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102-02252-WFC/JRP
August 20, 1992

U. S. Nuclear Regulatory Commission
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Dear Sirs:

Subject: **Palo Verde Nuclear Generating Station (PVNGS)**
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Semiannual Radioactive Effluent Release Report
File: 92-056-026

Pursuant to 10 CFR Part 50.36a(a)(2), and in accordance with Technical Specification 6.9.1.8, enclosed please find the Semiannual Radioactive Effluent Release Report for PVNGS Units 1, 2, and 3 for the six-month period ending June 30, 1992.

If you have any questions, please contact Thomas R. Bradish of my staff at (602) 393-5421.

Sincerely,

WFC/JRP/pmm

cc: J. B. Martin
J. A. Sloan
A. H. Gutterman

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1/1

PALO VERDE NUCLEAR GENERATING STATION

UNITS 1, 2, AND 3

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JANUARY 1, 1992 THROUGH JUNE 30, 1992

USNRC Dockets STN-50-528, STN-50-529, and STN-50-530

PALO VERDE NUCLEAR GENERATING STATION
UNITS 1, 2 AND 3

SEMIANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

JANUARY 1, 1992 THROUGH JUNE 30, 1992

USNRC Dockets STN-50-528, STN-50-529 and STN-50-530

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List of Tables

INTRODUCTION

This report summarizes meteorological data and doses from radioactive effluents for the Palo Verde Nuclear Generating Station (PVNGS) for the period of January through June 1992. The data presented meets the reporting requirements of Regulatory Guide 1.21 (Revision 1, June 1974) of the U.S. Nuclear Regulatory Commission and the PVNGS Technical Specifications.

The report is organized into three parts. Appendix A presents the effluent and waste disposal source term data. Appendix B presents a summary of onsite meteorological data for the report period. Appendix C presents the radiological doses from gaseous radioactive effluents.

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APPENDIX A

SOURCE TERMS

AND

EFFLUENT AND WASTE DISPOSAL REPORTS

1.0 REGULATORY LIMITS

1.1 Liquid Releases

a. PVNGS Technical Specification 3.11.1.1

The concentration of radioactive material discharged from the secondary system liquid waste to the onsite evaporation ponds shall be limited to the Lower Limit of Detectability (LLD) defined as 5×10^{-7} μCi/ml for the principal gamma emitters or 1×10^{-6} μCi/ml for I-131.

b. PVNGS Technical Specification 3.11.1.2

The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released, from each reactor unit, to areas at and beyond the SITE BOUNDARY shall be limited:

1 During any calendar quarter to less than or equal to 1.5 mrems to the total body and to less than or equal to 5 mrems to any organ, and

2 During any calendar year to less than or equal to 3 mrems to the total body and to less than or equal to 10 mrems to any organ.

1.2 Gaseous Releases

a. PVNGS Technical Specification 3.11.2.1

The dose rate due to radioactive materials released in gaseous effluents from the site shall be limited to the following:

1 For noble gases: Less than or equal to 500 mrems/yr to the total body and less than or equal to 3000 mrems/yr to the skin, and

2 For I-131 and I-133, for tritium, and for all radionuclides in particulate form with half-lives greater than 8 days: Less than or equal to 1500 mrems/yr to any organ.

b. PVNGS Technical Specification 3.11.2.2

The air dose due to noble gases released in gaseous effluents, from each reactor unit, to areas at and beyond the SITE BOUNDARY shall be limited to the following:

1 During any calendar quarter: Less than or equal to 5 mrads for gamma radiation and less than or equal to 10 mrads for beta radiation and,

2 During any calendar year: Less than or equal to 10 mrads for gamma radiation and less than or equal to 20 mrads for beta radiation.

c. PVNGS Technical Specification 3.11.2.3

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 8 days in gaseous effluents released, from each reactor unit, to areas at and beyond the SITE BOUNDARY shall be limited to the following:

1 During any calendar quarter: Less than or equal to 7.5 mrems to any organ and,

2 During any calendar year: Less than or equal to 15 mrems to any organ.

d. PVNGS Technical Specification 3.11.2.4

The GASEOUS RADWASTE SYSTEM and the VENTILATION EXHAUST TREATMENT SYSTEM shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected gaseous effluent air doses due to gaseous effluent releases, from each reactor unit, from the site, when averaged over 31 days, would exceed 0.2 mrad for gamma radiation and 0.4 mrad for beta radiation. The VENTILATION EXHAUST TREATMENT SYSTEM shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected doses due to gaseous effluent releases, from each reactor unit, to areas at and beyond the SITE BOUNDARY when averaged over 31 days, would exceed 0.3 mrem to any organ of a MEMBER OF THE PUBLIC.

1.3 Total Dose

a. PVNGS Technical Specification 3.11.4

The annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to radiation from uranium fuel cycle sources shall be limited to less than or equal to 25 mrems to the total body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrems.

2.0 MAXIMUM PERMISSIBLE CONCENTRATIONS

Air: Release Concentrations are limited to dose rate limits described in section 1.2.a of this report.

3.0 AVERAGE ENERGY

The average energy ($\bar{E}$) of the radionuclide mixture in releases of fission and activation gases is not applicable to PVNGS.

4.0 MEASUREMENTS AND APPROXIMATIONS OF TOTAL RADIOACTIVITY IN GASEOUS EFFLUENTS

For continuous releases, sampling is in accordance with PVNGS Technical Specification Table 4.11-2 (Units 1, 2 and 3). Particulate and iodine radionuclides are sampled continuously at the three exhaust points. The particulate filters and charcoal cartridges are exchanged for analysis four times per month. Noble gas and tritium are sampled at least once per 31 days. The hourly average Radiation Monitoring System (RMS) effluent monitor readings are used, when available, to account for increases and decreases in noble gas concentrations between noble gas grab samples. The tritium concentration is assumed constant between sampling periods.

For batch releases, sampling is also in accordance with PVNGS Technical Specification Table 4.11-2 (Units 1, 2 and 3). For containment purges, the noble gas concentration is adjusted to account for decreases or increases in concentration during the purge using RMS readings. The volume of air released during the purge is determined using the exhaust fan rated flow rate. For Waste Gas Decay Tank releases, the volume released is corrected to standard pressure.

The Lower Limit of Detection (LLD) of a measurement system is defined in Table 4.11-2 of the PVNGS Technical Specifications (Units 1, 2 and 3). An average LLD for each radionuclide is provided in Table A1.

5.0 BATCH RELEASES

All times are in hours

5.1 Gaseous

	Unit 1	Unit 2	Unit 3
Number of batch releases:	68	42	38
Total time period for batch releases:	2463.84	1709.62	715.80
Maximum time period for a batch release:	167.98	168.00	165.50
Average time period for a batch release:	36.23	40.71	18.84
Minimum time period for a batch release:	0.03	0.18	0.05

5.2 Liquid

None.

6.0 ABNORMAL RELEASES

None.

7.0 OFFSITE DOSE CALCULATION MANUAL (ODCM) AND PROCESS CONTROL PROGRAM (PCP) REVISIONS

There were no revisions to the ODCM or the PCP.

8.0 EFFLUENTS AND SOLID WASTES

8.1 Gaseous Effluents

The gaseous effluents for the first and second quarters are included in Tables A2 through A10. Included in these tables are summaries of the effluents and estimated total error.

8.2 Liquid Effluents

There were no liquid effluents from the PVNGS site.

8.3 Solid Waste

Solid waste shipments are summarized in Table A12.

9.0 MISCELLANEOUS INFORMATION

Releases made to the Evaporation Ponds have been limited, at the Chemical Waste Neutralizer tank, to the concentrations specified in PVNGS Technical Specification 3.11.1.1. In addition, PVNGS has imposed a limit of 3.00E-03 μCi/ml for tritium in tanks released to the Evaporation Ponds. This is the maximum permissible concentration for unrestricted areas for tritium in water from 10 CFR 20 Appendix B. The Evaporation Ponds were monitored in accordance with PVNGS Technical Specification 3.12.1. During this report period, Evaporation Pond #1 was empty from January 1 until June 1. Tritium concentrations in the Evaporation Ponds were less than the Lower Limit of Detection. Analysis of second quarter samples are not complete at this time. If positive results obtained, revised Evaporation Pond dose contributions will be included in the next report.

The average historical evaporation is approximately 45 inches, per Pond, for each six month period (January - June and July - December). This equates to 1.16E12 cc and 1.08E12 cc evaporated, per six month period, for Evaporation Ponds One and Two respectively. Using a X/Q of 5.0E-05 sec/m^3 for the evaporation ponds and equation 4-3 from the ODCM, there was no measureable dose contribution from the evaporation ponds during this six month period.

The results of the fourth quarter 1991 Strontium-89 and Strontium-90 analysis for continuous releases, which were not available at the time the July - December 1991 Semiannual Report was written, are summarized below. This additional data does not affect doses reported previously in the July - December 1991 Semiannual Report.

	Curies	
	Sr-89	Sr-90
Unit 1	< LLD	< LLD
Unit 2	4.17E-07	4.06E-07
Unit 3	1.54E-06	< LLD

Table A1

UNITS 1, 2 AND 3

GASEOUS EFFLUENTS - AVERAGE LOWER LIMIT OF DETECTION

μCi/cc

NUCLIDE	CONTINUOUS	BATCH
Argon-41	4.50E-08	4.50E-08
Krypton-85	7.40E-06	7.40E-06
Krypton-85m	2.20E-08	2.20E-08
Krypton-87	5.70E-08	5.70E-08
Krypton-88	7.40E-08	7.40E-08
Xenon-131m	9.10E-07	9.10E-07
Xenon-133	6.30E-08	6.30E-08
Xenon-133m	1.90E-07	1.90E-07
Xenon-135	2.00E-08	2.00E-08
Xenon-135m	8.90E-08	8.90E-08
Xenon-138	2.00E-07	2.00E-07
Iodine-131	8.00E-14	7.00E-12
Iodine-132	6.60E-12	1.90E-11
Iodine-133	4.70E-13	1.10E-11
Iodine-134	5.90E-11	8.20E-11
Iodine-135	7.00E-12	5.50E-11
Antimony-122	2.20E-13	1.90E-11
Antimony-124	8.40E-14	1.70E-11
Barium-140	3.40E-13	5.70E-11
Bromine-82	3.30E-13	1.40E-11
Cerium-141	8.70E-14	3.10E-11
Cerium-144	3.60E-13	6.50E-11
Cesium-134	1.00E-13	2.60E-11
Cesium-137	8.10E-14	1.70E-11
Cesium-138	5.20E-10	7.30E-10
Chromium-51	6.90E-13	1.40E-10
Cobalt-58	8.50E-14	1.70E-11
Cobalt-60	1.00E-13	1.90E-11
Iron-59	1.70E-13	3.20E-11
Lanthanum-140	2.80E-13	2.10E-11
Manganese-54	8.30E-14	1.70E-11
Molybdenum-99	2.40E-13	2.80E-11
Niobium-95	8.70E-14	1.80E-11
Rubidium-88	1.90E-08	1.90E-08
Ruthenium-103	7.40E-14	1.50E-11
Strontium-89	2.15E-15	(1)
Strontium-90	5.60E-16	(1)
Tellurium-123m	6.60E-14	1.50E-11
Tritium	3.80E-07	3.80E-07
Zinc-65	1.90E-13	3.80E-11
Zirconium-95	1.80E-13	4.10E-11
Gross Alpha	3.60E-15	(1)

(1) Not required for batch releases.

