THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

PERRY NUCLEAR POWER PLANT
UNIT 1

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

1991: QUARTERS 3 & 4

Approved By:

Steven F. Kenneke SFK 2/28/92
Director, Perry Nuclear Engineering Dept.

2/24/92
General Manager, Perry Nuclear Power Plant

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INTRODUCTION

This Semiannual Radioactive Effluent Release Report (SRERR), covering the period of July 1 through December 31, 1991, is submitted in accordance with Section 6.9.1.7 of Appendix "A" (Technical Specifications) to Perry Nuclear Power Plant (PNPP) License No. NPF-58. It is designed to meet requirements of Regulatory Guide 1.21, as applicable to the PNPP Technical Specifications. Portions of the Technical Specifications applicable to this report, Sections 3/4.3.7.9, 3/4.3.7.10, 3/4.11, 3/4.12, 6.13.2, 6.14.2, and 6.15.1, are known as the Radiological Effluent Technical Specifications (RETS).

During quarters 3 and 4 the plant produced 4,848,750 Megawatt Hours Electric Gross. The net reactor capacity averaged 89.9 percent. The reactor was critical a total of 4127.1 hours.

Liquid and gaseous radioactive effluent releases to the environment during this reporting period were sampled and analyzed in accordance with the requirements of the Technical Specifications. All radioactive effluent releases were within the concentration and release limits specified in the RETS.

Calculations and terms utilized in this report are those outlined in the PNPP Offsite Dose Calculation Manual (ODCM).

The fourth quarter analysis results for Sr89/90 and Fe55 were not available for the generation of this report. An addendum will be generated when the results become available.

RADIOLOGICAL IMPACT ON MAN

Sampling and analysis of liquid and gaseous effluents were performed in accordance with the frequencies, types of analyses, and Lower Limits of Detection (LLD) outlined in the PNPP Unit 1 Technical Specifications.

Radioactive material was detected in some of the liquid and gaseous effluent samples analyzed. Dose calculations, using measured effluent flow and meteorological data, resulted in dose to individuals at levels below 10CFR20 and 10CFR50, Appendix I limits. Direct radiation resulting from plant operation, as measured by environmental thermoluminescent dosimeters located around the plant, did not contribute any measurable dose to members of the public for the reporting period and, as there are no other nearby fuel cycle sources, 40CFR190 limits were not exceeded.

Summaries of maximum individual and population doses resulting from liquid and gaseous radioactive effluent releases are given, in Regulatory Guide 1.21 format, in Attachment 1.

Technical Specification 6.9.1.7 requires assessment of radiation doses from radioactive liquid and gaseous effluent to members of the public while onsite. These onsite doses are assessed relative to offsite dose values, and are adjusted for appropriate dilution, dispersion, and occupancy factors.

ONSITE DOSE FOR LIQUID EFFLUENTS

The onsite liquid effluent pathway of concern for members of the public is shore exposure while fishing along the Lake Erie coast. Occupancy is assumed to be 60 hours per year and the dilution factor for the point of exposure is 10. Ratioing this exposure pathway to doses calculated for offsite locations yields the following onsite dose values.

	Total Body	Organ
Year 1991	4.1 E-01 mrem	2.2 E-03 mrem (skin)
Quarters 3 & 4	1.6 E-02 mrem	6.9 E-04 mrem (skin)
Quarter 3	6.0 E-03 mrem	2.2 E-04 mrem (skin)
Quarter 4	1.0 E-02 mrem	4.7 E-04 mrem (skin)

ONSITE DOSE FOR GASEOUS EFFLUENTS

Several cases are considered for onsite gaseous effluent exposure to members of the public including traversing a public road within the site boundary, shoreline fishing, non-plant related training, car pooling, and job interviews. The onsite activity with the highest dose potential, relative to gaseous effluents, is shoreline fishing. Occupancy is again assumed to be 60 hours per year. Accounting for this and the difference between annual average dispersion values for the onsite point of concern, 6.6 E-05 s/m^3, the following maximum onsite dose values are generated. The maximum onsite doses for gaseous effluents for the third and fourth quarter may not be cumulative.

	Total Body	Organ
Year 1991	5.6 E-03 mrem	2.1 E-01 mrem(thyroid)
Quarters 3 & 4	5.3 E-03 mrem	1.6 E-01 mrem(thyroid)
Quarter 3	1.8 E-03 mrem	1.4 E-01 mrem(thyroid)
Quarter 4	5.0 E-03 mrem	3.3 E-02 mrem(thyroid)

AVERAGE INDIVIDUAL TOTAL BODY DOSES

Average total body dose to individual members of the public is determined for the population that lives within fifty miles of the plant for gaseous effluents (2.42 E+06 persons) and the population that receives drinking water from intakes within fifty miles for liquid effluents (1.82 E+06 persons). These doses are calculated using the total population dose figures found in Attachment 1.

	Gases	Liquids
Year 1991	2.6 E-06 mrem	1.8 E-03 mrem
Quarters 3 & 4	1.5 E-06 mrem	8.8 E-05 mrem
Quarter 3	5.0 E-07 mrem	3.1 E-05 mrem
Quarter 4	1.1 E-06 mrem	5.6 E-05 mrem

Gaseous and Air Dose calculations at the site boundary were performed for two cases. Attachment 1 provides the calculated maximum site boundary dose values for all sectors including those sectors which are totally over water in which no member of the public resides (These are the W, WNW, NW, NNW, N AND NNE SECTORS). Attachment 2 provides the calculated maximum site boundary dose values for the land based sectors in which members of the public reside.

SUPPLEMENTAL INFORMATION

Regulatory Limits

Technical Specifications 3/4.11.1 and 3/4.11.2 outline requirements for release of radioactive liquid and gaseous effluents, respectively. Concentration of radioactive material in liquid effluents and dose or dose commitment resultant thereof are limited in unrestricted areas. Dose and dose rate due to radioactive materials released in gaseous effluents are limited in areas at or beyond the site boundary. Technical Specification limits are listed in Attachment 3.

Maximum Permissible Concentrations

The Maximum Permissible Concentrations (MPCs) in liquids are those outlined in Technical Specification 3.11.1.1 (10CFR20, Appendix B, Table II, Column 2, with the lower of the soluble and insoluble MPC being used; for dissolved and entrained noble gases, concentrations are limited to 2 E-04 μCi/ml). PNPP Unit 1 Technical Specifications do not contain a concentration requirement for gaseous releases, therefore, MPCs are not used to calculate maximum release rates for radioactive gaseous effluents.

Average Energy

Average energy requirements for radioactive effluent mixtures do not apply to PNPP Unit 1 Technical Specifications or Off-site Dose Calculation Manual.

Measurements and Approximations of Total Radioactivity

Analyses of specific radionuclides in effluent samples are used with effluent path flow measurements to evaluate the radioactive composition and concentration of effluents.

Batch Releases

Liquid effluent releases were considered continuous (runs of Emergency Service Water [ESW] Loops A and B) as well as batch (Liquid Radwaste [LRW] discharges). Although the ESW system is considered to be a continuous release path when in service, it is not run continuously.

All gaseous effluent releases from Perry Nuclear Power Plant were considered continuous.

LIQUID RELEASES

July 1 - September 30, 1991

	Batch	Continuous
Number of Releases	70	80
Total Time of Releases (min)	1.3 E+04	1.1 E+05*
Minimum Time for a Release (min)	1.0 E+00	2.2 E+01
Average Time for a Release (min)	1.9 E+02	1.4 E+03
Maximum Time for a Release (min)	2.3 E+02	3.7 E+04
Average Effluent Stream Flow During Periods of Release (l/min)	2.9 E+05	6.3 E+04

* - The total of ESW Loop A (3.6 E+04 min) and ESW Loop B (7.8 E+04 min)

October 1 - December 31, 1991

	Batch	Continuous
Number of Releases	65	76
Total Time of Releases (min)	1.3 E+04	6.3 E+04*
Minimum Time for a Release (min)	5.0 E+00	1.7 E+01
Average Time for a Release (min)	2.1 E+02	8.3 E+02
Maximum Time for a Release (min)	2.4 E+02	9.9 E+03
Average Effluent Stream Flow During Periods of Release (l/min)	2.5 E+05	6.1 E+04

* - The total of ESW Loop A (2.9 E+04 min) and ESW Loop B (3.4 E+04 min)

LIQUID EFFLUENTS

For the third quarter of 1991 there were 70 batch and 80 continuous releases. Batch release total waste volume for the third quarter was 7.8 E+06 liters; total continuous release waste volume was 1.4 E+09 liters; total plant discharge during periods of release was 2.6 E+10 liters.

