0	0	7	3.4	6.8
SW	0	1	2	4	0	0	0	0	7	3.4	8.7
WSW	0	0	3	2	0	0	0	0	5	2.4	7.2
W	0	1	4	2	0	0	0	0	7	3.4	6.1
WNW	0	3	7	3	0	0	0	0	13	6.3	5.7
NW	0	1	14	4	0	0	0	0	19	9.1	5.7
NNW	0	3	7	6	0	0	0	0	16	7.7	6.9
TOTAL	0	29	130	49	0	0	0	0	208	100.0	
%	0.0	13.9	62.5	23.6	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 6.0 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 2

TOTAL NUMBER OF INVALID HOURS= 97

TOTAL NUMBER OF VALID HOURS= 2063

TOTAL NUMBER OF HOURS FOR PERIOD= 2160

## JOINT FREQUENCY TABLE

STABILITY CLASS -G-

FROM 1/ 1/95 0:00 TO 3/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 - 12.5 -	12.6 - 18.5 -	18.6 - 24.5 -	24.6 - 32.5 -	32.6+	TOTAL	%	AVE SPEED
N	1	5	3	0	0	0	0	0	9	4.4	3.8
NNE	0	6	6	2	0	0	0	0	14	6.8	4.7
NE	0	9	9	1	0	0	0	0	19	9.3	4.0
ENE	0	7	8	0	0	0	0	0	15	7.3	3.2
E	0	10	5	0	0	0	0	0	15	7.3	3.1
ESE	1	9	5	0	0	0	0	0	15	7.3	3.3
SE	0	8	5	1	0	0	0	0	14	6.8	3.7
SSE	0	5	3	0	0	0	0	0	8	3.9	3.5
S	0	1	7	0	0	0	0	0	8	3.9	5.1
SSW	0	0	2	0	0	0	0	0	2	1.0	5.3
SW	0	1	0	0	0	0	0	0	1	0.5	1.8
WSW	0	0	2	0	0	0	0	0	2	1.0	4.7
W	0	2	12	1	0	0	0	0	15	7.3	5.7
WNW	0	7	17	7	0	0	0	0	31	15.1	5.4
NW	0	3	19	1	0	0	0	0	23	11.2	5.6
NNW	0	6	8	0	0	0	0	0	14	6.8	4.0
TOTAL	2	79	111	13	0	0	0	0	205	100.0	
%	1.0	38.5	54.1	6.3	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 4.4 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 2

TOTAL NUMBER OF INVALID HOURS= 97

TOTAL NUMBER OF VALID HOURS= 2063

TOTAL NUMBER OF HOURS FOR PERIOD= 2160

# JOINT FREQUENCY TABLE

ALL CLASSES COMBINED

FROM 1/ 1/95 0:00 TO 3/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	1	9	48	87	61	3	0	0	209	10.1	10.5
NNE	0	10	42	113	41	0	0	0	206	10.0	9.7
NE	0	13	35	66	23	3	0	0	140	6.8	9.3
ENE	0	14	33	29	23	2	0	0	101	4.9	8.7
E	0	19	49	32	19	0	0	0	119	5.8	7.8
ESE	1	15	54	39	44	2	0	0	155	7.5	9.4
SE	0	12	32	57	46	11	0	0	158	7.7	10.9
SSE	0	7	37	78	37	5	0	0	164	7.9	10.3
S	0	2	56	108	21	0	0	0	187	9.1	9.1
SSW	0	2	19	52	18	0	0	0	91	4.4	9.8
SW	0	3	13	34	10	0	0	0	60	2.9	9.8
WSW	0	1	10	9	2	0	0	0	22	1.1	8.0
W	0	5	22	19	2	0	0	0	48	2.3	7.4
WNW	0	11	38	21	0	3	0	0	73	3.5	6.7
NW	0	5	60	38	12	10	3	0	128	6.2	9.5
NNW	0	11	52	51	65	18	5	0	202	9.8	11.6
TOTAL	2	139	600	833	424	57	8	0	2063	100.0	
%	0.1	6.7	29.1	40.4	20.6	2.8	0.4	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.7 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 2

TOTAL NUMBER OF INVALID HOURS= 97

TOTAL NUMBER OF VALID HOURS= 2063

TOTAL NUMBER OF HOURS FOR PERIOD= 2160

**JOINT FREQUENCY TABLES FOR 1995**

**Second Quarter**

## JOINT FREQUENCY TABLE

STABILITY CLASS -A-

FROM 4/ 1/95 0:00 TO 6/30/95 23:00

## PRIMARY TOWER

## WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	1	0	0	0	0	0	1	2.4	5.1
NNE	0	0	1	0	0	0	0	0	1	2.4	4.4
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	1	1	0	0	0	0	2	4.8	6.8
SE	0	0	0	0	2	1	0	0	3	7.1	17.7
SSE	0	0	0	0	12	1	0	0	13	31.0	16.8
S	0	0	0	2	20	0	0	0	22	52.4	14.6
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	3	3	34	2	0	0	42	100.0	
%	0.0	0.0	7.1	7.1	81.0	4.8	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 14.7 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 9

TOTAL NUMBER OF VALID HOURS= 2175

TOTAL NUMBER OF HOURS FOR PERIOD= 2184



## JOINT FREQUENCY TABLE

STABILITY CLASS -B-

FROM 4/ 1/95 0:00 TO 6/30/95 23:00

## PRIMARY TOWER

## WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	1	0	0	0	0	0	1	2.6	6.6
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	5	0	0	0	5	13.2	15.7
SE	0	0	0	1	2	0	0	0	3	7.9	15.4
SSE	0	0	0	1	7	5	0	0	13	34.2	16.2
S	0	0	0	8	7	0	0	0	15	39.5	12.8
SSW	0	0	0	0	1	0	0	0	1	2.6	17.1
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	1	10	22	5	0	0	38	100.0	
%	0.0	0.0	2.6	26.3	57.9	13.2	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 14.5 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 9