Table A2
UNIT 1 1992
GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	UNIT	QUARTER #1	QUARTER #2	EST. TOTAL ERROR % (1)
A. Fission & activation gases				
1. Total release	Ci	1.86E+03	5.34E+00	3.54E+01
2. Average release rate for period	μCi/sec	2.39E+02	6.79E-01	
3. Percent of technical specification limit	%	NA (2)	NA (2)	
B. Iodine 131				
1. Total Iodine 131	Ci	9.61E-03	2.47E-04	3.32E+01
2. Average release rate for period	μCi/sec	1.24E-03	3.15E-05	
3. Percent of technical specification limit	%	NA (2)	NA (2)	
C. Particulates				
1. Particulates with half-lives > 8 days	Ci	6.02E-04	5.42E-04	3.43E+01
2. Average release rate for period	μCi/sec	7.74E-05	6.89E-05	
3. Percent of technical specification limit	%	NA (2)	NA (2)	
4. Gross Alpha radio-activity	Ci	< LLD	1.29E-06	
D. Tritium				
1. Total release	Ci	7.67E+01	2.31E+01	3.85E+01
2. Average release rate for period	μCi/sec	9.86E+00	2.94E+00	
3. Percent of technical specification limit	%	NA (2)	NA (2)	

(1) Estimated total error methodology is presented in Table A11.

(2) See Table A4 for percent of technical specification limits.

Table A3

UNIT 1 1992

GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

Nuclides Released	Unit	Continuous Mode Quarter #1	Continuous Mode Quarter #2	Batch Mode Quarter #1	Batch Mode Quarter #2
1. Fission gases					
Argon-41	Ci	9.93E-01	< LLD	7.53E-01	6.10E-02
Krypton-83m	Ci	< LLD	< LLD	< LLD	< LLD
Krypton-85	Ci	< LLD	< LLD	5.41E+01	6.64E-01
Krypton-85m	Ci	4.68E-01	< LLD	2.11E-01	< LLD
Krypton-87	Ci	1.74E-02	< LLD	4.00E-02	< LLD
Krypton-88	Ci	< LLD	< LLD	1.93E-01	< LLD
Krypton-89	Ci	< LLD	< LLD	< LLD	< LLD
Krypton-90	Ci	< LLD	< LLD	< LLD	< LLD
Xenon-131m	Ci	1.25E+01	7.06E-01	2.00E+01	9.51E-02
Xenon-133	Ci	6.07E+02	2.69E+00	1.14E+03	4.77E-01
Xenon-133m	Ci	1.56E+00	< LLD	6.81E+00	5.20E-04
Xenon-135	Ci	9.88E+00	6.37E-01	6.71E+00	3.64E-03
Xenon-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xenon-137	Ci	< LLD	< LLD	< LLD	< LLD
Xenon-138	Ci	< LLD	< LLD	< LLD	< LLD
Total for period	Ci	6.32E+02	4.04E+00	1.23E+03	1.30E+00
2. Iodines					
Iodine-131	Ci	5.05E-03	1.26E-04	4.56E-03	1.21E-04
Iodine-132	Ci	1.15E-03	< LLD	2.03E-03	< LLD
Iodine-133	Ci	1.55E-05	1.13E-04	3.56E-04	2.15E-06
Iodine-134	Ci	< LLD	< LLD	< LLD	< LLD
Iodine-135	Ci	< LLD	< LLD	5.53E-06	< LLD
Total for period	Ci	6.22E-03	2.39E-04	6.95E-03	1.23E-04

Table A3 (Continued)

UNIT 1 1992

GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

Nuclides Released	Unit	Continuous Mode Quarter #1	Continuous Mode Quarter #2	Batch Mode Quarter #1	Batch Mode Quarter #2
3. Particulates					
Antimony-124	Ci	< LLD	2.69E-05	< LLD	< LLD
Barium-140	Ci	< LLD	< LLD	< LLD	< LLD
Bromine-82	Ci	< LLD	< LLD	1.07E-04	4.44E-06
Cerium-141	Ci	< LLD	5.35E-06	< LLD	< LLD
Cerium-144	Ci	< LLD	1.71E-05	< LLD	< LLD
Cesium-134	Ci	1.04E-05	9.09E-07	3.41E-08	7.56E-08
Cesium-137	Ci	1.08E-05	< LLD	2.60E-08	7.45E-08
Cesium-138	Ci	< LLD	< LLD	1.25E-04	< LLD
Cromium-51	Ci	< LLD	6.42E-05	< LLD	< LLD
Cobalt-58	Ci	8.10E-06	1.23E-04	2.42E-08	< LLD
Cobalt-60	Ci	1.96E-06	3.94E-05	< LLD	< LLD
Iron-59	Ci	< LLD	< LLD	< LLD	< LLD
Lanthanum-140	Ci	< LLD	< LLD	< LLD	< LLD
Manganese-54	Ci	< LLD	1.02E-05	< LLD	< LLD
Molybdenum-99	Ci	< LLD	< LLD	< LLD	< LLD
Niobium-95	Ci	2.10E-06	9.43E-05	< LLD	< LLD
Rubidium-88	Ci	< LLD	< LLD	8.83E-03	2.14E-06
Ruthenium-103	Ci	2.66E-04	4.18E-05	1.31E-04	< LLD
Ruthenium-106	Ci	8.95E-05	3.94E-05	< LLD	< LLD
Selenuim-75	Ci	4.27E-05	1.19E-05	< LLD	< LLD
Silver-110m	Ci	2.36E-06	5.63E-06	< LLD	< LLD
Strontium-89	Ci	< LLD	(1)	(2)	(2)
Strontium-90	Ci	< LLD	(1)	(2)	(2)
Tellurium-123m	Ci	3.70E-05	3.60E-06	< LLD	< LLD
Tritium	Ci	< LLD	< LLD	7.67E+01	2.31E+01
Zinc-65	Ci	< LLD	< LLD	< LLD	< LLD
Zirconium-95	Ci	< LLD	5.77E-05	< LLD	< LLD
Total for period	Ci	4.71E-04	5.42E-04	7.67E+01	2.31E+01

(1) Analysis not yet completed. Additional information will be included in the next Semiannual Report.

(2) Not required for batch releases.

Table A4

PVNGS UNIT 1
RADIATION DOSES AT AND BEYOND THE SITE BOUNDARY(1) FOR 1992

	Unit	Quarter #1	Quarter #2	Quarter #3	Quarter #4	Total for 1992
Gamma Air Dose	mrad	1.91E-01	8.62E-04	N/A	N/A	1.92E-01
T.S. 3.11.2.2 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% T.S. Limit	%	3.83E+00	1.72E-02	N/A	N/A	1.92E+00
Beta Air Dose	mrad	5.75E-01	2.06E-03	N/A	N/A	5.77E-01
T.S. 3.11.2.2 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% T.S. Limit	%	5.75E+00	2.06E-02	N/A	N/A	2.89E+00
Maximum Organ Dose		Infant Thyroid	Child(2) Thyroid			Child (2) Thyroid
(excluding skin)	mrem	3.98E-01	6.23E-02	N/A	N/A	4.42E-01
T.S. 3.11.2.3 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% T.S. Limit	%	5.30E+00	8.31E-01	N/A	N/A	2.95E+00

(1) Calculations are based on parameters and methodologies of the ODCM using historical meteorology.

(2) Does not include 2nd quarter Sr-89, 90 results.

Table A5
UNIT 2 1992
GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	UNIT	QUARTER #1	QUARTER #2	EST. TOTAL ERROR % (1)
A. Fission & activation gases				
1. Total release	Ci	1.20E-01	2.44E-01	3.54E+01
2. Average release rate for period	μCi/sec	1.54E-02	3.10E-02	
3. Percent of technical specification limit	%	NA (2)	NA (2)	
B. Iodine 131				
1. Total Iodine 131	Ci	3.80E-06	< LLD	3.32E+01
2. Average release rate for period	μCi/sec	4.89E-07	< LLD	
3. Percent of technical specification limit	%	NA (2)	NA (2)	
C. Particulates				
1. Particulates with half-lives > 8 days	Ci	1.51E-07	< LLD	3.43E+01
2. Average release rate for period	μCi/sec	1.95E-08	< LLD	
3. Percent of technical specification limit	%	NA (2)	NA (2)	
4. Gross Alpha radio-activity	Ci	< LLD	< LLD	
D. Tritium				
1. Total release	Ci	8.73E+01	5.28E+01	3.85E+01
2. Average release rate for period	μCi/sec	1.12E+01	6.72E+00	
3. Percent of technical specification limit	%	NA (2)	NA (2)	

(1) Estimated total error methodology is presented in Table A11.

(2) See Table A7 for percent of technical specification limits.

Table A6

UNIT 2 1992

GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

Nuclides Released	Unit	Continuous Mode Quarter #1	Continuous Mode Quarter #2	Batch Mode Quarter #1	Batch Mode Quarter #2
1. Fission gases					
Argon-41	Ci	< LLD	< LLD	8.45E-02	1.66E-01
Krypton-83m	Ci	< LLD	< LLD	< LLD	< LLD
Krypton-85	Ci	< LLD	< LLD	< LLD	< LLD
Krypton-85m	Ci	< LLD	< LLD	< LLD	< LLD
Krypton-87	Ci	< LLD	< LLD	< LLD	< LLD
Krypton-88	Ci	< LLD	< LLD	< LLD	< LLD
Krypton-89	Ci	< LLD	< LLD	< LLD	< LLD
Krypton-90	Ci	< LLD	< LLD	< LLD	< LLD
Xenon-131m	Ci	< LLD	< LLD	< LLD	< LLD
Xenon-133	Ci	< LLD	< LLD	3.48E-02	7.67E-02
Xenon-133m	Ci	< LLD	< LLD	< LLD	< LLD
Xenon-135	Ci	< LLD	< LLD	8.01E-04	9.88E-04
Xenon-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xenon-137	Ci	< LLD	< LLD	< LLD	< LLD
Xenon-138	Ci	< LLD	< LLD	< LLD	< LLD
Total for period	Ci	< LLD	< LLD	1.20E-01	2.44E-01
2. Iodines					
Iodine-131	Ci	3.80E-06	< LLD	< LLD	< LLD
Iodine-132	Ci	< LLD	< LLD	< LLD	< LLD
Iodine-133	Ci	< LLD	< LLD	< LLD	< LLD
Iodine-134	Ci	< LLD	< LLD	< LLD	< LLD
Iodine-135	Ci	< LLD	< LLD	< LLD	< LLD
Total for period	Ci	3.80E-06	< LLD	< LLD	< LLD

Table A6 (Continued)