For the fourth quarter of 1991 there were 65 batch and 76 continuous releases. Batch release total waste volume for the fourth quarter was 7.8 E+06 liters; total continuous release waste volume was 7.6 E+08 liters; total plant discharge during periods of release was 1.5 E+10 liters.

Summaries of the radionuclide total curie activities, average diluted concentrations, and percentage of MPC (in Regulatory Guide 1.21 format) are included in Attachment 4.

If a radionuclide was not detected, zero activity was used for that isotope in dose calculations. A zero activity indicates that the radionuclide was not present at a level greater than the Lower Level of Detection (LLD) of the instrumentation used. In all cases, these LLDs were less than the levels required by Technical Specifications. The following are typical LLDs.

Radionuclide	LLD (μCi/ml)
Mn-54	2.4 E-08
Fe-59	5.8 E-08
Co-58	1.9 E-08
Co-60	3.4 E-08
Zn-65	4.6 E-08
Mo-99	2.1 E-07
I-131	2.3 E-08
Cs-134	2.3 E-08
Cs-137	2.6 E-08
Ce-141	3.2 E-08
Ce-144	1.3 E-07
Sr-89	3.0 E-08
Sr-90	3.7 E-08
Fe-55	5.7 E-09
H-3	4.6 E-06
Gross Alpha	6.0 E-08

Estimates of error associated with sample analysis, discharge volume, and dilution volume follow. Analytical error terms are based on split sample analysis results, the majority of which are confirmatory measurements, the others are inter-laboratory comparison results. Discharge and dilution volume (flow rate instrumentation) error is assessed using loop instrumentation accuracy terms.

Gamma Analysis	10%
H-3 Analysis	8%
Sr-89/90 Analysis	10%
Fe-55 Analysis	21%
Gross Alpha Analysis	4%
Service Water Volume (Dilution)	31%
Emergency Service Water Volume (Discharge)	25%
Liquid Radwaste Volume	1%

GASEOUS EFFLUENTS

Summaries of the radionuclide total curie activities, average release rates (in Regulatory Guide 1.21 format) are included in Attachment 5.

If a radionuclide was not detected, zero activity was used for that isotope in dose calculations. A zero activity indicates that the radionuclide was not present at a level greater than the Lower Level of Detection (LLD) of the instrumentation used. In all cases, these LLDs were less than the levels required by Technical Specifications. The following are typical LLDs.

Radionuclide	LLD (μCi/ml)
Kr-87	1.7 E-08
Kr-88	2.3 E-08
Xe-133	1.8 E-08
Xe-133m	5.3 E-08
Xe-135	6.4 E-C
Xe-138	1.0 E-07
Mn-54	2.7 E-13
Fe-59	5.6 E-13
Co-58	3.2 E-13
Co-60	4.6 E-13
Zn-65	7.7 E-13
Mo-99	2.1 E-12
Cs-134	2.1 E-12
Cs-137	3.1 E-13
Ce-141	3.2 E-13
Ce-144	1.5 E-12
I-131	2.8 E-13
I-133	4.9 E-13
Sr-89	3.8 E-14
Sr-90	6.8 E-14
H-3	3.0 E-10
Gross Alpha	5.4 E-12

Estimates of error associated with sample analysis, sample flow rate, and effluent flow rate follow. Analytical error terms are based on split sample analysis results, the majority of which are confirmatory measurements, the others are interlaboratory comparison results. Flow rate instrumentation error is assessed using loop instrumentation accuracy terms.

Noble Gas Analysis	11%
Particulate Analysis	9%
Iodine Analysis	12%
H-3 Analysis	8%
Sr-89/90 Analysis	10%
Gross Alpha Analysis	4%
Sample Flow Rate	4%
Effluent Flow Rate	4%

SOLID WASTE

There were 56 radioactive waste shipments transported from PNPP for the period covered in this report. Five shipments of dry active waste were sent for compaction prior to burial (11,520 cubic feet). One shipment of dry active waste was shipped for direct burial (105 cubic feet). There were 51 dewatered liners (8766 cubic feet), which were sent in 48 separate shipments. Two dewatered HIC's, (264 cubic feet) were sent in 2 seperate shipments. There was no irradiated fuel transported from site. See Attachment 6 for volume and activity values.

METEOROLOGICAL DATA

Cumulative joint frequency distribution (JFD) tables of wind speed and direction for each stability class, as well as for all stability classes combined, are given in Attachment 7 for the annual and semiannual period and for each quarter of the semiannual period covered by this report.

These JFD tables are the results obtained from the processing of hourly average meteorological data collected at the PNPP [illegible] met tower. It should be noted that the 1-3 mph JFD [illegible]mn includes wind speeds down to 0.1 mph and that hours of [illegible]nd speed appear only in the totals columns. The separate [illegible]ies of periods of calm include wind speeds from 0.0 to <0.7 mph. Differential temperature (ΔT 60 - 10 meters) is generally used for atmospheric stability classification.

ABNORMAL RELEASES

There was one abnormal release during the reporting period.

On 12/22/91, as a result of an influx of water from the Circulating Water System pipe break, approximately 300 gallons of water with activity above environmental detection levels was discharged to the plant storm drains. The highest detectable activity levels were Co-60 at 1.46 E-6 uCi/ml and Mn-54 at 3.14 E-7 uCi/ml. The calculated doses for the event were 1.7E-05 mrem total body and 3.1E-05 mrem organ (GI-Tract). Low levels of activity were detected in the storm drain system which was cleaned as of 2/10/92. See Attachment 9.

APPLICABLE TECHNICAL SPECIFICATION REQUIREMENTS

Per PNPP Technical Specifications, certain noncompliance items, changes, and findings are reportable in the Semiannual Radioactive Effluent Release Report.

Radioactive Liquid Effluent Monitoring Instrumentation noncompliance (PNPP Technical Specification 3.3.7.9, Action b.):

There were no Liquid Effluent Monitoring Instrumentation noncompliances during the reporting period.

Radioactive Gaseous Effluent Monitoring Instrumentation noncompliance (PNPP Technical Specification 3.3.7.10, Action b.):

There was one case in which gaseous effluent monitoring instrumentation was not restored to an operable condition within the time required by Technical Specifications.

On May 10, 1991, a discrepancy between the indicated and actual flow for the Turbine Building/Heater Bay ventilation system was found and the monitor was declared inoperable. It was determined that the monitor had been inoperable during summer mode operations since 1988.

The pitot tube array, for the Turbine Building / Heater Bay ventilation system, will be calibrated during the third refueling outage. Until the calibration is complete, a default value of 345,000 cfm will be utilized during summer mode and 180,000 cfm during winter mode for dose calculations. Corrections for the dose calculations performed from 1988 through 1990, due to the inaccurate flow readings, have been completed. See Attachment 10.

Liquid Holdup Tanks noncompliance (PNPP Technical Specification 3.11.1.4, Action a.):

There were no outside temporary tanks containing radioactive liquid on the PNPP site during the reporting period.

Radiological Environmental Monitoring Program (REMP) changes (PNPP Technical Specification 3.12.1, Action c.):

For the reporting period, samples were obtained at their respective locations as required by the specified collection frequencies.

During the reporting period, vegetation sample location 48 was deleted due to the construction of a house at the sampling location. This change will be incorporated into the ODCM during the first reporting period of 1992.

Land Use Census findings (PNPP Technical Specification 3.12.2, Actions a and b.):

The 1991 Land Use Survey was conducted from August 13, 1991 to August 20, 1991 in accordance with 10 CFR 50 Appendix I and the PNPP Technical Specifications, Section 12. See Attachment 8.

Process Control Program (PCP) changes (PNPP Technical Specification 6.13.2):

There were no changes made to the Process Control Program during the reporting period.

Offsite Dose Calculation Manual (ODCM) changes (PNPP Technical Specification 6.14.2):

During the reporting period, no changes were made to the ODCM.

Major Changes to Radioactive Waste Treatment Systems (PNPP Technical Specification 6.15.1):

There were no major changes to radioactive waste treatment system during this reporting period.