TOTAL NUMBER OF VALID HOURS= 2175

TOTAL NUMBER OF HOURS FOR PERIOD= 2184

## JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 4/ 1/95 0:00 TO 6/30/95 23:00

## PRIMARY TOWER

## WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	1	0	0	0	0	1	1.4	7.6
NNE	0	0	0	1	1	0	0	0	2	2.8	12.0
NE	0	0	0	1	0	0	0	0	1	1.4	12.2
ENE	0	0	1	4	0	0	0	0	5	6.9	9.0
E	0	0	0	1	0	0	0	0	1	1.4	9.0
ESE	0	0	0	0	5	0	0	0	5	6.9	14.5
SE	0	0	0	3	9	0	0	0	12	16.7	14.2
SSE	0	0	0	9	13	2	0	0	24	33.3	13.8
S	0	0	0	7	8	0	0	0	15	20.8	12.5
SSW	0	0	0	1	0	0	0	0	1	1.4	7.8
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	4	1	0	0	5	6.9	16.8
TOTAL	0	0	1	28	40	3	0	0	72	100.0	
%	0.0	0.0	1.4	38.9	55.6	4.2	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 13.2 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 9

TOTAL NUMBER OF VALID HOURS= 2175

TOTAL NUMBER OF HOURS FOR PERIOD= 2184

## JOINT FREQUENCY TABLE

STABILITY CLASS -D-

FROM 4/ 1/95 0:00 TO 6/30/95 23:00

## PRIMARY TOWER

## WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	7	25	10	1	0	0	43	4.4	10.9
NNE	0	1	12	26	6	0	0	0	45	4.6	9.4
NE	0	2	15	26	2	0	0	0	45	4.6	8.5
ENE	0	0	6	13	1	0	0	0	20	2.1	8.8
E	0	1	7	21	8	3	0	0	40	4.1	10.7
ESE	0	1	11	57	55	0	0	0	124	12.8	11.6
SE	0	0	14	130	147	12	0	0	303	31.2	12.9
SSE	0	1	12	67	73	4	0	0	157	16.2	12.3
S	0	1	23	39	20	0	0	0	83	8.5	9.9
SSW	0	2	13	7	2	0	0	0	24	2.5	7.1
SW	0	0	2	2	1	0	0	0	5	0.5	8.6
WSW	0	1	1	0	0	0	0	0	2	0.2	4.8
W	0	0	7	0	0	0	0	0	7	0.7	6.1
WNW	0	1	7	0	0	0	0	0	8	0.8	5.6
NW	0	4	8	1	0	0	0	0	13	1.3	4.5
NNW	0	0	14	10	21	7	0	0	52	5.4	13.0
TOTAL	0	15	159	424	346	27	0	0	971	100.0	
%	0.0	1.5	16.4	43.7	35.6	2.8	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 11.4 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 9

TOTAL NUMBER OF VALID HOURS= 2175

TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLE

STABILITY CLASS -E-

FROM 4/ 1/95 0:00 TO 6/30/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	2	20	12	1	1	0	0	36	5.5	7.6
NNE	0	2	16	12	0	1	0	0	31	4.8	7.2
NE	0	1	18	2	1	0	0	0	22	3.4	6.1
ENE	0	6	13	6	2	4	0	0	31	4.8	8.2
E	0	3	15	13	4	0	1	0	36	5.5	8.6
ESE	0	5	33	38	6	0	0	0	82	12.6	8.1
SE	0	3	37	94	24	0	0	0	158	24.3	9.5
SSE	0	1	37	99	17	0	0	0	154	23.7	9.5
S	0	0	20	12	7	0	0	0	39	6.0	8.6
SSW	0	0	9	4	3	0	0	0	16	2.5	8.8
SW	0	2	3	5	0	0	0	0	10	1.5	7.4
WSW	0	0	1	0	0	0	0	0	1	0.2	7.3
W	0	0	3	1	0	0	0	0	4	0.6	5.4
WNW	0	0	1	0	0	0	0	0	1	0.2	4.5
NW	0	2	1	0	0	0	0	0	3	0.5	4.2
NNW	0	1	13	5	4	2	0	0	25	3.9	9.3
TOTAL	0	28	240	303	69	8	1	0	649	100.0	
%	0.0	4.3	37.0	46.7	10.6	1.2	0.2	0.0	100.0		

AVE SPEED FOR THIS TABLE= 8.7 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 9

TOTAL NUMBER OF VALID HOURS= 2175

TOTAL NUMBER OF HOURS FOR PERIOD= 2184

## JOINT FREQUENCY TABLE

STABILITY CLASS -F-

FROM 4/ 1/95 0:00 TO 6/30/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	4	8	2	0	0	0	0	14	7.7	4.6
NNE	0	8	10	0	0	0	0	0	18	9.8	4.4
NE	0	4	21	0	0	0	0	0	25	13.7	4.9
ENE	0	3	14	1	0	0	0	0	18	9.8	4.6
E	0	4	10	3	0	0	0	0	17	9.3	4.9
ESE	0	5	34	1	0	0	0	0	40	21.9	4.6
SE	0	3	19	0	0	0	0	0	22	12.0	4.9
SSE	0	1	5	0	0	0	0	0	6	3.3	5.1
S	0	0	3	0	0	0	0	0	3	1.6	5.8
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	3	0	0	0	0	0	3	1.6	5.2
WSW	0	0	1	0	0	0	0	0	1	0.5	5.7
W	0	1	2	0	0	0	0	0	3	1.6	4.4
WNW	0	1	1	0	0	0	0	0	2	1.1	4.0
NW	0	0	4	0	0	0	0	0	4	2.2	4.5
NNW	0	1	4	1	0	1	0	0	7	3.8	7.3
TOTAL	0	35	139	8	0	1	0	0	183	100.0	
%	0.0	19.1	76.0	4.4	0.0	0.5	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 4.8 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 9