UNIT 2 1992

GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

Nuclides Released	Unit	Continuous Mode Quarter #1	Continuous Mode Quarter #2	Batch Mode Quarter #1	Batch Mode Quarter #2
3. Particulates					
Antimony-124	Ci	< LLD	< LLD	< LLD	< LLD
Barium-140	Ci	< LLD	< LLD	< LLD	< LLD
Bromine-82	Ci	< LLD	< LLD	1.13E-05	1.54E-05
Cerium-141	Ci	< LLD	< LLD	< LLD	< LLD
Cerium-144	Ci	< LLD	< LLD	< LLD	< LLD
Cesium-134	Ci	< LLD	< LLD	< LLD	< LLD
Cesium-137	Ci	< LLD	< LLD	< LLD	< LLD
Cesium-138	Ci	< LLD	< LLD	< LLD	< LLD
Cromium-51	Ci	< LLD	< LLD	< LLD	< LLD
Cobalt-58	Ci	< LLD	< LLD	< LLD	< LLD
Cobalt-60	Ci	< LLD	< LLD	< LLD	< LLD
Iron-59	Ci	< LLD	< LLD	< LLD	< LLD
Lanthanum-140	Ci	< LLD	< LLD	< LLD	< LLD
Manganese-54	Ci	< LLD	< LLD	< LLD	< LLD
Molybdenum-99	Ci	< LLD	< LLD	< LLD	< LLD
Niobium-95	Ci	< LLD	< LLD	< LLD	< LLD
Rubidium-88	Ci	< LLD	< LLD	< LLD	< LLD
Ruthenium-103	Ci	< LLD	< LLD	< LLD	< LLD
Strontium-89	Ci	< LLD	(1)	(2)	(2)
Strontium-90	Ci	1.51E-07	(1)	(2)	(2)
Tritium	Ci	< LLD	< LLD	8.73E+01	5.28E+01
Zinc-65	Ci	< LLD	< LLD	< LLD	< LLD
Zirconium-95	Ci	< LLD	< LLD	< LLD	< LLD
Total for period	Ci	1.51E-07	< LLD	8.73E+01	5.28E+01

(1) Analysis not yet completed. Additional information will be included in the next Semiannual Report.

(2) Not required for batch releases.

Table A7

PVNGS UNIT 2
RADIATION DOSES AT AND BEYOND THE SITE BOUNDARY(1) FOR 1992

	Unit	Quarter #1	Quarter #2	Quarter #3	Quarter #4	Total for 1992
Gamma Air Dose	mrad	2.26E-04	4.44E-04	N/A	N/A	6.70E-04
T.S. 3.11.2.2 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% T.S. Limit	%	4.52E-03	8.89E-03	N/A	N/A	6.70E-03
Beta Air Dose	mrad	8.91E-05	1.77E-04	N/A	N/A	2.66E-04
T.S. 3.11.2.2 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% T.S. Limit	%	8.91E-04	1.77E-03	N/A	N/A	1.33E-03
Maximum Organ Dose		Child Thyroid	Child(2) Thyroid			Child (2) Thyroid
(excluding skin)	mrem	2.16E-01	1.31E-01	N/A	N/A	3.46E-01
T.S. 3.11.2.3 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% T.S. Limit	%	2.88E+00	1.74E+00	N/A	N/A	2.31E+00

(1) Calculations are based on parameters and methodologies of the ODCM using historical meteorology.

(2) Does not include 2nd quarter Sr-89, 90 results.

Table A8
UNIT 3 1992
GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	UNIT	QUARTER #1	QUARTER #2	EST. TOTAL ERROR % (1)
A. Fission & activation gases				
1. Total release	Ci	4.57E-01	1.17E+00	3.54E+01
2. Average release rate for period	μCi/sec	5.87E-02	1.49E-01	
3. Percent of technical specification limit	%	NA (2)	NA (2)	
B. Iodine 131				
1. Total Iodine 131	Ci	2.30E-07	3.98E-07	3.32E+01
2. Average release rate for period	μCi/sec	2.96E-08	5.06E-08	
3. Percent of technical specification limit	%	NA (2)	NA (2)	
C. Particulates				
1. Particulates with half-lives > 8 days	Ci	3.99E-06	< LLD	3.43E+01
2. Average release rate for period	μCi/sec	5.13E-07	< LLD	
3. Percent of technical specification limit	%	NA (2)	NA (2)	
4. Gross Alpha radio-activity	Ci	< LLD	< LLD	
D. Tritium				
1. Total release	Ci	1.08E+02	5.45E+01	3.85E+01
2. Average release rate for period	μCi/sec	1.39E+01	6.93E+00	
3. Percent of technical specification limit	%	NA (2)	NA (2)	

(1) Estimated total error methodology is presented in Table A11.

(2) See Table A10 for percent of technical specification limits.

Table A9

UNIT 3 1992

GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

Nuclides Released	Unit	Continuous Mode Quarter #1	Continuous Mode Quarter #2	Batch Mode Quarter #1	Batch Mode Quarter #2
1. Fission gases					
Argon-41	Ci	< LLD	< LLD	7.61E-02	8.04E-02
Krypton-83m	Ci	< LLD	< LLD	< LLD	< LLD
Krypton-85	Ci	< LLD	< LLD	1.38E-01	< LLD
Krypton-85m	Ci	< LLD	< LLD	1.84E-05	< LLD
Krypton-87	Ci	< LLD	< LLD	< LLD	< LLD
Krypton-88	Ci	< LLD	< LLD	< LLD	< LLD
Krypton-89	Ci	< LLD	< LLD	< LLD	< LLD
Krypton-90	Ci	< LLD	< LLD	< LLD	< LLD
Xenon-131m	Ci	< LLD	< LLD	< LLD	< LLD
Xenon-133	Ci	2.63E-02	< LLD	2.10E-01	2.19E-01
Xenon-133m	Ci	< LLD	< LLD	2.43E-04	4.37E-04
Xenon-135	Ci	< LLD	8.64E-01	6.58E-03	6.78E-03
Xenon-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xenon-137	Ci	< LLD	< LLD	< LLD	< LLD
Xenon-138	Ci	< LLD	< LLD	< LLD	< LLD
Total for period	Ci	2.63E-02	8.64E-01	4.30E-01	3.07E-01
2. Iodines					
Iodine-131	Ci	< LLD	< LLD	2.30E-07	3.98E-07
Iodine-132	Ci	< LLD	< LLD	9.98E-08	< LLD
Iodine-133	Ci	< LLD	< LLD	8.19E-07	1.24E-06
Iodine-134	Ci	< LLD	< LLD	< LLD	< LLD
Iodine-135	Ci	< LLD	< LLD	< LLD	< LLD
Total for period	Ci	< LLD	< LLD	1.15E-06	1.64E-06

Table A9 (Continued)

UNIT 3 1992

GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

Nuclides Released	Unit	Continuous Mode Quarter #1	Continuous Mode Quarter #2	Batch Mode Quarter #1	Batch Mode Quarter #2
3. Particulates					
Antimony-124	Ci	< LLD	< LLD	2.05E-08	< LLD
Barium-140	Ci	< LLD	< LLD	< LLD	< LLD
Bromine-82	Ci	< LLD	< LLD	2.33E-05	2.28E-05
Cerium-141	Ci	< LLD	< LLD	< LLD	< LLD
Cerium-144	Ci	< LLD	< LLD	< LLD	< LLD
Cesium-134	Ci	< LLD	< LLD	< LLD	< LLD
Cesium-137	Ci	< LLD	< LLD	< LLD	< LLD
Cesium-138	Ci	< LLD	< LLD	1.40E-06	< LLD
Cromium-51	Ci	< LLD	< LLD	< LLD	< LLD
Cobalt-58	Ci	< LLD	< LLD	< LLD	< LLD
Cobalt-60	Ci	1.59E-06	< LLD	< LLD	< LLD
Iron-59	Ci	< LLD	< LLD	< LLD	< LLD
Lanthanum-140	Ci	< LLD	< LLD	< LLD	< LLD
Manganese-54	Ci	< LLD	< LLD	< LLD	< LLD
Molybdenum-99	Ci	< LLD	< LLD	< LLD	< LLD
Niobium-95	Ci	< LLD	< LLD	< LLD	< LLD
Rubidium-88	Ci	< LLD	< LLD	4.49E-05	2.81E-05
Ruthenium-103	Ci	< LLD	< LLD	< LLD	< LLD
Selenium-75	Ci	2.38E-06	< LLD	< LLD	< LLD
Strontium-89	Ci	< LLD	(1)	(2)	(2)
Strontium-90	Ci	< LLD	(1)	(2)	(2)
Tritium	Ci	< LLD	< LLD	1.08E+02	5.45E+01
Zinc-65	Ci	< LLD	< LLD	< LLD	< LLD
Zirconium-95	Ci	< LLD	< LLD	< LLD	< LLD
Total for period	Ci	3.97E-06	< LLD	1.08E+02	5.45E+01

(1) Analysis not yet completed. Additional information will be included in the next Semiannual Report.

(2) Not required for batch releases.

Table A10

PVNGS UNIT 3
RADIATION DOSES AT AND BEYOND THE SITE BOUNDARY(1) FOR 1992

	Unit	Quarter #1	Quarter #2	Quarter #3	Quarter #4	Total for 1992
Gamma Air Dose	mrad	2.28E-04	7.05E-04	N/A	N/A	9.33E-04
T.S. 3.11.2.2 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% T.S. Limit	%	4.55E-03	1.41E-02	N/A	N/A	9.33E-03
Beta Air Dose	mrad	2.21E-04	7.45E-04	N/A	N/A	9.66E-04
T.S. 3.11.2.2 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% T.S. Limit	%	2.21E-03	7.45E-03	N/A	N/A	4.83E-03
Maximum Organ Dose		Child Thyroid	Child(2) Thyroid			Child (2) Thyroid
(excluding skin)	mrem	2.68E-01	1.35E-01	N/A	NA/	4.03E-01
T.S. 3.11.2.3 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% T.S. Limit	%	3.57E+00	1.80E+00	N/A	N/A	2.69E+00

(1) Calculations are based on parameters and methodologies of the ODCM using historical meteorology.

(2) Does not include 2nd quarter Sr-89, 90 results.

Table A11

Estimation of Total Percent Error

The estimated total error is calculated as follows:

$$\text{Total Percent Error} = (E_1^2 + E_2^2 + E_3^2 + \ldots + E_n^2)^{1/2}$$

Where E_n = Percent error associated with each contributing parameter.

Parameters contributing to errors in the measurement of gaseous effluents are; process flow rates, sample collection, analytical counting and tank volumes.

The following values (%) were used for error calculations.