Attachment 1

Radiological Impact on Man (Dose Summaries)

Attachment 1 (Page 1 of 4)

Radiological Impact on Man (Dose Summaries)

1991: Quarters 3 & 4

SUMMARY OF MAXIMUM INDIVIDUAL DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 91 7 1 1-91123124
GASEOUS 91 7 1 1-91123124
AIR 91 7 1 1-91123124

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST (M)	DIR (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MREM)
LIQUID	TOTAL BODY	2.37E-03	TEEN	RECEPTOR 1		7.9E-02	3.0E+00
LIQUID	LIVER	4.51E-03	TEEN	RECEPTOR 1		4.5E-	1.0E+01
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	7.65E-02		402.	NNE	7.7E-01	1.0E+01
NOBLE GAS	AIR DOSE (BETA-MRAD)	1.41E-01		402.	NNE	7.1E-01	2.0E+01
NOBLE GAS	T.BODY	4.73E-02	ALL	402.	NNE	9.5E-01	5.0E+00
NOBLE GAS	SKIN	1.18E-01	ALL	402.	NNE	7.8E-01	1.5E+01
IODINES& PARTICULATES	THYROID	1.39E+00	INFANT	273.	NW	9.2E+00	1.5E+01

SUMMARY OF POPULATION DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 91 7 1 1-91123124
GASEOUS 91 7 1 1-91123124

EFFLUENT	APPLICABLE ORGAN	ESTIMATED POPULATION DOSE (PERSON-REM)
LIQUID	TOTAL BODY	1.6E-01
LIQUID	THYROID	2.6E-02
GASEOUS	TOTAL BODY	3.7E-03
GASEOUS	THYROID	3.2E-01

Attachment 1 (Continued - Page 2 of 4)
Radiological Impact on Man (Dose Summaries)
91: Quarter 3

SUMMARY OF MAXIMUM INDIVIDUAL DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 91 7 1 1-91 93024
GASEOUS 91 7 1 1-91 93024
AIR 91 7 1 1-91 93024

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST (M)	DIR (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MREM)
LIQUID	TOTAL BODY	8.10E-04	ADULT	RECEPTOR 1		2.7E-02	3.0E+00
LIQUID	LIVER	1.84E-03	TEEN	RECEPTOR 1		1.5E-02	1.0E+01
NOBLE GAS	AIR DOSE (GAMMA MRAD)	2.44E-02		280.	NNW	2.4E-01	1.0E+01
NOBLE GAS	AIR DOSE (BETA-MRAD)	2.42E-02		280.	NNW	1.2E-01	2.0E+01
NOBLE GAS	T.BODY	1.47E-02	ALL	280.	NNW	2.9E-01	5.0E+00
NOBLE GAS	SKIN	3.46E-02	ALL	280.	NNW	2.3E-01	1.5E+01
IODINES PARTICULATES	THYROID	1.26E+00	INFANT	280.	NNW	8.4E+00	1.5E+01

SUMMARY OF POPULATION DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 91 7 1 1-91 93024
GASEOUS 91 7 1 1-91 93024

EFFLUENT	APPLICABLE ORGAN	ESTIMATED POPULATION DOSE (PERSON-REM)
LIQUID	TOTAL BODY	5.6E-02
LIQUID	THYROID	9.3E-03
GASEOUS	TOTAL BODY	1.2E-03
GASEOUS	THYROID	2.0E-01

Radiological Impact on Man (Dose Summaries)
1991: Quarter 4

SUMMARY OF MAXIMUM INDIVIDUAL DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 9110 1 1-91123124
GASEOUS 9110 1 1-91123124
AIR 9110 1 1-91123124

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST (M)	DIR (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MREM)
LIQUID	TOTAL BODY	1.59E-03	TEEN	RECEPTOR 1		5.3E-02	3.0E+00
LIQUID	LIVER	2.97E-03	TEEN	RECEPTOR 1		3.0E-02	1.0E+01
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	7.46E-02		402.	NNE	7.5E-01	1.0E+01
NOBLE GAS	AIR DOSE (BETA-MRAD)	1.38E-01		402.	NNE	6.9E-01	2.0E+01
NOBLE GAS	T.BODY	4.61E-02	ALL	402.	NNE	9.2E-01	5.0E+00
NOBLE GAS	SKIN	1.14E-01	ALL	402.	NNE	7.6E-01	1.5E+01
IODINE& PARTICULATES	THYROID	1.94E-01	INFANT	273.	NW	1.3E+00	1.5E+01

SUMMARY OF POPULATION DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 9110 1 1-91123124
GASEOUS 9110 1 1-91123124

EFFLUENT	APPLICABLE ORGAN	ESTIMATED POPULATION DOSE (PERSON-REM)
LIQUID	TOTAL BODY	1.0E-01
LIQUID	THYROID	1.6E-02
GASEOUS	TOTAL BODY	2.6E-03
GASEOUS	THYROID	4.0E-02

Attachment 1 (Continued - Page 4 of 4)
Radiological Impact on Man (Dose Summaries)
Year 1991

SUMMARY OF MAXIMUM INDIVIDUAL DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 91 1 1 1-91123124
GASEOUS 91 1 1 1-91123124
AIR 91 1 1 1-91123124

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST (M)	DIR (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MREM)
LIQUID	TOTAL BODY	5.63E-02	ADULT	RECEPTOR 1		1.9E+00	3.0E+00
LIQUID	LIVER	8.22E-02	TEEN	RECEPTOR 1		8.2E-01	1.0E+01
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	7.87E-02		402.	NNE	7.9E-01	1.0E+01
NOBLE GAS	AIR DOSE (BETA-MRAD)	1.44E-01		402.	NNE	7.2E-01	2.0E+01
NOBLE GAS	T.BODY	4.87E-02	ALL	402.	NNE	9.7E-01	5.0E+00
NOBLE GAS	SKIN	1.21E-01	ALL	402.	NNE	8.1E-01	1.5E+01
IODINES PARTICULATES	THYROID	1.84E+00	INFANT	283.	WNW	1.2E+01	1.5E+01

SUMMARY OF POPULATION DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 91 1 1 1-91123124
GASEOUS 91 1 1 1-91123124

EFFLUENT	APPLICABLE ORGAN	ESTIMATED POPULATION DOSE (PERSON-REM)
LIQUID	TOTAL BODY	3.2E+00
LIQUID	THYROID	6.3E-02
GASEOUS	TOTAL BODY	6.4E-03
GASEOUS	THYROID	4.8E-01

Attachment 2

Radiological Impact on Man (Land Based Sectors)

Attachment 2 (Page 1 of 2)
Radiological Impact on Man (Land Based Sectors)

Quarters 3 & 4

SUMMARY OF MAXIMUM INDIVIDUAL DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 91 1 1 1-91123124
GASEOUS 91 7 1 1-91123124
AIR 91 7 1 1-91123124

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST (M)	LOCATION DIR (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MREM)
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	2.48E-02		678.	NE	2.5E-01	1.0E+01
NOBLE GAS	AIR DOSE (BETA-MRAD)	4.00E-02		678.	NE	2.4E-01	2.0E+01
NOBLE GAS	T.BODY	1.53E-02	ALL	678.	NE	3.1E-01	5.0E+00
NOBLE GAS	SKIN	3.91E-02	ALL	678.	NE	2.6E-01	1.5E+01
IODINE& PARTICULATES	THYROID	8.69E-01	INFANT	678.	NE	5.8E+00	1.5E+01

Quarter 3

SUMMARY OF MAXIMUM INDIVIDUAL DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 91 1 1 1-91123124
GASEOUS 91 7 1 1-91 93024
AIR 91 7 1 1-91 93024

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST (M)	LOCATION DIR (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MREM)
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	2.07E-03		900.	WSW	2.1E-02	1.0E+01
NOBLE GAS	AIR DOSE (BETA-MRAD)	9.32E-04		900.	WSW	4.7E-03	2.0E+01
NOBLE GAS	T.BODY	1.12E-03	ALL	900.	WSW	2.2E-02	5.0E+00
NOBLE GAS	SKIN	2.01E-03	ALL	900.	WSW	1.3E-02	1.5E+01
IODINE& PARTICULATES	THYROID	8.59E-01	INFANT	900.	WSW	5.7E+00	1.5E+01

Attachment 2 (Page 2 of 2)
Radiological Impact on Man (Land Based Sectors)

Quarter 4

SUMMARY OF MAXIMUM INDIVIDUAL DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 91 1 1 1-91123124
GASEOUS 9110 1 1-91123124
AIR 9110 1 1-91123124

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST (M)	LOCATION DIR (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MREM)
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	2.45E-02		678.	NE	2.4E-01	1.0E+01
NOBLE GAS	AIR DOSE (BETA-MRAD)	4.76E-02		678.	NE	2.4E-01	2.0E+01
NOBLE GAS	T.BODY	1.51E-02	ALL	678.	NE	3.0E-01	5.0E+00
NOBLE GAS	SKIN	3.87E-02	ALL	678.	NE	2.6E-01	1.5E+01
IODINE& PARTICULATES	THYROID	6.82E-02	INFANT	678.	NE	4.5E-01	1.5E+01

Year 1991

SUMMARY OF MAXIMUM INDIVIDUAL DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 91 1 1 1-91123124
GASEOUS 91 1 1 1-91123124
AIR 91 1 1 1-91123124