TOTAL NUMBER OF VALID HOURS= 2175

TOTAL NUMBER OF HOURS FOR PERIOD= 2184

# JOINT FREQUENCY TABLE

STABILITY CLASS -G-

FROM 4/ 1/95 0:00 TO 6/30/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	5	6	0	0	0	0	0	11	5.0	4.3
NNE	0	10	14	0	0	0	0	0	24	10.9	4.4
NE	0	13	18	2	0	0	0	0	33	15.0	4.1
ENE	0	20	17	1	0	0	0	0	38	17.3	3.5
E	0	12	19	0	0	0	0	0	31	14.1	3.9
ESE	0	21	6	0	0	0	0	0	27	12.3	3.2
SE	0	13	10	0	0	0	0	0	23	10.5	3.7
SSE	0	2	0	0	0	0	0	0	2	0.9	2.6
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	6	0	0	0	0	0	6	2.7	4.2
WNW	0	2	5	0	0	0	0	0	7	3.2	4.1
NW	0	7	3	0	0	0	0	0	10	4.5	3.2
NNW	0	4	4	0	0	0	0	0	8	3.6	3.4
TOTAL	0	109	108	3	0	0	0	0	220	100.0	
%	0.0	49.5	49.1	1.4	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 3.8 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 9

TOTAL NUMBER OF VALID HOURS= 2175

TOTAL NUMBER OF HOURS FOR PERIOD= 2184



## JOINT FREQUENCY TABLE

ALL CLASSES COMBINED

FROM 4/ 1/95 0:00 TO 6/30/95 23:00

## PRIMARY TOWER

## WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	11	42	40	11	2	0	0	106	4.9	8.1
NNE	0	21	53	39	7	1	0	0	121	5.6	7.1
NE	0	20	73	31	3	0	0	0	127	5.8	6.3
ENE	0	29	51	25	3	4	0	0	112	5.1	6.2
E	0	20	51	38	12	3	1	0	125	5.7	7.6
ESE	0	32	85	97	71	0	0	0	285	13.1	8.9
SE	0	19	80	228	184	13	0	0	524	24.1	11.2
SSE	0	5	54	176	122	12	0	0	369	17.0	11.3
S	0	1	46	68	62	0	0	0	177	8.1	10.6
SSW	0	2	22	12	6	0	0	0	42	1.9	8.0
SW	0	2	8	7	1	0	0	0	18	0.8	7.4
WSW	0	1	3	0	0	0	0	0	4	0.2	5.7
W	0	1	18	1	0	0	0	0	20	0.9	5.1
WNW	0	4	14	0	0	0	0	0	18	0.8	4.7
NW	0	13	16	1	0	0	0	0	30	1.4	4.0
NNW	0	6	35	16	29	11	0	0	97	4.5	11.0
TOTAL	0	187	651	779	511	46	1	0	2175	100.0	
%	0.0	8.6	29.9	35.8	23.5	2.1	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.4 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 9

TOTAL NUMBER OF VALID HOURS= 2175

TOTAL NUMBER OF HOURS FOR PERIOD= 2184

**JOINT FREQUENCY TABLES FOR 1995**

**Third Quarter**

# JOINT FREQUENCY TABLE

STABILITY CLASS -A-  
FROM 7/ 1/95 0:00 TO 9/30/95 23:00

## PRIMARY TOWER

### WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	3	0	0	0	0	3	2.8	10.0
NNE	0	0	0	4	0	0	0	0	4	3.7	10.4
NE	0	0	0	3	0	0	0	0	3	2.8	10.9
ENE	0	0	0	2	1	0	0	0	3	2.8	12.0
E	0	0	0	0	9	0	0	0	9	8.3	15.1
ESE	0	0	1	4	3	0	0	0	8	7.3	10.7
SE	0	0	0	8	1	0	0	0	9	8.3	10.4
SSE	0	0	0	6	0	0	0	0	6	5.5	9.2
S	0	0	1	27	21	0	0	0	49	45.0	11.9
SSW	0	0	2	11	1	0	0	0	14	12.8	9.8
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	1	0	0	0	0	1	0.9	7.9
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	4	69	36	0	0	0	109	100.0	
%	0.0	0.0	3.7	63.3	33.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 11.3 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 0  
TOTAL NUMBER OF INVALID HOURS= 42  
TOTAL NUMBER OF VALID HOURS= 2166  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208

# JOINT FREQUENCY TABLE

STABILITY CLASS -B-

FROM 7/ 1/95 0:00 TO 9/30/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	1	0	0	0	0	1	0.9	9.0
NNE	0	0	1	3	0	0	0	0	4	3.5	8.9
NE	0	0	4	7	0	0	0	0	11	9.6	8.2
ENE	0	0	1	1	0	0	0	0	2	1.8	9.4
E	0	0	2	1	4	0	0	0	7	6.1	11.5
ESE	0	0	2	12	0	0	0	0	14	12.3	10.1
SE	0	0	7	15	0	0	0	0	22	19.3	8.8
SSE	0	0	1	8	1	0	0	0	10	8.8	9.7
S	0	0	2	21	4	0	0	0	27	23.7	10.6
SSW	0	0	3	8	0	0	0	0	11	9.6	9.7
SW	0	0	0	1	0	0	0	0	1	0.9	9.7
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	1	0	0	0	0	0	1	0.9	4.7
NW	0	0	2	0	0	0	0	0	2	1.8	5.7
NNW	0	0	0	1	0	0	0	0	1	0.9	8.2
TOTAL	0	0	26	79	9	0	0	0	114	100.0	
%	0.0	0.0	22.8	69.3	7.9	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.6 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 42

TOTAL NUMBER OF VALID HOURS= 2166

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

# JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 7/ 1/95 0:00 TO 9/30/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	1	5	1	3	0	0	0	10	5.8	9.0
NNE	0	0	6	2	1	0	0	0	9	5.3	7.6
NE	0	0	6	5	0	0	0	0	11	6.4	6.8
ENE	0	1	10	3	1	0	0	0	15	8.8	6.8
E	0	2	11	3	1	0	0	0	17	9.9	6.6
ESE	0	1	4	10	3	0	0	0	18	10.5	9.3
SE	0	0	6	13	1	0	0	0	20	11.7	8.7
SSE	0	0	5	7	2	0	0	0	14	8.2	8.5
S	0	0	4	14	5	0	0	0	23	13.5	10.1
SSW	0	0	4	9	0	0	0	0	13	7.6	8.6
SW	0	0	4	3	0	0	0	0	7	4.1	7.3
WSW	0	0	0	1	0	0	0	0	1	0.6	9.2
W	0	0	2	0	0	0	0	0	2	1.2	4.8
WNW	0	0	1	0	0	0	0	0	1	0.6	4.5
NW	0	0	6	0	0	0	0	0	6	3.5	4.8
NNW	0	1	3	0	0	0	0	0	4	2.3	4.2
TOTAL	0	6	77	71	17	0	0	0	171	100.0	
%	0.0	3.5	45.0	41.5	9.9	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 8.0 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 42