Fission & Act. gases	I-131	Partic-ulates	Tritium	
25	25	25	25	Sample counting error
10	10	10	10	Counting system calibration error
5	5	5	5	Counting system source error
20	N/A	N/A	N/A	Temperature/volume correction error
10	10	10	10	Process flow measuring device
N/A	15	15	15	Sample flow measuring device
N/A	5	N/A	N/A	Iodine collection efficiency error
N/A	N/A	10	N/A	Plateout error
N/A	N/A	N/A	20	Bubbler collection efficiency error
N/A	N/A	N/A	2	Sample volume transfer error (pipette)
N/A	N/A	N/A	2	Sample volume error (graduate)

Table A12

SOLID WASTE SUMMARY FOR PERIOD January 1992 - June 1992

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

1.0 Type of Waste		Unit	6-month period	estimated total error %
1.a)	spent resin, filters, sludges, evaporator bottoms, etc.	M^3	7.94E+01	N/A
		Ci	2.11E+02	± 25%
1.b)	dry compressible waste, contaminated equipment, etc.	M^3	3.81E+01	N/A
		Ci	1.99E+00	± 25%
1.c)	irradiated components, fuel rods, etc.	M^3	0.00E+00	N/A
		Ci	0.00E+00	N/A
1.d)	solidified oil	M^3	0.00E+00	N/A
		Ci	0.00E+00	± 25%

NOTE

Volume and activity for dry compressible waste, contaminated equipment, etc., include PVNGS waste disposed of after being processed by a volume reduction facility.

2.0 Principal Radionuclides

2.a) Estimate of major nuclide concentration for spent resins, filter sludges, evaporator bottoms, etc., as determined by measurement. (** indicates scaled nuclides)

WASTE CLASS		NUCLIDE NAME	PERCENT ABUNDANCE	CURIES
A	**	Fe-55	51.508%	5.78E+00
A		Co-60	16.181%	9.42E-01
A	**	Ni-63	11.636%	1.70E+00
A		Sb-124	5.194%	4.79E-01
A	**	H-3	3.309%	4.04E-01
A		Co-58	2.789%	9.41E-01
A		Cs-137	2.722%	3.16E-01
A		Ag-110m	2.438%	2.72E-01
A	**	C-14	2.218%	2.76E-01
A		Cs-134	1.821%	6.30E-02
A		Mn-54	0.565%	1.12E-03
A	**	Tc-99	0.248%	3.43E-02
A		Sr-90	0.006%	8.70E-04

2.b) Estimate of major nuclide concentration for spent resins, filter sludges, evaporator bottoms, etc., as determined by measurement. (** indicates scaled nuclides)

WASTE CLASS		NUCLIDE NAME	PERCENT ABUNDANCE	CURIES
B		Cs-137	39.509%	2.70E+01
B		Cs-134	19.251%	1.31E+01
B	**	Fe-55	11.735%	4.06E+00
B		Co-60	11.385%	5.13E+00
B	**	Ni-63	5.274%	1.92E+00
B		Co-58	5.193%	1.27E+00
B		Mn-54	2.168%	8.11E-01
B		Sb-124	1.690%	2.60E-01
B		Sb-125	1.446%	2.22E-01
B	**	C-14	0.939%	2.15E-01
B	**	Sr-90	0.193%	1.33E-01
B	**	H-3	0.153%	1.29E-01
B	**	Pu-241	0.070%	6.65E-02

2.c) Estimate of major nuclide concentration for spent resins, filter sludges, evaporator bottoms, etc., as determined by measurement. (** indicates scaled nuclides)

WASTE CLASS		NUCLIDE NAME	PERCENT ABUNDANCE	CURIES
C	**	Fe-55	48.001%	1.51E+01
C		Co-60	16.135%	4.97E+00
C	**	Ni-63	9.769%	4.17E+00
C		Co-58	5.400%	2.24E+00
C		Cr-51	4.074%	1.69E+00
C		Sb-124	3.680%	1.92E+00
C		Nb-95	2.124%	1.11E+00
C	**	C-14	1.800%	7.16E-01
C		Mn-54	1.502%	5.20E-01
C		Ru-106	1.449%	4.51E-01
C		Zr-95	1.066%	5.55E-01
C		Fe-59	0.899%	1.57E-01
C		Ce-144	0.839%	1.47E-01
C		Cs-137	0.501%	2.37E-01
C	**	Pu-241	0.318%	8.10E-02
C	**	Sr-90	0.031%	1.65E-01
C	**	H-3	0.002%	3.00E-04

2.d) Estimate of major nuclide concentration for dry compressible waste, contaminated equipment, etc., as determined by measurement. (** indicates scaled nuclides)

WASTE CLASS		NUCLIDE NAME	PERCENT ABUNDANCE	CURIES
A	**	Fe-55	28.712%	2.24E-01
A		Co-60	24.496%	5.90E-02
A		Cs-137	18.879%	1.63E-01
A		Cs-134	7.508%	4.73E-02
A		Co-58	6.956%	4.71E-02
A	**	Ni-63	5.812%	4.99E-02
A		Sb-124	3.996%	3.06E-02
A		Mn-54	0.802%	1.03E-05
A		Nb-95	0.717%	1.35E-02
A		Ag-110m	0.675%	1.27E-02
A	**	C-14	0.500%	4.69E-03
A		Sb-125	0.418%	7.87E-03
A	**	H-3	0.348%	3.16E-03
A	**	Sr-90	0.007%	1.40E-04

3.0 Solid Waste Disposition

3.a)

SHIPMENTS	TYPE OF SHIPMENT	TYPE OF CONTAINER	MODE OF TRANSPORTATION	DESTINATION
2	Type B	Type B	Truck	Hanford
16	LSA	STC	Truck	Hanford
4	LSA	Type A	Truck	Hanford

3.b) Irradiated Fuel Shipments: None

Table A12 (Continued)

3.c) Supplemental Information

NUMBER OF CONTAINERS	CONTAINER VOLUME FT^3	TYPE OF WASTE	CONTAINER TYPE	SOLIDIFICATION AGENT
4	199.4	Evap Bottoms	STC	Portland Cement
2	138.8	Dewatered Resin	A	None
2	199.4	Dewatered Resin	STC	None
104	7.5	Compacted DAW	STC	None
126	7.5	RVR Concentrates	STC	None
3	107.5	Non-compacted DAW	STC	None
2	49.9	Filters	A	None
2	49.9	Filters	B	None
1	132.4	Non-compacted DAW	STC	None
1	202.1	Dewatered Resin	STC	None
2	54.3	Non-compacted DAW	STC	None

0 Changes to Processes and/or Equipment

4.a) No changes were made to the Solid Radwaste Process Control Program.

4.b) No major changes were made to installed plant equipment.

4.c) No major changes were made to installed plant equipment. Therefore, predicted release or quantity of solid waste generated, remain unchanged as addressed in the FSAR.

4.d) No major changes were made to installed plant equipment. Therefore, predicted exposures to the public and general population, remain unchanged as addressed in the FSAR.

Table A13

Units 1, 2 and 3

EFFLUENT MONITORING INSTRUMENTATION OUT OF SERVICE GREATER THAN 30 DAYS

NONE

APPENDIX B

METEOROLOGY

JOINT FREQUENCY DISTRIBUTION TABLES

The tables presented in this section are results obtained from processing the hourly meteorological data collected at the Palo Verde Nuclear Generating Station for the period of January - June 1992. The joint frequency distribution (JFD) tables represent the frequency, in terms of the number of observations, that a particular wind speed, wind direction, and stability category occurred simultaneously. On a quarterly and semi-annual basis, the JFDs were produced for 35-foot wind speed and wind direction by atmospheric stability class corresponding to the seven Pasquill stability categories, and for wind speed and wind direction for all stability classes combined. Atmospheric stability was classified per Regulatory Guide 1.23, using the 200-foot to 35-foot temperature difference (delta T).

In accordance with NUREG-0133, the batch releases for the first and second quarters of 1992 were considered as "long term", since for each quarter, the sum of the batch release periods for each unit exceeded 150 hours. Consequently, the JFDs for the batch releases for both quarters are the same as for the continuous releases.

Table B1

JFDs of 35-Foot Wind Versus Delta T

January - March 1992

T FREQUENCY DISTRIBUTION ANALYSIS
IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 1/ 1/92 - 3/31/92

1ST-QTR-92

STABILITY CLASS A

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.51- 6.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.51- 8.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.51-11.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
11.51-14.50	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
14.51-20.50	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	3
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	2	2	0	0	0	0	0	0	1	0	0	0	0	1	6

STABILITY CLASS B

ABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
MEASURED AT: 35.0 FEET
THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.51- 6.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.51- 8.50	0	0	0	0	4	0	0	1	0	1	2	0	0	0	0	0	8
8.51-11.50	0	0	2	2	1	0	0	0	0	2	3	3	0	0	0	0	13
11.51-14.50	0	0	1	2	1	0	0	0	0	2	1	1	0	0	0	0	8
14.51-20.50	0	0	1	4	0	0	0	0	0	2	1	0	0	0	0	2	10
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	4	8	6	0	0	1	0	7	7	4	0	0	0	2	39

[redacted]T FREQUENCY DISTRIBUTION ANALYSIS
[redacted]IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 1/ 1/92 - 3/31/92

1ST-QTR-92

STABILITY CLASS C

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3.51- 4.50	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4.51- 5.50	0	2	1	2	0	0	0	0	0	2	0	0	0	0	0	0	7
5.51- 6.50	0	0	2	1	1	0	0	0	2	0	2	0	0	0	0	0	8
6.51- 8.50	0	0	2	7	1	1	0	1	2	3	2	0	0	0	0	0	19
8.51-11.50	0	0	2	12	4	3	0	0	1	2	4	0	0	0	0	0	28
11.51-14.50	1	0	0	1	1	0	0	0	0	0	5	2	0	0	1	0	11
14.51-20.50	0	1	0	3	0	0	0	0	0	0	3	0	0	0	0	0	7
>20.50	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	2	3	9	27	7	4	0	1	5	7	16	2	0	0	1	0	84

STABILITY CLASS D

[redacted]ABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
[redacted] MEASURED AT: 35.0 FEET
[redacted] THRESHOLD AT: .75 MPH
[redacted]INT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	4
1.51- 2.50	3	2	1	1	1	1	2	1	0	1	1	0	0	5	6	2	27
2.51- 3.50	7	7	6	3	5	5	4	3	5	10	8	8	3	4	4	8	90
3.51- 4.50	7	6	11	4	8	6	1	4	5	12	16	4	6	2	8	4	104
4.51- 5.50	5	6	13	12	2	1	1	0	7	8	8	2	1	0	1	3	70
5.51- 6.50	2	6	19	8	5	4	4	2	7	9	6	4	0	1	0	1	78
6.51- 8.50	0	7	14	12	8	8	3	2	9	7	10	1	0	1	0	0	82
8.51-11.50	1	1	4	18	19	11	3	4	3	3	6	2	1	0	0	1	77
11.51-14.50	0	0	2	9	22	2	0	1	1	2	9	3	1	2	2	0	56
14.51-20.50	0	0	1	9	9	1	0	0	0	0	5	2	2	3	1	1	34
>20.50	0	0	0	2	1	0	0	0	0	0	0	1	0	0	0	0	4
TOTAL	26	35	71	79	80	39	18	17	37	52	69	27	14	18	22	22	626

T FREQUENCY DISTRIBUTION ANALYSIS
IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 1/ 1/92 - 3/31/92