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST (M)	LOCATION DIR (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MREM)
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	2.65E-02		678.	NE	2.6E-01	1.0E+01
NOBLE GAS	AIR DOSE (BETA-MRAD)	4.97E-02		678.	NE	2.5E-01	2.0E+01
NOBLE GAS	T.BODY	1.63E-02	ALL	678.	NE	3.3E-01	5.0E+00
NOBLE GAS	SKIN	4.16E-02	ALL	678.	NE	2.8E-01	1.5E+01
IODINE& PARTICULATES	THYROID	1.16E+00	INFANT	900.	WSW	7.7E+00	1.5E+01

Attachment 3

Technical Specification Limits

Attachment 3 (Page 1 of 1)
Technical Specification Limits

LIQUID EFFLUENTS:

→ Concentration ≤ 10CFR20 Appendix B, Table II, Column 2*	→ release rate limit TS 3.11.1.1
→ ≤ 1.5 mrem total body ≤ 5 mrem any organ	→ quarterly dose limit per TS 3.11.1.2
→ 3 mrem total body ≤ 10 mrem any organ	→ annual dose limit per TS 3.11.1.2

GASEOUS EFFLUENTS:

Noble Gases

→ ≤ 500 mrem/yr total body ≤ 3000 mrem/yr any organ	→ dose rate limit per TS 3.11.2.1
→ ≤ 5 mrad air gamma ≤ 10 mrad air beta	→ quarterly air dose limit per TS 3.11.2.2
→ ≤ 10 mrad air gamma ≤ 20 mrad air beta	→ annual air dose limit per TS 3.11.2.2

I-131, I-133, H-3, Particulates with Halflives >8 Days

→ ≤ 1500 mrem/yr any organ	→ dose rate limit per TS 3.11.2.1
→ ≤ 7.5 mrem any organ	→ quarterly dose limit per TS 3.11.2.3
→ ≤ 15 mrem any organ	→ annual dose limit per TS 3.11.2.3

* - Dissolved or entrained noble gas concentration is limited to ≤ 2 E-4 μCi/ml.

Attachment 4

Liquid Effluents

Attachment 4 (Page 1 of 2)
Liquid Effluents

QUARTER 3 : START DATE 91070101 END DATE 91073024
QUARTER 4 : START DATE 91100101 END DATE 91123124

EFFLUENT AND WASTE DISPOSAL REPORT

LIQUID EFFLUENTS -- SUMMATION OF ALL RELEASED

	UNITS	QUARTER 3	QUARTER 4
A. FISSION AND ACTIVATION PRODUCTS			
1. TOTAL RELEASE (EXCL. TRIT., GASES, ALPHA)	CI	2.08E-02	2.62E-02
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	7.05E-10	1.00E-09
3. PERCENT OF APPLICABLE LIMIT	%	0.00E100	0.00E100
B. TRITIUM			
1. TOTAL RELEASE	CI	3.04E100	3.52E100
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	1.16E-07	2.42E-07
3. PERCENT OF APPLICABLE LIMIT	%	3.87E-03	8.07E-03
C. DISSOLVED AND ENTRAINED GASES			
1. TOTAL RELEASE	CI	4.10E-02	2.10E-02
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	1.60E-09	1.44E-09
3. PERCENT OF APPLICABLE LIMIT	%	7.99E-04	7.21E-04
D. GROSS ALPHA RADIOACTIVITY			
1. TOTAL RELEASE	CI	7.51E-05	1.71E-04
E. VOLUME WASTE RELEASED (PRIOR TO DILUTION)	LITERS	5.24E109	2.76E109
F. VOLUME DILUTION WATER USED DURING PERIOD	LITERS	2.62E110	1.46E110

Attachment 4 (Continued - Page 2 of 2)
Liquid Effluents

QUARTER 3 : START DATE 91070101 END DATE 91093024
QUARTER 4 : START DATE 91100101 END DATE 91123124
DATE OF REPORT: FEB. 6, 1992
PREPARED BY:

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 3	CONTINUOUS MODE QUARTER 4	BATCH MODE QUARTER 3	BATCH MODE QUARTER 4
H3	CI	0.00E+00	0.00E+00	3.04E+00	3.52E+00
CR51	CI	0.00E+00	0.00E+00	2.27E-03	1.01E-02
MN54	CI	0.00E+00	0.00E+00	3.38E-04	8.83E-04
FE55	CI	0.00E+00	0.00E+00	1.01E-02	0.00E+00
CO57	CI	0.00E+00	0.00E+00	1.71E-04	5.39E-04
CO60	CI	0.00E+00	0.00E+00	4.73E-03	9.17E-03
ZN65	CI	0.00E+00	0.00E+00	2.01E-03	5.04E-03
SR89	CI	0.00E+00	0.00E+00	4.02E-04	0.00E+00
TC99M	CI	0.00E+00	0.00E+00	0.00E+00	6.58E-05
AG110M	CI	0.00E+00	0.00E+00	6.01E-04	6.65E-05
CS134	CI	0.00E+00	0.00E+00	4.53E-05	2.61E-05
CS137	CI	0.00E+00	0.00E+00	1.30E-04	3.74E-05
LA140	CI	0.00E+00	0.00E+00	0.00E+00	2.76E-04
TOTAL FOR PERIOD (ABOVE)	CI	0.00E+00	0.00E+00	3.04E+00	3.55E+00
XE133	CI	0.00E+00	0.00E+00	3.27E-04	2.01E-02
XE135	CI	0.00E+00	0.00E+00	4.15E-02	9.42E-04

Attachment 5

Gaseous Effluents

Attachment 5 (Page 1 of 2)
Gaseous Effluents

QUARTER 3 ; START DATE 91070101 END DATE 91093024
QUARTER 4 ; START DATE 91100101 END DATE 91123124

EFFLUENT AND WASTE DISPOSAL REPORT

GASEOUS EFFLUENTS -- SUMMATION OF ALL RELEASES

	UNITS	QUARTER 3	QUARTER 4
A. FISSION AND ACTIVATION GASES			
1. TOTAL RELEASE	CI	2.51E+00	9.17E+01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	3.15E-01	1.15E+01
3. PERCENT OF TECHNICAL SPECIFICATION LIMIT	%	0.00E+00	0.00E+00
B. IODINES			
1. TOTAL IODINE-131	CI	4.99E-03	4.86E-03
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	6.27E-04	6.11E-04
3. PERCENT OF TECHNICAL SPECIFICATION LIMIT	%	0.00E+00	0.00E+00
C. PARTICULATES			
1. PARTICULATES WITH HALF-LIVES >8 DAYS	CI	2.19E-04	4.25E-04
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	2.76E-05	5.34E-05
3. PERCENT OF TECHNICAL SPECIFICATION LIMIT	%	0.00E+00	0.00E+00
4. GROSS ALPHA RADIOACTIVITY	CI	6.62E-05	2.02E-05
D. TRITIUM			
1. TOTAL RELEASE	CI	0.00E+00	0.00E+00
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	0.00E+00	0.00E+00
3. PERCENT OF TECHNICAL SPECIFICATION LIMIT	%	0.00E+00	0.00E+00

Attachment 5 (Continued - Page 2 of 2)
Gaseous Effluents

QUARTER 3 : START DATE 91070101 END DATE 91093024
QUARTER 4 : START DATE 91100101 END DATE 91123124
DATE OF REPORT: FEB. 6, 1992
PREPARED BY:

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 3	CONTINUOUS MODE QUARTER 4	BATCH MODE QUARTER 3	BATCH MODE QUARTER 4
1. FISSION AND ACTIVATION GASES					
KR85M	CI	2.01E-02	6.18E-01	--------	--------
KR87	CI	0.00E+00	1.73E-01	--------	--------
KR88	CI	0.00E+00	4.31E-01	--------	--------
XE133M	CI	0.00E+00	1.22E+00	--------	--------
XE133	CI	3.73E-01	7.93E+01	--------	--------
XE135M	CI	5.06E-01	6.11E-01	--------	--------
XE135	CI	1.61E+00	9.16E+00	--------	--------
XE138	CI	0.00E+00	1.62E-01	--------	--------
TOTAL FOR PERIOD (ABOVE)	CI	2.51E+00	9.17E+01	--------	--------
2. IODINES					
I131	CI	4.99E-03	4.86E-03	--------	--------
I133	CI	1.21E-02	1.12E-02	--------	--------
* I132	CI	0.00E+00	3.53E-04	--------	--------
TOTAL FOR PERIOD (ABOVE)	CI	1.71E-02	1.64E-02	--------	--------
3. PARTICULATES					
SR89	CI	2.19E-04	0.00E+00	--------	--------
SR90	CI	8.27E-11	0.00E+00	--------	--------
* CS130	CI	0.00E+00	4.25E-04	--------	--------
TOTAL FOR PERIOD (ABOVE)	CI	2.19E-04	4.25E-04	--------	--------

Attachment 6

Solid Waste

Solid Waste

Solid Waste Shipped Offsite for Disposal During Period from July 1 to December 31, 1991

WASTE STREAM:
Resins, Filters, & Evap. Bottoms

Waste Class	Cu. Feet	Cu. Meters	Curies Shipped	% Error (Ci)
A	9037.0	255.7	6.31 E+02	± 25%
B	0	0	0	N/A
C	0	0	0	N/A
ALL	9037.0	255.7	6.31 E+02	± 25%

WASTE STREAM:
Dry Active Waste

Waste Class	Cu. Feet	Cu. Meters	Curies Shipped	% Error (Ci)
A	11625.0	329.0	7.16 E+00	± 25%
B	0	0	0	N/A
C	0	0	0	N/A
ALL	11625.0	329.0	7.16 E+00	± 25%

NOTE: 11520 cubic feet have been shipped for compaction. An 8 to 1 reduction factor is expected. In addition, 105 cubic feet were shipped for direct burial.