TOTAL NUMBER OF VALID HOURS= 2166

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

## JOINT FREQUENCY TABLE

STABILITY CLASS -D-

FROM 7/ 1/95 0:00 TO 9/30/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	5	10	20	11	3	0	0	49	8.4	10.3
NNE	0	5	24	10	3	0	0	0	42	7.2	6.9
NE	0	1	24	5	0	0	0	0	30	5.2	6.0
ENE	0	3	11	2	1	0	0	0	17	2.9	6.0
E	0	2	19	11	4	0	0	0	36	6.2	7.5
ESE	0	1	17	32	6	0	0	0	56	9.7	8.9
SE	0	4	27	53	3	0	0	0	87	15.0	8.0
SSE	0	2	26	26	8	0	0	0	62	10.7	8.8
S	0	3	16	47	24	2	0	0	92	15.9	10.3
SSW	0	0	13	8	0	0	0	0	21	3.6	7.1
SW	0	1	4	4	0	0	0	0	9	1.6	7.4
WSW	0	3	4	9	0	0	0	0	16	2.8	7.6
W	0	2	11	1	0	0	0	0	14	2.4	5.5
WNW	0	1	5	1	0	0	0	0	7	1.2	5.2
NW	0	3	7	4	0	0	0	0	14	2.4	5.9
NNW	0	3	15	7	3	0	0	0	28	4.8	7.5
TOTAL	0	39	233	240	63	5	0	0	580	100.0	
%	0.0	6.7	40.2	41.4	10.9	0.9	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 8.2 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 42

TOTAL NUMBER OF VALID HOURS= 2166

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

## JOINT FREQUENCY TABLE

STABILITY CLASS -E-

FROM 7/ 1/95 0:00 TO 9/30/95 23:00

## PRIMARY TOWER

## WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	6	13	1	0	0	0	0	20	3.9	4.5
NNE	0	3	14	7	0	0	0	0	24	4.6	6.0
NE	0	2	15	1	0	0	0	0	18	3.5	5.3
ENE	0	6	15	0	0	0	0	0	21	4.0	4.6
E	0	4	21	4	0	0	0	0	29	5.6	5.3
ESE	0	3	30	5	0	0	0	0	38	7.3	5.5
SE	0	4	43	12	2	0	0	0	61	11.8	6.3
SSE	0	3	68	29	13	0	0	0	113	21.8	7.8
S	0	1	40	50	12	0	0	0	103	19.8	9.0
SSW	0	0	21	19	1	0	0	0	41	7.9	7.9
SW	0	0	7	7	0	0	0	0	14	2.7	7.9
WSW	0	1	4	2	0	0	0	0	7	1.3	5.9
W	0	0	3	2	0	0	0	0	5	1.0	6.5
WNW	0	2	1	0	0	0	0	0	3	0.6	3.3
NW	0	3	7	1	0	0	0	0	11	2.1	4.4
NNW	0	3	8	0	0	0	0	0	11	2.1	4.8
TOTAL	0	41	310	140	28	0	0	0	519	100.0	
%	0.0	7.9	59.7	27.0	5.4	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 6.9 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 42

TOTAL NUMBER OF VALID HOURS= 2166

TOTAL NUMBER OF HOURS FOR PERIOD= 2208



## JOINT FREQUENCY TABLE

STABILITY CLASS -F-

FROM 7/ 1/95 0:00 TO 9/30/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	18	5	0	0	0	0	0	23	6.1	2.8
NNE	0	18	19	4	0	0	0	0	41	10.8	4.3
NE	0	9	38	0	0	0	0	0	47	12.4	4.5
ENE	0	25	17	1	0	0	0	0	43	11.3	3.5
E	0	12	15	1	0	0	0	0	28	7.4	4.0
ESE	0	21	18	0	0	0	0	0	39	10.3	3.6
SE	0	18	46	0	1	0	0	0	65	17.1	4.3
SSE	0	5	23	0	0	0	0	0	28	7.4	4.6
S	0	3	2	0	0	0	0	0	5	1.3	3.2
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	2	0	0	0	0	0	2	0.5	4.4
W	0	2	1	0	0	0	0	0	3	0.8	3.0
WNW	0	3	11	0	0	0	0	0	14	3.7	4.2
NW	0	12	10	0	0	0	0	0	22	5.8	3.6
NNW	0	12	8	0	0	0	0	0	20	5.3	3.4
TOTAL	0	158	215	6	1	0	0	0	380	100.0	
%	0.0	41.6	56.6	1.6	0.3	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 3.9 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 42

TOTAL NUMBER OF VALID HOURS= 2166

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

# JOINT FREQUENCY TABLE

STABILITY CLASS -G-

FROM 7/ 1/95 0:00 TO 9/30/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	22	1	0	0	0	0	0	23	7.8	2.9
NNE	0	26	47	1	0	0	0	0	74	25.3	4.1
NE	0	34	32	0	0	0	0	0	66	22.5	3.5
ENE	0	34	22	0	0	0	0	0	56	19.1	3.4
E	0	22	5	0	0	0	0	0	27	9.2	3.0
ESE	0	10	3	0	0	0	0	0	13	4.4	2.9
SE	0	3	6	0	0	0	0	0	9	3.1	4.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	1	0	0	0	0	0	1	0.3	3.9
NW	0	5	3	0	0	0	0	0	8	2.7	3.2
NNW	0	15	1	0	0	0	0	0	16	5.5	2.7
TOTAL	0	171	121	1	0	0	0	0	293	100.0	
%	0.0	58.4	41.3	0.3	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 3.5 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 42