1ST-QTR-92

STABILITY CLASS E

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
1.51- 2.50	5	2	0	1	1	1	0	1	1	1	2	5	6	5	9	7	47
2.51- 3.50	6	4	3	2	0	2	1	0	1	0	5	7	5	5	12	7	60
3.51- 4.50	9	6	3	3	1	2	2	2	2	9	1	5	1	3	4	5	58
4.51- 5.50	7	5	4	3	1	1	3	0	4	4	0	2	2	2	1	0	39
5.51- 6.50	3	5	6	5	4	0	0	0	3	6	3	2	1	0	0	0	38
6.51- 8.50	0	6	5	9	8	1	0	9	9	7	10	3	2	2	1	3	75
8.51-11.50	0	2	4	6	10	8	2	13	5	0	4	1	2	0	0	1	58
11.51-14.50	0	0	3	6	5	1	0	5	2	2	6	1	1	1	0	1	34
14.51-20.50	0	0	0	11	9	1	1	0	1	3	1	1	1	3	3	2	37
>20.50	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	2
TOTAL	30	31	28	46	40	17	9	30	28	32	32	27	21	23	30	26	450

STABILITY CLASS F

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
MEASURED AT: 35.0 FEET
THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3
1.51- 2.50	8	1	2	1	1	0	0	0	3	1	4	2	3	4	5	6	41
2.51- 3.50	20	7	3	1	1	1	1	0	0	3	5	4	9	9	18	21	103
3.51- 4.50	15	7	5	0	0	0	0	0	0	3	2	0	4	7	14	12	69
4.51- 5.50	14	8	2	1	2	0	0	0	2	0	1	3	3	5	4	3	48
5.51- 6.50	5	6	4	1	1	0	0	0	4	1	2	4	5	1	1	2	37
6.51- 8.50	8	5	7	2	1	0	0	2	2	3	4	2	4	1	0	2	43
8.51-11.50	7	2	6	1	0	0	0	0	0	2	1	0	0	1	1	1	22
11.51-14.50	2	0	0	2	1	0	0	0	0	0	0	0	0	0	0	4	9
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	79	36	29	9	7	1	1	2	11	13	19	15	28	28	45	53	376

T FREQUENCY DISTRIBUTION ANALYSIS
IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 1/ 1/92 - 3/31/92

1ST-QTR-92

STABILITY CLASS G

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	1
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
1.51- 2.50	8	2	2	0	1	0	0	0	0	1	0	3	1	4	8	15	45
2.51- 3.50	29	13	1	1	1	1	0	0	1	1	2	3	3	7	24	31	118
3.51- 4.50	58	21	4	2	1	1	0	0	0	0	1	2	1	5	16	37	149
4.51- 5.50	44	29	8	2	0	0	0	0	1	0	1	1	1	1	12	24	124
5.51- 6.50	26	11	1	1	0	0	0	0	0	0	0	0	1	1	0	11	52
6.51- 8.50	27	19	6	1	0	0	0	0	1	1	0	0	0	0	1	4	60
8.51-11.50	15	19	4	4	0	0	0	0	0	0	0	0	0	0	0	1	43
11.51-14.50	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	211	116	27	11	3	2	0	0	3	3	4	9	7	19	61	123	600

STABILITY CLASS ALL

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
MEASURED AT: 35.0 FEET
THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	1
.76- 1.50	1	1	0	1	0	0	0	0	0	0	0	0	0	2	2	3	10
1.51- 2.50	24	7	5	3	4	2	2	2	4	4	7	10	10	18	28	30	160
2.51- 3.50	62	31	14	7	7	9	6	3	7	14	20	22	20	25	58	67	372
3.51- 4.50	89	40	24	9	10	9	3	6	7	24	20	11	12	17	42	58	381
4.51- 5.50	70	50	28	20	5	2	4	0	14	14	10	8	7	8	18	30	288
5.51- 6.50	36	28	32	16	11	4	4	2	16	16	13	10	7	3	1	14	213
6.51- 8.50	35	37	34	31	22	10	3	15	23	22	28	6	6	4	2	9	287
8.51-11.50	23	24	22	43	34	22	5	17	9	9	19	6	3	1	1	4	242
11.51-14.50	7	2	8	21	30	3	0	6	3	6	21	7	2	3	3	5	127
14.51-20.50	0	1	3	28	18	2	1	0	1	5	10	3	3	6	4	7	92
>20.50	1	0	0	3	2	0	0	0	0	0	0	1	0	1	0	0	8
TOTAL	348	221	170	182	143	63	28	51	84	114	148	84	70	88	159	227	2181

T FREQUENCY DISTRIBUTION ANALYSIS
IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 1/ 1/92 - 3/31/92

1ST-QTR-92

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH

TOTAL NUMBER OF OBSERVATIONS: 2184
TOTAL NUMBER OF VALID OBSERVATIONS: 2181
TOTAL NUMBER OF MISSING OBSERVATIONS: 3
PERCENT DATA RECOVERY FOR THIS PERIOD: 99.9 %
MEAN WIND SPEED FOR THIS PERIOD: 6.3 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
.28	1.79	3.85	28.70	20.63	17.24	27.51

DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	0	0	2	2	0	0	0	0	0	0	1	0	0	0	0	1	0
B	0	0	4	8	6	0	0	1	0	7	7	4	0	0	0	2	0
C	2	3	9	27	7	4	0	1	5	7	16	2	0	0	1	0	0
D	26	35	71	79	80	39	18	17	37	52	69	27	14	18	22	22	0
E	30	31	28	46	40	17	9	30	28	32	32	27	21	23	30	26	0
F	79	36	29	9	7	1	1	2	11	13	19	15	28	28	45	53	0
G	211	116	27	11	3	2	0	0	3	3	4	9	7	19	61	123	1
TOTAL	348	221	170	182	143	63	28	51	84	114	148	84	70	88	159	227	1

Table B2

JFDs of 35-Foot Wind Versus Delta T

April - June 1992

T FREQUENCY DISTRIBUTION ANALYSIS
IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 4/ 1/92 - 6/30/92

2ND-QTR-92

STABILITY CLASS A

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3
5.51- 6.50	0	0	0	0	0	0	0	2	1	2	2	0	0	0	0	0	7
6.51- 8.50	0	0	0	0	3	1	1	2	11	15	9	4	2	0	0	0	48
8.51-11.50	1	0	0	1	2	3	0	1	4	14	39	19	5	2	1	2	94
11.51-14.50	0	0	0	0	0	0	0	0	3	5	17	4	0	0	1	1	31
14.51-20.50	0	1	1	0	0	0	0	1	0	3	16	4	0	1	0	0	27
>20.50	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	4
TOTAL	1	1	1	1	5	4	1	6	19	42	85	31	8	4	2	3	214

STABILITY CLASS B

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	3
4.51- 5.50	2	0	0	1	1	0	1	0	4	3	3	2	0	1	0	0	18
5.51- 6.50	0	0	2	1	0	6	1	3	13	14	11	6	2	1	0	0	60
6.51- 8.50	2	1	1	1	7	4	10	4	22	13	17	3	3	1	0	1	90
8.51-11.50	0	0	1	2	4	4	1	0	2	4	6	4	3	1	0	0	32
11.51-14.50	0	0	0	0	1	0	0	0	0	1	5	2	0	0	0	1	10
14.51-20.50	0	0	0	0	0	0	0	0	0	2	3	3	0	0	0	0	8
>20.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TOTAL	4	1	4	5	13	14	13	7	42	38	47	20	8	4	0	2	222

T FREQUENCY DISTRIBUTION ANALYSIS
IDENTIFIER: PVNGS
PERIOD EXAMINED: 4/ 1/92 - 6/30/92

2ND-QTR-92

STABILITY CLASS C

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	1	2	0	1	1	3	3	1	0	0	3	0	0	15
4.51- 5.50	1	0	3	7	1	1	2	4	7	14	6	5	2	0	2	0	55
5.51- 6.50	0	0	1	0	0	3	5	9	18	13	7	5	1	1	0	1	64
6.51- 8.50	1	1	2	5	1	2	9	1	5	9	8	5	0	1	1	1	52
8.51-11.50	0	0	1	3	5	3	1	0	0	1	8	5	1	0	0	0	28
11.51-14.50	1	0	0	0	3	2	0	0	0	0	2	2	0	0	1	0	11
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	1	7	16	12	11	18	15	33	40	32	22	4	6	4	2	226

STABILITY CLASS D

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
MEASURED AT: 35.0 FEET
THRESHOLD AT: .75 MPH
INT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	2	3	0	0	1	0	1	1	1	4	4	1	0	2	3	0	23
2.51- 3.50	2	2	2	6	1	1	1	2	1	7	5	3	4	2	3	2	44
3.51- 4.50	4	4	7	5	2	5	2	4	4	9	5	2	0	0	1	2	56
4.51- 5.50	2	3	6	9	0	0	2	3	3	8	5	2	3	0	2	2	50
5.51- 6.50	0	1	9	5	2	0	0	0	3	1	5	4	1	0	1	0	32
6.51- 8.50	2	2	3	4	0	6	2	0	2	4	8	9	3	0	1	1	47
8.51-11.50	0	1	2	9	5	2	1	0	3	2	10	16	4	0	2	1	58
11.51-14.50	0	3	2	2	9	2	0	0	0	2	11	6	1	0	1	1	40
14.51-20.50	0	0	1	0	6	3	1	1	0	4	5	1	0	0	0	0	22
>20.50	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	12	19	33	40	27	19	10	11	17	41	58	44	16	4	14	9	374

[redacted]T FREQUENCY DISTRIBUTION ANALYSIS
[redacted]IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 4/ 1/92 - 6/30/92

2ND-QTR-92

STABILITY CLASS E

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
1.51- 2.50	0	0	2	1	0	0	0	1	0	0	1	0	3	1	1	6	16
2.51- 3.50	2	5	3	0	1	1	0	0	2	0	3	1	3	5	1	3	30
3.51- 4.50	3	3	1	2	0	0	0	0	2	2	2	1	3	1	0	3	23
4.51- 5.50	0	3	1	1	0	0	0	0	2	5	6	1	2	2	1	0	24
5.51- 6.50	2	4	0	2	0	0	1	1	2	6	6	4	1	3	1	1	34
6.51- 8.50	3	2	7	1	0	0	0	2	2	10	17	19	5	0	2	2	72
8.51-11.50	0	1	3	10	2	4	5	2	1	6	24	23	6	1	3	2	93
11.51-14.50	0	1	1	7	18	4	0	2	0	4	13	7	0	0	2	1	60
14.51-20.50	0	0	1	1	18	5	4	0	0	0	4	0	0	0	2	2	37
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	10	19	19	25	39	14	10	8	11	33	76	56	23	13	14	20	390