WASTE STREAM:
Irradiated Fuel

Waste Class	Cu. Feet	Cu. Meters	Curies Shipped	% Error (Ci)
A	0	0	0	N/A
B	0	0	0	N/A
C	0	0	0	N/A
ALL	0	0	0	N/A

WASTE STREAM:
Other Waste

Waste Class	Cu. Feet	Cu. Meters	Curies Shipped	% Error (Ci)
A	0	0	0	N/A
B	0	0	0	N/A
C	0	0	0	N/A
ALL	0	0	0	N/A

Solid Waste

Estimates of Major Radionuclides by Waste Type
WASTE TYPE: Resins, Filters, & Evap. Bottoms

Waste Class	Nuclide Name	Percent Abundance	Curies
A			
	Fe-55	57.401	3.62 E+02
	Co-60	18.092	1.14 E+02
	Zn-65	13.518	8.53 E+01
	Cr-51	2.848	1.80 E+01
	Mn-54	2.802	1.77 E+01
	Cs-137	1.631	1.03 E+01
	Cs-134	1.232	7.77 E+00
	H-3	0.672	4.24 E+00
	Ni-63	0.584	3.68 E+00
	C-14	0.190	1.20 E+00
	Sr-90	0.058	3.65 E-01
	Pu-241	0.050	3.15 E-01
	Ni-59	0.001	3.33 E-03
	Cm-242	0.000	1.62 E-05
	Tc-99	0.000	8.21 E-06
	I-129	0.000	0.00 E+00
	Nb-94	0.000	0.00 E+00

SOLID WASTE

WASTE TYPE: Dry Active Waste

Waste Class	Nuclide Name	Percent Abundance	Curies
A			
	Fe-55	85.489	6.12 E+00
	Co-60	8.962	6.41 E-01
	Mn-54	5.549	3.97 E-01
	C-14	0.000	1.95 E-01
	H-3	0.000	1.32 E-05
	Tc-99	0.000	1.39 E-06
	Cs-137	0.000	0.00 E+00
	Ni-63	0.000	0.00 E+00
	Sr-90	0.000	0.00 E+00
	Pu-241	0.000	0.00 E+00
	Cm-242	0.000	0.00 E+00
	I-129	0.000	0.00 E+00
	Nb-94	0.000	0.00 E+00
	Ni-59	0.000	0.00 E+00

Solid Waste Disposal Summary

No. of Shipments	Mode of Transportation	Destination
15	Truck	Barnwell
41	Truck	Richland
0	N/A	Beatty
3	Truck	SEG/Oakridge

Attachment 7

Meteorological Data

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 91070101-91123124
STABILITY CLASS: ALL DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	22	105	83	4	0	0	216
NNE	55	91	86	9	0	0	201
NE	28	93	78	12	0	0	214
ENE	63	93	55	16	0	0	227
E	118	58	5	0	0	0	183
ESE	157	55	16	1	0	0	233
SE	128	88	28	8	0	0	269
SSE	71	127	52	9	0	0	262
S	68	170	156	25	1	0	420
SSW	42	194	221	46	9	0	514
SW	24	105	165	104	1	0	399
WSW	29	63	89	75	4	7	267
W	15	79	186	60	10	4	355
WNW	17	89	123	24	3	0	256
NW	11	82	102	18	8	0	213
NNW	13	89	70	2	0	0	175
TOTAL	829	1592	1512	404	28	11	4404

PERIODS OF CALM(HOURS): 44
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 91070101-91123124
STABILITY CLASS: A DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	0	0	0	0	2
NNE	0	1	19	0	0	0	20
NE	0	0	8	7	0	0	15
ENE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	3	0	0	0	0	3
SE	2	0	0	0	0	0	2
SSE	0	3	0	0	0	0	3
S	0	0	1	0	0	0	1
SSW	0	0	0	0	0	0	0
SW	1	1	0	0	0	0	2
WSW	0	0	0	1	0	0	1
W	0	0	0	0	0	0	0
WNW	0	2	0	0	0	0	2
NW	0	1	0	0	0	0	1
NNW	0	0	0	0	0	0	0
TOTAL	3	14	28	8	0	0	54

PERIODS OF CALM(HOURS): 1
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91070101-91123124
STABILITY CLASS: B DT/D2
ELEVATION: SPEED:SPD10F DIRECTION:DIR10F LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	2	0	0	0	4
NNE	0	4	20	0	0	0	24
NE	0	3	10	2	0	0	15
ENE	1	1	2	3	0	0	7
E	0	1	0	0	0	0	1
ESE	1	0	0	0	0	0	1
SE	1	1	0	0	0	0	2
SSE	0	1	0	0	0	0	1
S	0	0	1	0	0	0	1
SSW	0	0	0	0	0	0	0
SW	0	2	1	0	0	0	3
WSW	0	1	1	2	0	0	4
W	0	0	5	1	0	0	6
WNW	0	0	5	0	0	0	5
NW	0	4	4	0	0	0	8
NNW	0	0	1	0	0	0	1
TOTAL	3	20	52	8	0	0	83

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91070101-91123124
STABILITY CLASS: C DT/D2
ELEVATION: SPEED:SPD10F DIRECTION:DIR10F LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	8	17	0	0	0	26
NNE	0	14	14	0	0	0	28
NE	0	5	14	1	0	0	20
ENE	0	4	4	2	0	0	10
E	0	2	1	0	0	0	3
ESE	0	0	0	1	0	0	1
SE	0	1	0	0	0	0	1
SSE	0	3	1	0	0	0	3
S	1	2	3	0	0	0	6
SSW	0	2	4	0	0	0	6
SW	0	0	4	5	0	0	9
WSW	1	0	2	5	0	1	9
W	0	1	28	7	0	0	36
WNW	0	2	40	0	0	0	42
NW	0	4	20	1	0	0	25
NNW	0	7	11	0	0	0	18
TOTAL	3	54	163	22	0	1	243

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 91070101-91123124
STABILITY CLASS: D DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	9	76	59	4	0	0	148
NNE	8	62	32	0	0	0	102
NE	6	64	44	2	0	0	116
ENE	20	36	40	11	0	0	107
E	10	19	3	0	0	0	33
ESE	4	6	9	0	0	0	19
SE	4	23	12	4	0	0	43
SSE	3	24	29	9	0	0	65
S	7	48	77	14	1	0	147
SSW	2	45	128	31	9	0	215
SW	1	33	124	98	1	0	257
WSW	8	28	73	60	4	6	179
W	8	60	146	50	10	4	278
WNW	3	77	67	24	3	0	174
NW	7	67	70	17	0	0	161
NNW	7	66	57	2	0	0	132
TOTAL	110	734	970	326	28	10	2179

PERIODS OF CALM(HOURS): 1
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 91070101-91123124
STABILITY CLASS: E DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	5	16	5	0	0	0	26
NNE	3	10	1	0	0	0	20
NE	10	18	2	0	0	0	31
ENE	13	45	9	0	0	0	67
E	22	33	1	0	0	0	56
ESE	19	19	7	0	0	0	45
SE	20	30	12	4	0	0	67
SSE	6	63	22	0	0	0	91
S	12	78	74	11	0	0	175
SSW	11	93	88	15	0	0	207
SW	10	57	36	1	0	0	104
WSW	12	31	13	7	0	0	63
W	4	17	7	2	0	0	30
WNW	6	8	11	0	0	0	25
NW	0	6	8	0	0	0	14
NNW	4	16	1	0	0	0	21
TOTAL	163	539	297	40	0	0	1042