TOTAL NUMBER OF VALID HOURS= 2166

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

# JOINT FREQUENCY TABLE

ALL CLASSES COMBINED

FROM 7/ 1/95 0:00 TO 9/30/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	52	34	26	14	3	0	0	129	6.0	6.7
NNE	0	52	111	31	4	0	0	0	198	9.1	5.3
NE	0	46	119	21	0	0	0	0	186	8.6	5.0
ENE	0	69	76	9	3	0	0	0	157	7.2	4.4
E	0	42	73	20	18	0	0	0	153	7.1	6.2
ESE	0	36	75	63	12	0	0	0	186	8.6	6.9
SE	0	29	135	101	8	0	0	0	273	12.6	6.8
SSE	0	10	123	76	24	0	0	0	233	10.8	7.9
S	0	7	65	159	66	2	0	0	299	13.8	10.0
SSW	0	0	43	55	2	0	0	0	100	4.6	8.3
SW	0	1	15	15	0	0	0	0	31	1.4	7.7
WSW	0	4	10	13	0	0	0	0	27	1.2	7.0
W	0	4	17	3	0	0	0	0	24	1.1	5.3
WNW	0	6	20	1	0	0	0	0	27	1.2	4.4
NW	0	23	35	5	0	0	0	0	63	2.9	4.4
NNW	0	34	35	8	3	0	0	0	80	3.7	5.0
TOTAL	0	415	986	606	154	5	0	0	2166	100.0	
%	0.0	19.2	45.5	28.0	7.1	0.2	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 6.7 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 42

TOTAL NUMBER OF VALID HOURS= 2166

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

**JOINT FREQUENCY TABLES FOR 1995**

**Fourth Quarter**

## JOINT FREQUENCY TABLE

STABILITY CLASS -A-

FROM 10/ 1/95 0:00 TO 12/31/95 23:00

## PRIMARY TOWER

## WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	1	5	14	5	0	0	25	11.3	15.3
NNE	0	0	3	8	1	1	0	0	13	5.9	10.6
NE	0	0	1	8	2	0	0	0	11	5.0	11.4
ENE	0	0	1	9	4	0	0	0	14	6.3	10.6
E	0	0	1	2	5	0	0	0	8	3.6	12.1
ESE	0	0	1	7	2	0	0	0	10	4.5	11.1
SE	0	0	2	10	1	0	0	0	13	5.9	9.4
SSE	0	0	0	7	10	0	0	0	17	7.7	13.5
S	0	0	2	19	24	1	0	0	46	20.7	12.6
SSW	0	0	5	4	19	0	0	0	28	12.6	13.1
SW	0	0	0	5	9	1	0	0	15	6.8	13.6
WSW	0	0	0	2	0	0	0	0	2	0.9	10.4
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	1	6	0	0	0	0	7	3.2	9.8
NW	0	0	0	5	2	0	0	0	7	3.2	10.5
NNW	0	0	0	4	1	1	0	0	6	2.7	12.8
TOTAL	0	0	18	101	94	9	0	0	222	100.0	
%	0.0	0.0	8.1	45.5	42.3	4.1	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 12.4 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 107

TOTAL NUMBER OF VALID HOURS= 2101

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

# JOINT FREQUENCY TABLE

STABILITY CLASS -B-

FROM 10/ 1/95 0:00 TO 12/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	5	1	5	2	0	0	13	9.0	11.9
NNE	0	0	6	3	2	1	0	0	12	8.3	9.6
NE	0	0	4	6	0	0	0	0	10	6.9	8.8
ENE	0	0	1	10	3	0	0	0	14	9.7	11.4
E	0	0	4	10	1	0	0	0	15	10.3	9.1
ESE	0	0	1	8	3	0	0	0	12	8.3	10.7
SE	0	0	4	4	1	0	0	0	9	6.2	8.3
SSE	0	0	1	2	2	0	0	0	5	3.4	11.8
S	0	0	1	10	2	0	0	0	13	9.0	11.1
SSW	0	0	3	3	3	1	0	0	10	6.9	11.5
SW	0	0	1	1	1	0	0	0	3	2.1	9.4
WSW	0	0	1	0	1	0	0	0	2	1.4	11.4
W	0	0	1	1	0	0	0	0	2	1.4	7.9
WNW	0	0	2	2	1	0	0	0	5	3.4	10.0
NW	0	1	3	3	2	0	0	0	9	6.2	9.3
NNW	0	0	6	2	2	1	0	0	11	7.6	9.5
TOTAL	0	1	44	66	29	5	0	0	145	100.0	
%	0.0	0.7	30.3	45.5	20.0	3.4	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 10.2 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 107

TOTAL NUMBER OF VALID HOURS= 2101

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

# JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 10/ 1/95 0:00 TO 12/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	3	1	6	3	0	0	13	10.8	14.4
NNE	0	0	4	5	2	0	0	0	11	9.2	9.3
NE	0	0	3	8	4	0	0	0	15	12.5	10.0
ENE	0	0	2	8	1	2	0	0	13	10.8	11.1
E	0	0	2	6	3	0	0	0	11	9.2	10.5
ESE	0	0	3	1	1	0	0	0	5	4.2	7.7
SE	0	0	1	4	3	0	0	0	8	6.7	11.0
SSE	0	0	1	3	4	0	0	0	8	6.7	11.7
S	0	0	2	9	1	0	0	0	12	10.0	10.3
SSW	0	0	1	0	2	0	0	0	3	2.5	12.2
SW	0	0	2	2	0	0	0	0	4	3.3	8.6
WSW	0	0	1	0	0	0	0	0	1	0.8	6.1
W	0	0	0	1	0	0	0	0	1	0.8	9.6
WNW	0	0	1	0	0	0	0	0	1	0.8	5.0
NW	0	0	3	0	3	0	0	0	6	5.0	11.2
NNW	0	0	3	2	2	1	0	0	8	6.7	10.7
TOTAL	0	0	32	50	32	6	0	0	120	100.0	
%	0.0	0.0	26.7	41.7	26.7	5.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 10.7 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 107