STABILITY CLASS F

[redacted]ABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
[redacted] MEASURED AT: 35.0 FEET
[redacted] THRESHOLD AT: .75 MPH
[redacted]INT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2
1.51- 2.50	2	3	0	0	0	1	0	0	0	0	0	1	3	2	3	2	17
2.51- 3.50	10	5	2	2	0	1	0	2	0	2	3	4	4	5	8	5	53
3.51- 4.50	7	2	2	0	0	0	0	0	0	3	5	7	7	6	6	3	48
4.51- 5.50	9	5	6	1	0	0	0	1	2	1	9	9	5	0	1	5	54
5.51- 6.50	5	4	0	1	0	0	1	2	0	4	10	7	4	2	1	2	43
6.51- 8.50	3	4	3	0	0	0	0	0	1	12	25	10	13	1	1	1	74
8.51-11.50	1	1	4	7	0	0	0	0	0	6	14	4	2	0	0	3	42
11.51-14.50	0	0	0	1	0	0	0	0	0	0	3	0	0	0	0	0	4
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	37	24	17	12	0	2	1	5	3	28	69	42	39	16	20	22	337

T FREQUENCY DISTRIBUTION ANALYSIS
IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 4/ 1/92 - 6/30/92

2ND-QTR-92

STABILITY CLASS G

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1.51- 2.50	3	1	2	0	0	0	0	0	0	0	0	2	2	2	3	4	19
2.51- 3.50	22	8	4	0	1	1	0	0	1	1	1	4	1	6	13	7	70
3.51- 4.50	39	16	2	1	3	0	0	0	2	1	2	1	8	2	8	33	118
4.51- 5.50	43	27	7	2	0	0	0	1	0	1	1	6	5	6	6	18	123
5.51- 6.50	17	16	2	0	0	0	0	0	0	2	2	1	1	3	0	4	48
6.51- 8.50	4	13	5	1	0	0	0	0	0	1	4	2	1	0	2	2	35
8.51-11.50	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	2	5
11.51-14.50	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	128	82	22	4	5	1	0	1	3	6	12	16	18	20	32	71	421

STABILITY CLASS ALL

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
MEASURED AT: 35.0 FEET
THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	4
1.51- 2.50	7	7	4	1	1	1	1	2	1	4	5	4	8	7	10	12	75
2.51- 3.50	36	20	11	8	3	4	1	4	4	10	12	12	12	18	25	17	197
3.51- 4.50	53	25	12	9	7	5	3	5	12	19	16	11	18	12	15	41	263
4.51- 5.50	57	38	23	21	2	1	5	9	18	32	32	25	18	9	12	25	327
5.51- 6.50	24	25	14	9	2	9	8	17	37	42	43	27	10	10	3	8	288
6.51- 8.50	15	23	21	12	11	13	22	9	43	64	88	52	27	3	7	8	418
8.51-11.50	2	4	11	32	18	16	8	3	10	33	103	71	21	4	6	10	352
11.51-14.50	1	4	3	10	31	8	0	2	3	12	51	21	1	1	5	5	158
14.51-20.50	0	1	3	1	24	8	5	2	0	9	28	8	0	2	2	2	95
>20.50	0	0	1	0	1	0	0	0	0	3	1	0	0	1	0	0	7
TOTAL	195	147	103	103	101	65	53	53	128	228	379	231	116	67	86	129	2184

T FREQUENCY DISTRIBUTION ANALYSIS
IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 4/ 1/92 - 6/30/92

2ND-QTR-92

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH

TOTAL NUMBER OF OBSERVATIONS: 2184
TOTAL NUMBER OF VALID OBSERVATIONS: 2184
TOTAL NUMBER OF MISSING OBSERVATIONS: 0
PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %
MEAN WIND SPEED FOR THIS PERIOD: 7.1 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
9.80	10.16	10.35	17.12	17.86	15.43	19.28

DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	1	1	1	1	5	4	1	6	19	42	85	31	8	4	2	3	0
B	4	1	4	5	13	14	13	7	42	38	47	20	8	4	0	2	0
C	3	1	7	16	12	11	18	15	33	40	32	22	4	6	4	2	0
D	12	19	33	40	27	19	10	11	17	41	58	44	16	4	14	9	0
E	10	19	19	25	39	14	10	8	11	33	76	56	23	13	14	20	0
F	37	24	17	12	0	2	1	5	3	28	69	42	39	16	20	22	0
G	128	82	22	4	5	1	0	1	3	6	12	16	18	20	32	71	0
TOTAL	195	147	103	103	101	65	53	53	128	228	379	231	116	67	86	129	0

Table B3

JFDs of 35-Foot Wind Versus Delta T

January - June 1992

T FREQUENCY DISTRIBUTION ANALYSIS
IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 1/ 1/92 - 6/30/92

1ST SEMIANNUAL

STABILITY CLASS A

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3
5.51- 6.50	0	0	0	0	0	0	0	2	1	2	2	0	0	0	0	0	7
6.51- 8.50	0	0	0	0	3	1	1	2	11	15	9	4	2	0	0	0	48
8.51-11.50	1	0	0	1	2	3	0	1	4	14	40	19	5	2	1	2	95
11.51-14.50	0	0	1	1	0	0	0	0	3	5	17	4	0	0	1	1	33
14.51-20.50	0	1	2	1	0	0	0	1	0	3	16	4	0	1	0	1	30
>20.50	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	4
TOTAL	1	1	3	3	5	4	1	6	19	42	86	31	8	4	2	4	220

STABILITY CLASS B

BILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
MEASURED AT: 35.0 FEET
THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	3
4.51- 5.50	2	0	0	1	1	0	1	0	4	3	3	2	0	1	0	0	18
5.51- 6.50	0	0	2	1	0	6	1	3	13	14	11	6	2	1	0	0	60
6.51- 8.50	2	1	1	1	11	4	10	5	22	14	19	3	3	1	0	1	98
8.51-11.50	0	0	3	4	5	4	1	0	2	6	9	7	3	1	0	0	45
11.51-14.50	0	0	1	2	2	0	0	0	0	3	6	3	0	0	0	1	18
14.51-20.50	0	0	1	4	0	0	0	0	0	4	4	3	0	0	0	2	18
>20.50	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TOTAL	4	1	8	13	19	14	13	8	42	45	54	24	8	4	0	4	261

T FREQUENCY DISTRIBUTION ANALYSIS
IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 1/ 1/92 - 6/30/92

1ST SEMIANNUAL

STABILITY CLASS C

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3.51- 4.50	0	0	1	1	2	0	1	1	3	3	1	0	0	3	0	0	16
4.51- 5.50	1	2	4	9	1	1	2	4	7	16	6	5	2	0	2	0	62
5.51- 6.50	0	0	3	1	1	3	5	9	20	13	9	5	1	1	0	1	72
6.51- 8.50	1	1	4	12	2	3	9	2	7	12	10	5	0	1	1	1	71
8.51-11.50	0	0	3	15	9	6	1	0	1	3	12	5	1	0	0	0	56
11.51-14.50	2	0	0	1	4	2	0	0	0	0	7	4	0	0	2	0	22
14.51-20.50	0	1	0	3	0	0	0	0	0	0	3	0	0	1	0	0	8
>20.50	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	5	4	16	43	19	15	18	16	38	47	48	24	4	6	5	2	310

STABILITY CLASS D

BILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
MEASURED AT: 35.0 FEET
THRESHOLD AT: .75 MPH
INT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	4
1.51- 2.50	5	5	1	1	2	1	3	2	1	5	5	1	0	7	9	2	50
2.51- 3.50	9	9	8	9	6	6	5	5	6	17	13	11	7	6	7	10	134
3.51- 4.50	11	10	18	9	10	11	3	8	9	21	21	6	6	2	9	6	160
4.51- 5.50	7	9	19	21	2	1	3	3	10	16	13	4	4	0	3	5	120
5.51- 6.50	2	7	28	13	7	4	4	2	10	10	11	8	1	1	1	1	110
6.51- 8.50	2	9	17	16	8	14	5	2	11	11	18	10	3	1	1	1	129
8.51-11.50	1	2	6	27	24	13	4	4	6	5	16	18	5	0	2	2	135
11.51-14.50	0	3	4	11	31	4	0	1	1	4	20	9	2	2	3	1	96
14.51-20.50	0	0	2	9	15	4	1	1	0	4	10	3	2	3	1	1	56
>20.50	0	0	1	2	2	0	0	0	0	0	0	1	0	0	0	0	6
TOTAL	38	54	104	119	107	58	28	28	54	93	127	71	30	22	36	31	1000

T FREQUENCY DISTRIBUTION ANALYSIS
IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 1/ 1/92 - 6/30/92

1ST SEMIANNUAL

STABILITY CLASS E

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3
1.51- 2.50	5	2	2	2	1	1	0	2	1	1	3	5	9	6	10	13	63
2.51- 3.50	8	9	6	2	1	3	1	0	3	0	8	8	8	10	13	10	90
3.51- 4.50	12	9	4	5	1	2	2	2	4	11	3	6	4	4	4	8	81
4.51- 5.50	7	8	5	4	1	1	3	0	6	9	6	3	4	4	2	0	63
5.51- 6.50	5	9	6	7	4	0	1	1	5	12	9	6	2	3	1	1	72
6.51- 8.50	3	8	12	10	8	1	0	11	11	17	27	22	7	2	3	5	147
8.51-11.50	0	3	7	16	12	12	7	15	6	6	28	24	8	1	3	3	151
11.51-14.50	0	1	4	13	23	5	0	7	2	6	19	8	1	1	2	2	94
14.51-20.50	0	0	1	12	27	6	5	0	1	3	5	1	1	3	5	4	74
>20.50	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	2
TOTAL	40	50	47	71	79	31	19	38	39	65	108	83	44	36	44	46	840

STABILITY CLASS F

BILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
MEASURED AT: 35.0 FEET
THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	2	5
1.51- 2.50	10	4	2	1	1	1	0	0	3	1	4	3	6	6	8	8	58
2.51- 3.50	30	12	5	3	1	2	1	2	0	5	8	8	13	14	26	26	156
3.51- 4.50	22	9	7	0	0	0	0	0	0	6	7	7	11	13	20	15	117
4.51- 5.50	23	13	8	2	2	0	0	1	4	1	10	12	8	5	5	8	102
5.51- 6.50	10	10	4	2	1	0	1	2	4	5	12	11	9	3	2	4	80
6.51- 8.50	11	9	10	2	1	0	0	2	3	15	29	12	17	2	1	3	117
8.51-11.50	8	3	10	8	0	0	0	0	0	8	15	4	2	1	1	4	64
11.51-14.50	2	0	0	3	1	0	0	0	0	0	3	0	0	0	0	4	13
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	116	60	46	21	7	3	2	7	14	41	88	57	67	44	65	75	713

[redacted]T FREQUENCY DISTRIBUTION ANALYSIS
[redacted]IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 1/ 1/92 - 6/30/92