PERIODS OF CALM(HOURS): 3
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 91070101-91123124
STABILITY CLASS: F DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND DIRECTION	WIND SPEED(MPH) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	5	1	0	0	0	0	6
NNE	3	0	0	0	0	0	3
NE	7	2	0	0	0	0	9
ENE	11	6	0	0	0	0	17
E	32	3	0	0	0	0	35
ESE	29	17	0	0	0	0	46
SE	13	31	1	0	0	0	45
SSE	18	25	0	0	0	0	43
S	14	32	0	0	0	0	46
SSW	9	43	1	0	0	0	53
SW	6	6	0	0	0	0	12
WSW	6	3	0	0	0	0	9
W	2	1	0	0	0	0	3
WNW	5	0	0	0	0	0	5
NW	3	0	0	0	0	0	3
NNW	1	0	0	0	0	0	1
TOTAL	163	170	2	0	0	0	338

PERIODS OF CALM(HOURS): 4
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 91070101-91123124
STABILITY CLASS: G DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND DIRECTION	WIND SPEED(MPH) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	3	0	0	0	0	0	4
NNE	3	0	0	0	0	0	4
NE	4	1	0	0	0	0	5
ENE	18	0	0	0	0	0	18
E	54	0	0	0	0	0	55
ESE	104	10	0	0	0	0	118
SE	88	13	0	0	0	0	107
SSE	44	9	0	0	0	0	56
S	34	10	0	0	0	0	44
SSW	20	12	0	0	0	0	33
SW	6	6	0	0	0	0	12
WSW	2	0	0	0	0	0	2
W	1	0	0	0	0	0	2
WNW	3	0	0	0	0	0	3
NW	1	0	0	0	0	0	1
NNW	1	0	0	0	0	0	2
TOTAL	384	81	0	0	0	0	465

PERIODS OF CALM(HOURS): 35
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

Joint Frequency Distribution Tables - 1991: Quarter 3

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91070101-91093024
STABILITY CLASS: ALL DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND DIRECTION	WIND SPEED(MPH) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	18	64	42	0	0	0	125
NNE	14	55	70	0	0	0	140
NE	15	69	37	11	0	0	124
ENE	45	53	30	3	0	0	131
E	86	37	0	0	0	0	123
ESE	130	37	3	0	0	0	171
SE	97	49	7	0	0	0	154
SSE	43	41	7	0	0	0	91
S	48	64	45	0	0	0	157
SSW	30	107	45	2	0	0	184
SW	20	49	29	3	0	0	101
WSW	18	38	43	15	0	0	114
W	10	51	131	18	0	0	211
WNW	13	47	87	5	0	0	152
NW	6	53	63	4	0	0	126
NNW	9	62	32	0	0	0	104
TOTAL	602	866	671	61	0	0	2208

PERIODS OF CALM(HOURS): 24
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91070101-91093024
STABILITY CLASS: A DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND DIRECTION	WIND SPEED(MPH) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	1	0	0	0	0	1
NNE	0	1	19	0	0	0	20
NE	0	0	7	6	0	0	13
ENE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	3	0	0	0	0	3
SE	2	0	0	0	0	0	2
SSE	0	0	0	0	0	0	0
S	0	0	1	0	0	0	1
SSW	0	0	0	0	0	0	0
SW	1	0	0	0	0	0	1
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
TOTAL	3	6	27	6	0	0	42

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

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91070101-91093024
STABILITY CLASS: B DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	2	0	0	0	4
NNE	0	4	20	0	0	0	24
NE	0	3	8	2	0	0	13
ENE	0	1	1	2	0	0	4
E	0	1	0	0	0	0	1
ESE	1	0	0	0	0	0	1
SE	1	0	0	0	0	0	1
SSE	0	1	0	0	0	0	1
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	5	1	0	0	6
WNW	0	0	4	0	0	0	4
NW	0	0	3	0	0	0	3
NNW	0	0	1	0	0	0	1
TOTAL	2	12	44	5	0	0	63

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

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91070101-91093024
STABILITY CLASS: C DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	6	14	0	0	0	21
NNE	0	14	14	0	0	0	28
NE	0	5	12	1	0	0	18
ENE	0	3	3	1	0	0	7
E	0	2	0	0	0	0	2
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	1	0	0	0	1
SSW	0	0	0	0	0	0	0
SW	0	0	1	0	0	0	1
WSW	0	0	2	1	0	0	3
W	0	0	27	6	0	0	33
WNW	0	0	34	0	0	0	34
NW	0	4	19	1	0	0	24
NNW	0	7	8	0	0	0	15
TOTAL	1	41	135	10	0	0	187

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

Joint Frequency Distribution Tables - 1991: Quarter 3

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91070101-91093024
STABILITY CLASS: D D1/D2
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	4	42	22	0	0	0	68
NNE	4	29	16	0	0	0	49
NE	4	34	8	2	0	0	48
ENE	7	14	18	0	0	0	39
E	2	10	0	0	0	0	12
ESE	2	4	0	0	0	0	6
SE	2	12	5	0	0	0	19
SSE	1	11	4	0	0	0	16
S	4	18	27	0	0	0	49
SSW	0	22	22	1	0	0	45
SW	1	15	13	3	0	0	32
WSW	3	17	31	9	0	0	60
W	4	35	93	10	0	0	142
WNW	0	42	40	5	0	0	87
NW	2	44	35	3	0	0	84
NNW	5	42	23	0	0	0	70
TOTAL	45	391	357	33	0	0	826

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

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91070101-91093024
STABILITY CLASS: E D1/D2
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	5	13	4	0	0	0	22
NNE	6	7	1	0	0	0	14
NE	4	15	2	0	0	0	22
ENE	11	28	8	0	0	0	47
E	17	22	0	0	0	0	39
ESE	13	13	3	0	0	0	29
SE	13	13	2	0	0	0	28
SSE	2	16	3	0	0	0	21
S	3	22	16	0	0	0	41
SSW	7	40	22	1	0	0	70
SW	6	25	15	0	0	0	46
WSW	8	19	10	5	0	0	42
W	4	15	6	1	0	0	26
WNW	5	5	9	0	0	0	19
NW	0	5	6	0	0	0	11
NNW	3	13	0	0	0	0	16
TOTAL	107	271	107	7	0	0	493

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

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 91070101-91093024
STABILITY CLASS: F DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	5	0	0	0	0	0	5
NNE	5	0	0	0	0	0	5
NE	6	2	0	0	0	0	8
ENE	10	6	0	0	0	0	16
E	18	2	0	0	0	0	20
ESE	23	13	0	0	0	0	36
SE	9	20	0	0	0	0	29
SSE	4	10	0	0	0	0	14
S	9	17	0	0	0	0	26
SSW	7	36	1	0	0	0	44
SW	6	3	0	0	0	0	9
WSW	5	2	0	0	0	0	7
W	1	1	0	0	0	0	2
WNW	5	0	0	0	0	0	5
NW	3	0	0	0	0	0	3
NNW	0	0	0	0	0	0	0
TOTAL	113	112	1	0	0	0	226

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

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 91070101-91093024
STABILITY CLASS: G DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	3	0	0	0	0	0	4
NNE	2	0	0	0	0	0	3
NE	1	0	0	0	0	0	1
ENE	17	0	0	0	0	0	17
E	49	0	0	0	0	0	49
ESE	91	4	0	0	0	0	96
SE	70	4	0	0	0	0	75
SSE	36	3	0	0	0	0	39
S	32	7	0	0	0	0	39
SSW	16	9	0	0	0	0	25
SW	6	6	0	0	0	0	12
WSW	2	0	0	0	0	0	2
W	1	0	0	0	0	0	1
WNW	3	0	0	0	0	0	3
NW	1	0	0	0	0	0	1
NNW	1	0	0	0	0	0	1
TOTAL	331	33	0	0	0	0	371

PERIODS OF CALM(HOURS): 22
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 0

Joint Frequency Distribution Tables - 1991: Quarter 4

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91100101-91123124
STABILITY CLASS: ALL DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	5	41	41	4	0	0	91
NNE	8	36	16	0	0	0	61
NE	13	34	41	1	0	0	90
ENE	18	40	25	13	0	0	96
E	32	21	5	0	0	0	60
ESE	27	18	13	1	0	0	62
SE	31	50	18	8	0	0	115
SSE	28	86	45	9	0	0	171
S	20	106	111	25	1	0	263
SSW	12	87	176	44	9	2	330
SW	4	56	136	101	1	3	298
WSW	11	25	46	60	4	7	153
W	5	28	55	42	10	4	144
WNW	4	42	36	19	3	0	104
NW	5	29	39	14	0	0	87
NNW	4	27	38	2	0	0	71
TOTAL	227	726	841	343	28	11	2196