TOTAL NUMBER OF VALID HOURS= 2101

TOTAL NUMBER OF HOURS FOR PERIOD= 2208



## JOINT FREQUENCY TABLE

STABILITY CLASS -D-

FROM 10/ 1/95 0:00 TO 12/31/95 23:00

## PRIMARY TOWER

## WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	11	30	43	17	0	0	101	16.3	13.7
NNE	0	2	35	55	23	0	0	0	115	18.6	9.5
NE	0	1	19	61	19	0	0	0	100	16.2	9.9
ENE	0	0	8	39	18	0	0	0	65	10.5	10.8
E	0	0	1	13	11	2	0	0	27	4.4	12.2
ESE	0	1	5	11	1	0	0	0	18	2.9	8.8
SE	0	1	2	28	4	0	0	0	35	5.7	10.2
SSE	0	0	2	14	8	0	0	0	24	3.9	11.4
S	0	0	5	26	2	0	0	0	33	5.3	9.7
SSW	0	1	3	22	5	0	0	0	31	5.0	9.9
SW	0	0	1	8	0	0	0	0	9	1.5	9.1
WSW	0	1	3	2	0	0	0	0	6	1.0	6.3
W	0	1	5	1	1	0	0	0	8	1.3	6.3
WNW	0	1	3	0	0	0	0	0	4	0.6	4.7
NW	0	1	8	3	4	3	0	0	19	3.1	10.5
NNW	0	3	9	6	5	0	0	0	23	3.7	8.4
TOTAL	0	13	120	319	144	22	0	0	618	100.0	
%	0.0	2.1	19.4	51.6	23.3	3.6	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 10.5 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 107

TOTAL NUMBER OF VALID HOURS= 2101

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

## JOINT FREQUENCY TABLE

STABILITY CLASS -E-

FROM 10/ 1/95 0:00 TO 12/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	2	35	26	2	2	0	0	67	12.2	8.3
NNE	0	0	29	29	2	0	0	0	60	10.9	7.7
NE	0	1	16	22	0	0	0	0	39	7.1	8.1
ENE	0	3	13	9	0	0	0	0	25	4.5	6.8
E	0	0	17	7	1	0	0	0	25	4.5	7.3
ESE	0	1	11	3	0	0	0	0	15	2.7	6.0
SE	0	3	18	17	0	0	0	0	38	6.9	7.2
SSE	0	8	31	47	10	0	0	0	96	17.5	8.3
S	0	5	29	32	4	0	0	0	70	12.7	7.9
SSW	0	0	11	18	7	0	0	0	36	6.5	9.2
SW	0	0	1	4	0	0	0	0	5	0.9	8.4
WSW	0	0	1	1	0	0	0	0	2	0.4	7.3
W	0	1	2	0	0	0	0	0	3	0.5	4.1
WNW	0	2	2	2	0	0	0	0	6	1.1	5.6
NW	0	3	10	3	0	0	0	0	16	2.9	5.6
NNW	0	1	32	4	0	0	0	0	47	8.5	7.0
TOTAL	0	30	258	234	26	2	0	0	550	100.0	
%	0.0	5.5	46.9	42.5	4.7	0.4	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 7.7 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 107

TOTAL NUMBER OF VALID HOURS= 2101

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

## JOINT FREQUENCY TABLE

STABILITY CLASS -F-

FROM 10/ 1/95 0:00 TO 12/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 - 12.5	12.6 - 18.5	18.6 - 24.5	24.6 - 32.5	32.6+	TOTAL	%	AVE SPEED
N	0	4	5	8	1	0	0	0	18	10.1	6.7
NNE	0	2	11	10	0	0	0	0	23	12.9	6.6
NE	0	2	15	1	0	0	0	0	18	10.1	5.3
ENE	0	5	10	1	0	0	0	0	16	9.0	5.4
E	0	5	9	0	0	0	0	0	14	7.9	4.7
ESE	0	3	12	0	0	0	0	0	15	8.4	4.5
SE	0	5	6	0	0	0	0	0	11	6.2	4.1
SSE	0	0	21	1	0	0	0	0	22	12.4	5.9
S	0	1	15	0	0	0	0	0	16	9.0	6.1
SSW	0	1	1	0	0	0	0	0	2	1.1	3.8
SW	0	0	1	0	0	0	0	0	1	0.6	5.5
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	1	0	0	0	0	0	0	1	0.6	3.3
NW	0	3	1	0	0	0	0	0	4	2.2	3.6
NNW	0	2	12	3	0	0	0	0	17	9.6	5.9
TOTAL	0	34	119	24	1	0	0	0	178	100.0	
%	0.0	19.1	66.9	13.5	0.6	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 5.6 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 107

TOTAL NUMBER OF VALID HOURS= 2101

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

# JOINT FREQUENCY TABLE

STABILITY CLASS -G-

FROM 10/ 1/95 0:00 TO 12/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	5	14	2	0	0	0	0	21	7.8	5.2
NNE	0	8	22	2	0	0	0	0	32	11.9	5.0
NE	0	21	48	1	0	0	0	0	70	26.1	4.3
ENE	0	9	20	0	0	0	0	0	29	10.8	4.3
E	0	11	16	0	0	0	0	0	27	10.1	3.6
ESE	0	10	9	0	0	0	0	0	19	7.1	3.4
SE	0	7	11	0	0	0	0	0	18	6.7	3.9
SSE	0	1	4	0	0	0	0	0	5	1.9	6.3
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	1	0	0	0	0	0	0	1	0.4	1.8
SW	0	2	0	0	0	0	0	0	2	0.7	2.0
WSW	0	3	0	0	0	0	0	0	3	1.1	2.2
W	0	1	1	0	0	0	0	0	2	0.7	3.3
WNW	0	5	0	0	0	0	0	0	5	1.9	2.4
NW	0	6	5	0	0	0	0	0	11	4.1	3.4
NNW	0	5	17	1	0	0	0	0	23	8.6	4.5
TOTAL	0	95	167	6	0	0	0	0	268	100.0	
%	0.0	35.4	62.3	2.2	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 4.2 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 107