1ST SEMIANNUAL

STABILITY CLASS G

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	1
.76- 1.50	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	2
1.51- 2.50	11	3	4	0	1	0	0	0	0	1	0	5	3	6	11	19	64
2.51- 3.50	51	21	5	1	2	2	0	0	2	2	3	7	4	13	37	38	188
3.51- 4.50	97	37	6	3	4	1	0	0	2	1	3	3	9	7	24	70	267
4.51- 5.50	87	56	15	4	0	0	0	1	1	1	2	7	6	7	18	42	247
5.51- 6.50	43	27	3	1	0	0	0	0	0	2	2	1	2	4	0	15	100
6.51- 8.50	31	32	11	2	0	0	0	0	1	2	4	2	1	0	3	6	95
8.51-11.50	15	20	4	4	0	0	0	0	0	0	2	0	0	0	0	3	48
11.51-14.50	4	2	1	0	0	0	0	0	0	0	0	0	0	1	0	1	9
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	339	198	49	15	8	3	0	1	6	9	16	25	25	39	93	194	1021

STABILITY CLASS ALL

[redacted]BILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
[redacted] MEASURED AT: 35.0 FEET
[redacted] THRESHOLD AT: .75 MPH
JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	1
.76- 1.50	1	1	0	1	1	0	0	0	0	0	0	0	1	2	3	4	14
1.51- 2.50	31	14	9	4	5	3	3	4	5	8	12	14	18	25	38	42	235
2.51- 3.50	98	51	25	15	10	13	7	7	11	24	32	34	32	43	83	84	569
3.51- 4.50	142	65	36	18	17	14	6	11	19	43	36	22	30	29	57	99	644
4.51- 5.50	127	88	51	41	7	3	9	9	32	46	42	33	25	17	30	55	615
5.51- 6.50	60	53	46	25	13	13	12	19	53	58	56	37	17	13	4	22	501
6.51- 8.50	50	60	55	43	33	23	25	24	66	86	116	58	33	7	9	17	705
8.51-11.50	25	28	33	75	52	38	13	20	19	42	122	77	24	5	7	14	594
11.51-14.50	8	6	11	31	61	11	0	8	6	18	72	28	3	4	8	10	285
14.51-20.50	0	2	6	29	42	10	6	2	1	14	38	11	3	8	6	9	187
>20.50	1	0	1	3	3	0	0	0	0	3	1	1	0	2	0	0	15
TOTAL	543	368	273	285	244	128	81	104	212	342	527	315	186	155	245	356	4365

[redacted]T FREQUENCY DISTRIBUTION ANALYSIS
[redacted]IDENTIFIER: PVNGS
DATA PERIOD EXAMINED: 1/ 1/92 - 6/30/92

1ST SEMIANNUAL

STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET
WIND MEASURED AT: 35.0 FEET
WIND THRESHOLD AT: .75 MPH

TOTAL NUMBER OF OBSERVATIONS: 4368
TOTAL NUMBER OF VALID OBSERVATIONS: 4365
TOTAL NUMBER OF MISSING OBSERVATIONS: 3
PERCENT DATA RECOVERY FOR THIS PERIOD: 99.9 %
MEAN WIND SPEED FOR THIS PERIOD: 6.7 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
5.04	5.98	7.10	22.91	19.24	16.33	23.39

DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	1	1	3	3	5	4	1	6	19	42	86	31	8	4	2	4	0
B	4	1	8	13	19	14	13	8	42	45	54	24	8	4	0	4	0
[redacted]	5	4	16	43	19	15	18	16	38	47	48	24	4	6	5	2	0
[redacted]	38	54	104	119	107	58	28	28	54	93	127	71	30	22	36	31	0
[redacted]	40	50	47	71	79	31	19	38	39	65	108	83	44	36	44	46	0
F	116	60	46	21	7	3	2	7	14	41	88	57	67	44	65	75	0
G	339	198	49	15	8	3	0	1	6	9	16	25	25	39	93	194	1
TOTAL	543	368	273	285	244	128	81	104	212	342	527	315	186	155	245	356	1

APPENDIX C

DOSE CALCULATIONS

GASEOUS EFFLUENT* DOSE CALCULATIONS

Doses to the maximum individual and the surrounding population resulting from the release of radioactive material in gaseous effluents from the Palo Verde Nuclear Generating Station were calculated using the GASPAR computer program. Gaseous effluents were released from Units 1, 2 and 3. The radionuclides considered in the dose calculations were Tritium, Iodine-131, Iodine-132, Iodine-133, Iodine-135, all noble gases, and particulates having a half-life greater than eight days and for which dose factors are contained in NUREG-0172. Strontium-89 and Strontium-90 were considered only through the first quarter since the second quarter results were not available. Locations selected for individual dose calculations included for each sector, the site boundary, and within five miles, if present, the nearest residence, the nearest garden, and the nearest milk animal. GASPAR implements the radiological dose models of Regulatory Guide 1.109 to determine the radiation exposure to man from four principal atmospheric exposure pathways: plume, ground deposition, inhalation, and ingestion. The ingestion pathways considered were cow milk, goat milk, meat, and vegetables. Doses to the maximum individual and the population were calculated as a function of age group and pathway for significant body organs. Assumptions and data sources used for input to the GASPAR code are described on page C7.

On April 13, 1992, the Energy Information Center opened to the public. This building replaced the former Visitors Center. Table C1 presents doses for both locations for comparison purposes. Future reports will only include doses at the Energy Information Center.

Table C1 presents the doses on a quarterly and semiannual basis for the Visitor Center and the Energy Information Center. An occupancy factor of 1.0 (implying continuous occupancy over the entire year) was considered for both the Visitor Center and Energy Information Center. The exposure pathways considered in dose calculations were: plume, ground deposition, and inhalation.

Table C2 presents the population doses.

Table C3 summarizes the individual doses and compares the result to PVNGS Technical Specification limits. The site boundary and residence locations for which data are presented represent the highest annual doses.

Based on results obtained by placing TLDs on the site boundary in each sector, the net dose for this report period, from direct-radiation, (plume and ground deposition) from all three units was determined to be zero.

* There were no liquid effluents associated with the operation of this facility.

Table C1

DOSES TO SPECIAL LOCATIONS FOR JANUARY - JUNE 1992

ENERGY INFORMATION CENTER LOCATED ONSITE 0.44 MILE S FROM UNIT 1, 0.29 MILE SSE FROM UNIT 2 AND 0.20 MILE ESE FROM UNIT 3

(MREM)	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
1ST QUARTER								
ADULT	5.73E-01	5.73E-01	3.36E-01	5.73E-01	5.74E-01	6.66E-01	5.74E-01	1.25E+00
TEEN	5.75E-01	5.75E-01	3.37E-01	5.75E-01	5.75E-01	6.89E-01	5.76E-01	1.25E+00
CHILD	5.47E-01	5.47E-01	3.37E-01	5.47E-01	5.48E-01	6.74E-01	5.48E-01	1.22E+00
INFANT	4.57E-01	4.57E-01	3.37E-01	4.58E-01	4.58E-01	5.75E-01	4.58E-01	1.13E+00
2ND QUARTER								
ADULT	6.15E-02	6.16E-02	2.55E-03	6.15E-02	6.15E-02	6.31E-02	6.20E-02	6.45E-02
TEEN	6.20E-02	6.21E-02	2.56E-03	6.20E-02	6.20E-02	6.39E-02	6.28E-02	6.50E-02
CHILD	5.51E-02	5.51E-02	2.58E-03	5.52E-02	5.52E-02	5.72E-02	5.58E-02	5.81E-02
INFANT	3.28E-02	3.28E-02	2.55E-03	3.28E-02	3.28E-02	3.47E-02	3.33E-02	2.69E-02
1ST SEMI-ANNUAL								
ADULT	6.35E-01	6.35E-01	3.39E-01	6.35E-01	6.35E-01	7.29E-01	6.36E-01	1.31E+00
TEEN	6.37E-01	6.37E-01	3.39E-01	6.37E-01	6.37E-01	7.53E-01	6.39E-01	1.32E+00
CHILD	6.02E-01	6.02E-01	3.39E-01	6.03E-01	6.03E-01	7.32E-01	6.04E-01	1.28E+00
INFANT	4.90E-01	4.90E-01	3.39E-01	4.91E-01	4.91E-01	6.09E-01	4.92E-01	1.16E+00

OLD VISITORS CENTER LOCATED ONSITE 0.45 MILE WNW FROM UNIT 1, 0.45 MILE NW FROM UNIT 2 AND 0.61 MILE NNW FROM UNIT 3

(MREM)	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
1ST QUARTER								
ADULT	2.76E-02	2.76E-02	1.78E-02	2.76E-02	2.76E-02	3.25E-02	2.76E-02	6.31E-02
TEEN	2.76E-02	2.76E-02	1.78E-02	2.76E-02	2.77E-02	3.37E-02	2.77E-02	6.32E-02
CHILD	2.65E-02	2.65E-02	1.79E-02	2.65E-02	2.65E-02	3.33E-02	2.66E-02	6.20E-02
INFANT	2.28E-02	2.28E-02	1.78E-02	2.28E-02	2.28E-02	2.90E-02	2.29E-02	5.83E-02
2ND QUARTER								
ADULT	4.45E-03	4.45E-03	3.87E-04	4.45E-03	4.45E-03	4.54E-03	4.48E-03	4.70E-03
TEEN	4.47E-03	4.48E-03	3.88E-04	4.48E-03	4.48E-03	4.59E-03	4.52E-03	4.72E-03
CHILD	4.00E-03	4.00E-03	3.89E-04	4.00E-03	4.00E-03	4.14E-03	4.05E-03	4.25E-03
INFANT	2.46E-03	2.46E-03	3.87E-04	2.46E-03	2.46E-03	2.59E-03	2.50E-03	2.71E-03
1ST SEMI-ANNUAL								
ADULT	3.20E-02	3.20E-02	1.82E-02	3.20E-02	3.20E-02	3.70E-02	3.21E-02	6.78E-02
TEEN	3.21E-02	3.21E-02	1.82E-02	3.21E-02	3.21E-02	3.83E-02	3.22E-02	6.79E-02
CHILD	3.05E-02	3.05E-02	1.82E-02	3.05E-02	3.05E-02	3.74E-02	3.06E-02	6.63E-02
INFANT	2.53E-02	2.53E-02	1.82E-02	2.53E-02	2.53E-02	3.16E-02	2.54E-02	6.11E-02

Table C2

INTEGRATED POPULATION DOSES FOR JANUARY - JUNE 1992

PERSONREM

JANUARY 1 - MARCH 31 1992

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	2.58E-01 10.41%	2.58E-01 10.41%	2.58E-01 99.59%	2.58E-01 10.41%	2.58E-01 10.41%	2.58E-01 9.19%	2.58E-01 10.41%	9.72E-01 30.50%
GROUND	6.47E-05 .00%	6.47E-05 .00%	6.47E-05 .02%	6.47E-05 .00%	6.47E-05 .00%	6.47E-05 .00%	6.47E-05 .00%	7.63E-05 .00%
INHAL	3.54E-01 14.29%	3.54E-01 14.28%	2.35E-04 .09%	3.54E-01 14.29%	3.54E-01 14.30%	4.46E-01 15.91%	3.54E-01 14.31%	3.53E-01 11.09%
VEGET	1.65E+00 66.87%	1.66E+00 66.86%	6.85E-04 .26%	1.66E+00 66.87%	1.66E+00 66.87%	1.87E+00 66.77%	1.65E+00 66.85%	1.65E+00 51.88%
COW MILK	1.29E-01 5.23%	1.29E-01 5.22%	6.09E-05 .02%	1.29E-01 5.23%	1.29E-01 5.23%	1.49E-01 5.30%	1.29E-01 5.23%	1.29E-01 4.06%
MEAT	7.91E-02 3.20%	7.97E-02 3.22%	1.37E-05 .01%	7.91E-02 3.20%	7.91E-02 3.20%	7.91E-02 2.82%	7.91E-02 3.20%	7.91E-02 2.48%
TOTAL	2.47E+00	2.48E+00	2.59E-01	2.48E+00	2.48E+00	2.80E+00	2.47E+00	3.19E+00
(a) PER CAPITA DOSE (REM)	1.26E-06	1.27E-06	1.32E-07	1.27E-06	1.27E-06	1.43E-06	1.26E-06	1.63E-06