PERIODS OF CALM(HOURS): 20
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91100101-91123124
STABILITY CLASS: A DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	1	1	0	0	2
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	3	0	0	0	0	3
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	1
SW	0	1	0	0	0	0	1
WSW	0	0	0	1	0	0	1
W	0	0	0	0	0	0	0
WNW	0	2	0	0	0	0	2
NW	0	1	0	0	0	0	1
NNW	0	0	0	0	0	0	0
TOTAL	0	8	1	2	0	0	12

PERIODS OF CALM(HOURS): 1
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

Joint Frequency Distribution Tables - 1991: Quarter 4

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91100101-91123124
STABILITY CLASS: B DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	2	0	0	0	2
ENE	1	0	1	1	0	0	3
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	1	0	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	0	1	0	0	0	1
SSW	0	0	0	0	0	0	0
SW	0	2	1	0	0	0	3
WSW	0	1	1	2	0	0	4
W	0	0	0	0	0	0	0
WNW	0	0	1	0	0	0	1
NW	0	4	1	0	0	0	5
NNW	0	0	0	0	0	0	0
TOTAL	1	8	8	3	0	0	20

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91100101-91123124
STABILITY CLASS: C DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	3	0	0	0	5
NNE	0	0	0	0	0	0	0
NE	0	0	2	0	0	0	2
ENE	0	1	1	1	0	0	3
E	0	0	1	0	0	0	1
ESE	0	0	0	1	0	0	1
SE	0	1	0	0	0	0	1
SSE	0	2	1	0	0	0	3
S	1	2	2	0	0	0	5
SSW	0	2	4	0	0	0	6
SW	0	0	3	5	0	0	8
WSW	1	0	0	4	0	1	6
W	0	1	1	1	0	0	3
WNW	0	2	6	0	0	0	8
NW	0	0	1	0	0	0	1
NNW	0	0	3	0	0	0	3
TOTAL	2	13	28	12	0	1	56

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

Joint Frequency Distribution Tables - 1991: Quarter 4

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91100101-91123124
STABILITY CLASS: D DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	5	34	37	4	0	0	80
NNE	4	33	16	0	0	0	53
NE	5	30	36	0	0	0	71
ENE	13	22	22	11	0	0	68
E	8	9	3	0	0	0	21
ESE	2	2	9	0	0	0	13
SE	2	11	7	4	0	0	24
SSE	2	13	25	9	0	0	49
S	3	30	50	14	1	0	98
SSW	2	23	106	30	9	0	170
SW	6	18	111	89	1	0	225
WSW	5	11	42	51	4	6	119
W	4	25	53	40	10	4	136
WNW	3	35	27	19	3	0	87
NW	5	23	35	14	0	0	77
NNW	2	24	34	2	0	0	62
TOTAL	65	343	613	293	28	10	1353

PERIODS OF CALM(HOURS): 1
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91100101-91123124
STABILITY CLASS: E DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	3	1	0	0	0	4
NNE	3	3	0	0	0	0	6
NE	6	3	0	0	0	0	9
ENE	2	17	1	0	0	0	20
E	5	11	1	0	0	0	17
ESE	6	6	4	0	0	0	16
SE	7	17	10	4	0	0	38
SSE	4	47	19	0	0	0	70
S	9	56	58	11	0	0	134
SSW	4	53	66	14	0	0	137
SW	4	32	21	1	0	0	58
WSW	4	12	3	2	0	0	21
W	0	2	1	1	0	0	4
WNW	1	3	2	0	0	0	6
NW	0	1	2	0	0	0	3
NNW	1	3	1	0	0	0	5
TOTAL	56	268	190	33	0	0	549

PERIODS OF CALM(HOURS): 2
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

Joint Frequency Distribution Tables - 1991: Quarter 4

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 91100101-91123124
STABILITY CLASS: F DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	1	0	0	0	0	0	1
ENE	1	0	0	0	0	0	1
E	14	1	0	0	0	0	15
ESE	6	4	0	0	0	0	10
SE	4	11	1	0	0	0	16
SSE	14	15	0	0	0	0	29
S	5	15	0	0	0	0	20
SSW	2	2	0	0	0	0	4
SW	0	3	0	0	0	0	3
WSW	1	1	0	0	0	0	2
W	1	0	0	0	0	0	1
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	1	0	0	0	0	0	1
TOTAL	50	58	1	0	0	0	112

PERIODS OF CALM(HOURS): 3
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 91100101-91123124
STABILITY CLASS: G DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
NE	1	1	0	0	0	0	2
ENE	1	0	0	0	0	0	1
E	5	0	0	0	0	0	5
ESE	13	6	0	0	0	0	19
SE	18	9	0	0	0	0	27
SSE	8	6	0	0	0	0	14
S	2	3	0	0	0	0	5
SSW	4	3	0	0	0	0	7
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
TOTAL	53	28	0	0	0	0	94

PERIODS OF CALM(HOURS): 13
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 12

Joint Frequency Distribution Tables - Year 1991

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91010101-91123124
STABILITY CLASS: ALL DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	37	199	156	22	0	0	415
NNE	41	183	155	1	0	0	380
NE	64	177	186	58	0	0	492
ENE	131	207	184	53	3	0	578
E	217	147	23	0	2	0	391
ESE	156	122	45	3	0	0	429
SE	190	160	60	47	0	0	466
SSE	121	203	103	30	0	0	460
S	117	271	236	43	3	0	670
SSW	78	348	361	91	11	2	893
SW	52	249	335	149	3	0	789
WSW	50	140	294	218	45	9	756
W	29	180	399	161	21	4	795
WNW	32	179	216	50	6	0	483
NW	27	170	181	34	6	0	426
NNW	29	150	137	4	0	0	322
TOTAL	1471	3073	3091	963	100	15	8745

PERIODS OF CALM(HOURS): 59
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 15

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91010101-91123124
STABILITY CLASS: A DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	2	0	0	0	4
NNE	0	1	22	0	0	0	23
NE	1	0	18	23	0	0	42
ENE	1	1	0	1	1	0	4
E	0	1	0	0	0	0	1
ESE	0	5	0	0	0	0	5
SE	2	1	0	1	0	0	4
SSE	0	3	0	0	0	0	3
S	0	0	1	0	0	0	1
SSW	0	0	1	0	0	0	2
SW	2	4	0	3	0	0	9
WSW	0	1	1	3	0	0	5
W	0	0	5	0	1	0	6
WNW	0	3	3	0	0	0	4
NW	1	5	1	0	0	0	7
NNW	1	1	0	0	0	0	2
TOTAL	8	27	53	31	2	0	122

PERIODS OF CALM(HOURS): 1
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 15

Joint Frequency Distribution Tables - Year 1991

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91010101-91123124
STABILITY CLASS: B DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	2	1	0	0	5
NNE	0	4	41	0	0	0	45
NE	1	4	27	13	0	0	45
ENE	2	3	3	4	1	0	13
E	1	3	1	0	0	0	5
ESE	1	1	0	0	0	0	2
SE	1	1	0	3	0	0	5
SSE	0	2	1	0	0	0	3
S	0	0	3	0	0	0	3
SSW	0	3	1	0	0	0	4
SW	0	3	7	0	0	0	10
WSW	0	1	5	8	1	0	15
W	0	3	15	17	4	0	39
WNW	1	1	13	2	0	0	17
NW	0	7	4	0	0	0	11
NNW	0	0	1	0	0	0	1
TOTAL	7	38	124	48	6	0	223

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 15

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91010101-91123124
STABILITY CLASS: C DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	12	26	1	0	0	40
NNE	0	20	38	0	0	0	58
NE	0	17	30	8	0	0	55
ENE	0	6	9	6	1	0	22
E	0	3	2	0	1	0	6
ESE	0	1	6	1	0	0	8
SE	0	2	1	4	0	0	7
SSE	0	5	3	1	0	0	9
S	1	4	8	0	0	0	13
SSW	0	6	5	0	0	0	11
SW	0	2	13	9	0	0	24
WSW	1	3	14	16	3	1	38
W	0	4	69	25	1	0	99
WNW	0	4	52	0	0	0	56
NW	0	9	35	2	0	0	46
NNW	0	8	18	0	0	0	26
TOTAL	3	106	329	73	6	1	518