TOTAL NUMBER OF VALID HOURS= 2101

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

ALL CLASSES COMBINED

FROM 10/ 1/95 0:00 TO 12/31/95 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	11	74	73	71	29	0	0	258	12.3	11.2
NNE	0	12	110	112	30	2	0	0	266	12.7	8.4
NE	0	25	106	107	25	0	0	0	263	12.5	7.9
ENE	0	17	55	76	26	2	0	0	176	8.4	8.7
E	0	16	50	38	21	2	0	0	127	6.0	8.1
ESE	0	15	42	30	7	0	0	0	94	4.5	7.0
SE	0	16	44	63	9	0	0	0	132	6.3	7.8
SSE	0	9	60	74	34	0	0	0	177	8.4	9.1
S	0	6	54	96	33	1	0	0	190	9.0	9.6
SSW	0	3	24	47	36	1	0	0	111	5.3	10.5
SW	0	2	6	20	10	1	0	0	39	1.9	10.2
WSW	0	4	6	5	1	0	0	0	16	0.8	6.8
W	0	3	9	3	1	0	0	0	16	0.8	5.9
WNW	0	9	9	10	1	0	0	0	29	1.4	6.6
NW	0	14	30	14	11	3	0	0	72	3.4	7.8
NNW	0	11	79	32	10	3	0	0	135	6.4	7.4
TOTAL	0	173	758	800	326	44	0	0	2101	100.0	
%	0.0	8.2	36.1	38.1	15.5	2.1	0.0	0.0	100.0		

AVERAGE SPEED FOR THIS TABLE= 8.7 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 0

TOTAL NUMBER OF INVALID HOURS= 107

TOTAL NUMBER OF VALID HOURS= 2101

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

**APPENDIX A - RESULTS OF THE PROTECTED AREA  
DIRECT RADIATION MEASUREMENTS PROGRAM**

Table 1

1995 STPEGS PROTECTED AREA THERMOLUMINESCENT DOSIMETER MONITORING STATIONS						
Station Number	1st Qtr Average	2nd Qtr Average	3rd Qtr Average	4th Qtr Average	Average Rate	Average <sup>(1)</sup> Net Rate
	<sup>(2)</sup> (mR)	<sup>(2)</sup> (mR)	<sup>(2)</sup> (mR)	<sup>(2)</sup> (mR)	<sup>(2)</sup> (mR)	(mR/hour)
1	11.60	11.70	10.70	12.20	11.55	-0-
2	11.50	12.00	11.00	no data	11.50	-0-
3	9.80	10.20	10.10	11.10	10.30	-0-
4	10.50	10.70	11.20	12.10	11.13	-0-
5	11.60	11.80	12.90	13.50	12.45	-0-
6 <sup>(3)</sup>	12.50	13.00	15.20	14.10	13.70	-0-
7	11.80	12.00	13.40	13.80	12.75	-0-
8	10.50	11.10	11.20	12.40	11.30	-0-
9	10.90	11.40	11.10	13.00	11.60	-0-
10	10.70	11.00	10.80	12.30	11.20	-0-
11	10.20	9.90	9.90	11.70	10.43	-0-
12 <sup>(3)</sup>	10.00	10.10	10.40	12.40	10.73	-0-
13	10.20	10.10	9.90	11.40	10.40	-0-
14	10.00	9.80	10.00	11.40	10.30	-0-
15 <sup>(4)</sup>	10.40	9.80	10.40	12.50	10.78	-0-
16 <sup>(4)</sup>	10.10	9.90	10.50	12.60	10.78	-0-

## Notes:

Individual values normalized to a 91 day quarter.

Only calcium sulfate elements used in averages (E2, E3, and E4).

## (1) Net Rate:

Difference between the exposure rate in 1995 and the rate measured in 1986 due to natural background

$([\text{average rate}] - 15.4 \text{ mR background}) / 91 \text{ days} / 24 \text{ hours per day}$

As discussed in Section 2.12.1, exposure measured at all thermoluminescent dosimeter monitoring stations in 1995 was not greater than the natural background. The 1986 background rate of 15.4 milliroentgen per quarter measured at the site boundary was slightly higher than the values measured at the protected area fence during 1995. The protected area fence is closer to the reactors than the site boundary. These lower average exposure rates at the protected area fence are due to the reduction in natural background from construction related activities. The addition of sand and gravel fill materials shields the area from naturally occurring radiation in the underlying soil.

Zero (0) indicates background levels.

(2) mR = milliroentgen, a unit of exposure for X and gamma rays

(3) 4th Qtr Thermoluminescent Dosimeters found on the ground

(4) 4th Qtr Thermoluminescent Dosimeters found in trash pile



Table 2

## 1995 Dose at FM 521 Due to Onsite Staging Facility Operations

Time Interval	Dose/Trip at FM521 (52/3940) <sup>2</sup> *mrem/hr*hr/trip	Work Days * Trips/Day	Integrated Dose mrem
3-30-95 to 4-10-95	$1.74 \times 10^{-4} * .08 * 0.085$	7 * 2	$1.7 \times 10^{-5}$
4-11-95 to 5-11-95	$1.74 \times 10^{-4} * .10 * 0.085$	22 * 2	$6.5 \times 10^{-5}$
5-12-95 to 7-19-95	$1.74 \times 10^{-4} * .13 * 0.085$	48 * 2	$1.8 \times 10^{-4}$
7-20-95 to 7-27-95	$1.74 \times 10^{-4} * .17 * 0.085$	5 * 2	$2.5 \times 10^{-5}$
7-28-95 to 11-1-95	$1.74 \times 10^{-4} * .17 * 0.085$	69 * 2	$3.5 \times 10^{-4}$
11-2-95 to 11-9-95	$1.74 \times 10^{-4} * .15 * 0.085$	5 * 2	$2.2 \times 10^{-5}$
11-10-95 to 11-15-95	$1.74 \times 10^{-4} * .15 * 0.085$	5 * 2	$2.2 \times 10^{-5}$
11-16-95 to 11-29-95	$1.74 \times 10^{-4} * .15 * 0.085$	8 * 2	$3.6 \times 10^{-5}$
11-30-95 to 12-6-95	$1.74 \times 10^{-4} * .15 * 0.085$	5 * 2	$2.2 \times 10^{-5}$
12-7-95 to 12-18-95	$1.74 \times 10^{-4} * .08 * 0.085$	8 * 2	$1.9 \times 10^{-5}$
12-19-95 to 12-31-95	background	-	-
Total during 1995			$7.6 \times 10^{-4}$