APRIL 1 - JUNE 30 1992

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.75E-03 .17%	1.75E-03 .17%	1.75E-03 81.12%	1.75E-03 .17%	1.75E-03 .17%	1.75E-03 .17%	1.75E-03 .17%	7.66E-03 .76%
GROUND	2.97E-04 .03%	2.97E-04 .03%	2.97E-04 13.80%	2.97E-04 .03%	2.97E-04 .03%	2.97E-04 .03%	2.97E-04 .03%	3.50E-04 .03%
INHAL	2.60E-01 25.88%	2.60E-01 25.86%	7.52E-05 3.49%	2.60E-01 25.88%	2.60E-01 25.88%	2.64E-01 25.99%	2.61E-01 25.95%	2.60E-01 25.73%
VEGET	6.19E-01 61.66%	6.19E-01 61.65%	2.61E-05 1.21%	6.19E-01 61.65%	6.19E-01 61.65%	6.25E-01 61.58%	6.19E-01 61.60%	6.19E-01 61.29%
COW MILK	9.77E-02 9.73%	9.77E-02 9.73%	3.33E-06 .15%	9.77E-02 9.73%	9.77E-02 9.73%	9.86E-02 9.72%	9.77E-02 9.72%	9.77E-02 9.68%
MEAT	2.54E-02 2.53%	2.56E-02 2.55%	4.95E-06 .23%	2.54E-02 2.53%	2.54E-02 2.53%	2.54E-02 2.50%	2.54E-02 2.53%	2.54E-02 2.51%
TOTAL	1.00E+00	1.00E+00	2.16E-03	1.00E+00	1.00E+00	1.01E+00	1.00E+00	1.01E+00
(a) PER CAPITA DOSE (REM)	5.10E-07	5.10E-07	1.10E-09	5.10E-07	5.10E-07	5.16E-07	5.10E-07	5.16E-07

(a) PERSONREM DIVIDED BY 50-MILE POPULATION OF 1,796,000

Table C2 (Continued)

INTEGRATED POPULATION DOSES FOR JANUARY - JUNE 1992

PERSONREM

JANUARY 1 - JUNE 30 1992

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	2.59E-01 7.46%	2.59E-01 7.45%	2.59E-01 99.44%	2.59E-01 7.46%	2.59E-01 7.46%	2.59E-01 6.80%	2.59E-01 7.46%	9.80E-01 23.34%
GROUND	3.62E-04 .01%	3.62E-04 .01%	3.62E-04 .14%	3.62E-04 .01%	3.62E-04 .01%	3.62E-04 .01%	3.62E-04 .01%	4.26E-04 .01%
INHAL	6.13E-01 17.63%	6.13E-01 17.63%	3.10E-04 .12%	6.14E-01 17.64%	6.14E-01 17.64%	7.10E-01 18.59%	6.15E-01 17.67%	6.13E-01 14.61%
VEGET	2.27E+00 65.37%	2.27E+00 65.36%	7.11E-04 .27%	2.27E+00 65.37%	2.27E+00 65.36%	2.50E+00 65.39%	2.27E+00 65.34%	2.27E+00 54.14%
COW MILK	2.27E-01 6.53%	2.27E-01 6.52%	6.42E-05 .02%	2.27E-01 6.53%	2.27E-01 6.53%	2.47E-01 6.48%	2.27E-01 6.52%	2.27E-01 5.41%
MEAT	1.04E-01 3.00%	1.05E-01 3.03%	1.86E-05 .01%	1.04E-01 3.00%	1.05E-01 3.00%	1.05E-01 2.74%	1.04E-01 3.00%	1.04E-01 2.49%
TOTAL	3.48E+00	3.48E+00	2.61E-01	3.48E+00	3.48E+00	3.82E+00	3.48E+00	4.20E+00
(a) PER CAPITA DOSE (REM)	1.78E-06	1.78E-06	1.33E-07	1.78E-06	1.78E-06	1.95E-06	1.78E-06	2.14E-06

(a) PERSONREM DIVIDED BY 50-MILE POPULATION OF 1,796,000

Tabl[illegible]3

SUMMARY OF INDIVIDUAL DOSES FOR JANUARY - JUNE 1992

	Unit	Quarter #1	Quarter #2	Quarter #3	Quarter #4	Total for 1992
Gamma Air Dose	mrad	1.62E-01	1.04E-03	N/A	N/A	1.63E-01
T.S. 3.11.2.2 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% T.S. Limit	%	3.24E+00	2.08E-02	N/A	N/A	1.63E+00
Beta Air Dose	mrad	4.91E-01	1.59E-03	N/A	N/A	4.93E-01
T.S. 3.11.2.2 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% T.S. Limit	%	4.91E+00	1.59E-02	N/A	N/A	2.46E+00
Maximum Individual						
Total Body	mrem	9.56E-02	6.71E-04	N/A	N/A	9.63E-02
Skin	mrem	2.87E-01	1.71E-03	N/A	N/A	2.89E-01
Location						
Unit 1	miles	1.87 S	1.87 S	N/A	N/A	1.87 S
Unit 2	miles	1.68 S	1.68 S	N/A	N/A	1.68 S
Unit 3	miles	1.46 S	1.46 S	N/A	N/A	1.46 S
Maximum Organ Dose		Teen Thyroid	Child(1) Thyroid			Teen (1) Thyroid
(excluding skin)	mrem	9.00E-02	2.00E-02	N/A	N/A	1.02E-01
T.S. 3.11.2.3 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% T.S. Limit	%	1.20E+00	2.67E-01	N/A	N/A	6.80E-01
Location						
Unit 1	miles	5.05 S	2.67 ENE	N/A	N/A	5.05 S
Unit 2	miles	4.88 S	2.85 ENE	N/A	N/A	4.88 S
Unit 3	miles	4.67 S	2.99 ENE	N/A	N/A	4.67 S

Note 1 : Does not include 2nd quarter Sr-89,90 results

Note 2 : These control location doses are imparted via three principal atmospheric pathways: plume, ground exposure and inhalation. Technical Specification 3.11.4 has higher limits than Technical Specification 3.11.2.3, therefore the percent of limits are more conservative based on Technical Specification 3.11.2.3 than on Technical Specification 3.11.4.

DOSE CALCULATION MODELS

The GASPAR computer code was used to evaluate the radiological consequences of the routine release of gaseous effluents. GASPAR implements the dose calculational methodologies of Regulatory Guide 1.109, Revision 1.

Source terms for each quarter are combined with station-specific demographic data and each quarter's atmospheric diffusion estimates for gaseous dose calculations.

Atmospheric diffusion estimates are generated by the XOQDOQ computer code using onsite meteorological data as input. Doses for the semiannual period are the summation for the quarterly doses. Additional input to GASPAR includes the following site-specific data:

0 to 5 mile nearest residence, milk animal and garden in each of the 16 compass sectors, based on the 1991 Land Use Census.

0 to 5 mile population distribution based on the Land Use Census conducted during June-August, 1984.

The population distribution from the PVNGS UFSAR, Figure 2.1-8.

The population distribution of metropolitan Phoenix greater than 50 miles from PVNGS, based on the 1980 federal census results, is conservatively included in the 40 to 50 mile sectors (NE=123; ENE=140,097; E=621,130; ESE=8,392)

Absolute humidity of 6.0 g/m^3 from the PVNGS UFSAR, Table 2.3-16.

The fraction of the year that vegetables are grown (0.667) from the PVNGS ER-OL, Section 2.1.3.4, Table 2.1-8.

The fraction of daily feed derived from pasture while on pasture (0.35) and length of grazing season for milk animals beyond 5 miles (0.75) from the PVNGS ER-OL, Section 2.1.3.4.3.

The fraction of daily feed derived from pasture while on pasture (0.05) and length of grazing season for meat animals (0.25) from the PVNGS ER-OL, Section 2.1.3.4.4.

There were no milk animals located within 5 miles from the PVNGS during this reporting period.

Other values used for input to GASPAR are default values from Regulatory Guide 1.109, Revision 1.

APPENDIX D

REVISIONS TO THE JULY - DECEMBER 1991

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

This Appendix contains revisions to the July - December 1991 Semiannual Effluent Release Report. The corrections are denoted by the use of redline printing. Page C8 incorrectly referenced the 1989 Land Use Census. In addition, there were no milk animals located within 5 miles of PVNGS during 1991. These are word processing errors only. The actual calculations were performed using the data from the 1990 Land Use Census.

DOSE CALCULATION MODELS

The GASPAR computer code was used to evaluate the radiological consequences of the routine release of gaseous effluents. GASPAR implements the dose calculational methodologies of Regulatory Guide 1.109, Revision 1.

Source terms for each quarter are combined with station-specific demographic data and each quarter's atmospheric diffusion estimates for gaseous dose calculations.

Atmospheric diffusion estimates are generated by the XOQDOQ computer code using onsite meteorological data as input. Doses for the semiannual period are the summation for the quarterly doses. Additional input to GASPAR includes the following site-specific data:

0 to 5 mile nearest residence, milk animal and garden in each of the 16 compass sectors, based on the 1990 Land Use Census.

0 to 5 mile population distribution based on the Land Use Census conducted during June-August, 1984.

The population distribution from the PVNGS UFSAR, Figure 2.1-8.

The population distribution of metropolitan Phoenix greater than 50 miles from PVNGS, based on the 1980 federal census results, is conservatively included in the 40 to 50 mile sectors (NE=123; ENE=140,097; E=621,130; ESE=8,392)

Absolute humidity of 6.0 g/m^3 from the PVNGS UFSAR, Table 2.3-16.

The fraction of the year that vegetables are grown (0.667) from the PVNGS ER-OL, Section 2.1.3.4, Table 2.1-8.

The fraction of daily feed derived from pasture while on pasture (0.35) and length of grazing season for milk animals beyond 5 miles (0.75) from the PVNGS ER-OL, Section 2.1.3.4.3.

The fraction of daily feed derived from pasture while on pasture (0.05) and length of grazing season for meat animals (0.25) from the PVNGS ER-OL, Section 2.1.3.4.4.

There were no milk animals located within 5 miles from the PVNGS during this reporting period.

Other values used for input to GASPAR are default values from Regulatory Guide 1.109, Revision 1.