# PROTECTED AREA MONITORING STATIONS

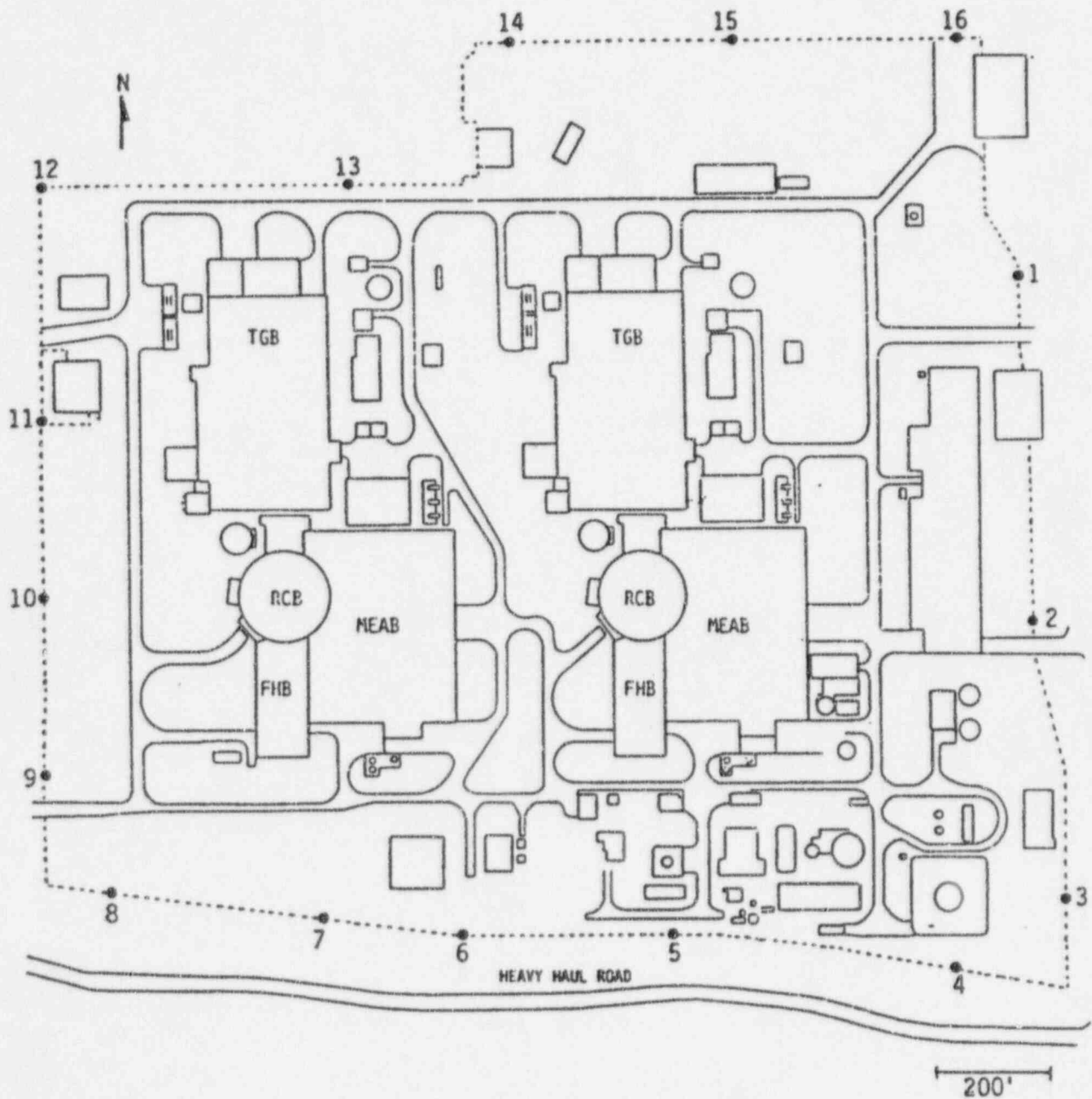


Figure 1

**APPENDIX B - REVISION TO ANNUAL RADIOACTIVE  
EFFLUENT RELEASE REPORT FOR 1994**

HOUSTON LIGHTING & POWER  
ANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
ALL LIQUID EFFLUENTS

Unit: 1  
Starting : 1-Jul-1994      Ending : 31-Dec-1994

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	2.031E-02	1.349E-02	15
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	5.795E-09	5.983E-09	
-----				
3. PERCENT OF ECL LIMIT (FRACTIONAL)	%	6.302E-04	8.267E-04	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	2.216E+ 02	3.689E+02	15
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	6.323E-05	1.635E-04	
-----				
3. % OF ECL LIMIT (1.00E-02 uCi/mL)	%	6.823E-01	1.635E+00	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	5.364E-04	2.228E-04	15
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	1.530E-10	9.877E-11	
-----				
3. PERCENT OF LIMIT (2.00E-04 uCi/mL)	%	7.653E-05	4.938E-05	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	0.000E+00	0.000E+00	15
-----				
E. WASTE VOL RELEASED				
-----				
1. TOTAL PRE-DILUTION VOLUME	LITERS	9.795E+06	6.876E+06	1
-----				
2. BATCH PRE-DILUTION VOLUME	LITERS	1.892E+06	1.340E+06	1
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	3.494E+09	2.249E+09	10
-----				