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 15

Joint Frequency Distribution Tables - Year 1991

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91010101-91123124
STABILITY CLASS: D DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	10	155	121	20	0	0	314
NNE	15	116	69	1	0	0	200
NE	16	125	110	14	0	0	267
ENE	24	95	148	42	0	0	309
E	17	52	17	0	1	0	88
ESE	8	21	27	1	0	0	57
SE	6	39	34	32	0	0	111
SSE	7	40	66	21	0	0	134
S	10	79	117	29	2	0	235
SSW	6	81	207	65	10	1	370
SW	7	64	221	132	3	0	427
WSW	18	81	232	175	40	8	554
W	13	134	300	115	15	4	581
WNW	9	154	137	48	6	0	354
NW	11	142	133	32	6	0	324
NNW	15	121	116	4	0	0	256
TOTAL	202	1499	2054	729	83	13	4581

PERIODS OF CALM(HOURS): 1
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 15

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91010101-91123124
STABILITY CLASS: E DT/DZ
ELEVATION: SPEED:SPD10P DIRECTION:DIR10P LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	7	26	5	0	0	0	38
NNE	17	21	2	0	0	0	40
NE	14	27	3	0	0	0	44
ENE	27	86	23	0	0	0	136
E	42	70	2	0	0	0	114
ESE	29	51	12	0	0	0	92
SE	22	54	24	7	0	0	113
SSE	17	94	33	8	0	0	152
S	28	129	107	16	1	0	281
SSW	30	184	146	26	1	1	389
SW	21	158	94	5	0	0	278
WSW	19	50	42	16	1	0	128
W	9	35	10	4	0	0	58
WNW	8	18	12	0	0	0	38
NW	7	14	8	0	0	0	29
NNW	9	20	2	0	0	0	31
TOTAL	311	1037	524	82	3	1	1961

PERIODS OF CALM(HOURS): 3
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 15

Joint Frequency Distribution Tables - Year 1991

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91010101-91123124
STABILITY CLASS: F DT/DZ
ELEVATION: SPEED:SPD10F DIRECTION:DIR10F LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	5	2	0	0	0	0	7
NNE	4	1	1	0	0	0	7
NE	14	3	1	0	0	0	18
ENE	30	12	1	0	0	0	43
E	51	16	0	0	0	0	67
ESE	44	32	0	0	0	0	76
SE	20	41	1	0	0	0	64
SSE	28	47	0	0	0	0	75
S	23	42	0	0	0	0	65
SSW	14	60	1	0	0	0	75
SW	14	12	0	0	0	0	26
WSW	9	4	0	0	0	0	13
W	4	3	0	0	0	0	7
WNW	8	0	0	0	0	0	8
NW	5	0	0	0	0	0	5
NNW	2	0	0	0	0	0	3
TOTAL	275	275	5	0	0	0	559

PERIODS OF CALM(HOURS): 5
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 15

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 91010101-91123124
STABILITY CLASS: G DT/DZ
ELEVATION: SPEED:SPD10F DIRECTION:DIR10F LAPSE:DT50M

WIND SPEED(MPH)

WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	6	0	0	0	0	0	7
NNE	5	0	0	0	0	0	7
NE	16	1	1	0	0	0	21
ENE	47	4	0	0	0	0	51
E	106	2	1	0	0	0	110
ESE	174	11	0	0	0	0	189
SE	134	28	0	0	0	0	162
SSE	69	12	0	0	0	0	84
S	55	17	0	0	0	0	72
SSW	28	14	0	0	0	0	42
SW	8	6	0	0	0	0	15
WSW	3	0	0	0	0	0	3
W	3	1	0	0	0	0	5
WNW	6	0	0	0	0	0	6
NW	3	1	0	0	0	0	4
NNW	2	0	0	0	0	0	3
TOTAL	665	91	2	0	0	0	781

PERIODS OF CALM(HOURS): 49
VARIABLE DIRECTION 0
HOURS OF MISSING DATA: 15

Attachment 8

Annual Land Use Census

ANNUAL

LAND-USE SURVEY

1991

Prepared by: Brian Nyerges — Brian Nyerges — 9-9-91 — Date

Prepared by: Donna Tizzano — Donna Tizzano — 9-10-91 — Date

Prepared by: James Balstad — Jamie Balstad — 9.10.91 — Date

Reviewed by: J. Traverso — James Traverso — 9/13/91 — Date

Reviewed by: James Webb — James Webb — 9-11-91 — Date

PNPP 1991 Land Use Survey

INTRODUCTION

The 1991 Land Use Survey was conducted from August 13 to August 20, 1991. The survey was conducted in accordance with 10 CFR 50 Appendix I and the PNPP Technical Specifications, Section 12.

There are sixteen meteorological sectors which have their origin at the centerline of the Unit 1 and Unit 2 reactor buildings. The nearest residence, milk animal and garden were identified in each of these sectors where possible. This information is used in the assessment of potential radiological doses to the public. In addition, all produce growers, recreational areas, and public drinking water facilities within a five mile radius around the plant were identified to provide information for use in emergency planning.

METHOD

The survey was conducted by visual inspection while traveling over all major roads within a five mile radius of PNPP, referring to previous years' reports, and talking with local residents.

The dispersion and deposition values shown in the tables are taken from Appendix A of the PNPP Offsite Dose Calculation Manual (ODCM). These values represent the Seven-Site-Year annual average based on the onsite meteorological data base.

DISCUSSION AND RESULTS

Table 1 lists the nearest residence. The resident identified with the highest X/Q value was 3121 Center Road located in the S sector approximately 0.9 miles from the plant. This was the same resident identified in the 1990 Land Use Survey.

Again this year as in the 1990 survey, only two milk animals within the five mile radius were found. This is down from the four locations identified in 1989. The nearest milk animal, shown in Table 2, with the highest D/Q value was 2908 Antioch Rd. located approximately 1.3 miles ESE of the plant. This was the same location in the 1990 Land Use Survey. The only other location found for milk animals was 5485 River Road, which is located 4.6 miles from the plant in the SSE sector.

Table 3 lists the nearest gardens with a surface area equal to or greater than 500 square feet. The location with the highest D/Q value was 3121 Center Rd. located 0.9 miles from the plant in the S sector. The survey identified three new locations this year. They were 4591 Lockwood Road, 2600 Antioch Road, and 3424 Parmly Road. These gardens can be found approximately 1.1 miles ENE sector, 1.2 miles E sector and 1.0 miles WSW sector, respectively.

The produce growers are shown in Table 4. This table provides a more comprehensive listing of produce growers in the area other than the nearest gardens. A total of 28 produce growers were documented during the survey. This includes seven new producers in 1991.

Finally, Table 5 shows the recreational areas and public drinking water facilities in the five mile radius. This information will be useful for emergency planning in regard to evacuations and population dose assessment. There were no new recreational areas or public drinking water facilities identified.

The following general observations of current land use were made:

- Areas between 4 miles and 5 miles in the ENE, WSW, SW, and SSW sectors of the plant are highly populated residential areas.
- The area between 3 miles and 4 miles in the WSW sector is primarily heavy industrial.
- The land along Route 20 or North Ridge Road is used mainly for commercial operations.
- Commercial nurseries which provide a large variety of stock to both wholesale and retail markets make up the predominant land use for this area.
- The remaining area within the five mile radius of the plant is rural farm land with moderate to low population density.
- Only minor residential and commercial development has occurred over the past year.

CONCLUSION

It can be concluded from this survey that the land within the five mile radius of the plant has not changed significantly since the last year. The changes noted in this report can be considered minor and subject to normal fluctuations of land use and methodology.

TABLE 1: NEAREST RESIDENCE

Meteorological Sector (1)	Address of Location	Distance from PNPP	Chi/Q Value (Sec/m^3)	Map Locator
NE	4384 Lockwood Rd.	0.8 miles	2.17E-6	2
ENE	4602 Lockwood Rd.	1.0 miles	1.13E-6	4
E	2684 Antioch Rd.	1.1 miles	6.67E-7	15
ESE	2774 Antioch Rd.	1.2 miles	4.44E-7	23
SE	4495 N. Ridge Rd.	1.2 miles	3.89E-7	30
SSE	3119 Parmly Rd.	0.9 miles	1.89E-6	32
S	3121 Center Rd.	0.9 miles	2.25E-6	35
SSW	3850 Clark Rd.	0.9 miles	1.11E-6	41
SW	3440 Clark Rd.	1.2 miles	4.98E-7	47
WSW	2815 Perry Park	1.0 miles	1.72E-6	52

(1) Sectors which extend over Lake Erie include: W, WNW, NW, NNW, N, and NNE.

TABLE 2: NEAREST MILK ANIMAL

Meteorological Sector (1,2)	Address of Location	Distance from PNPP	D/Q Value per m^2	Map Locator
ESE	2908 Antioch Rd.	1.3 miles	2.97E-9	24
SSE	5485 River Road	4.6 miles	1.94E-10	34

(1) W, WNW, NW, NNW, N, and NNE sectors extend over Lake Erie.

(2) The NE, ENE, E, SE, S, SSW, SW, and WSW sectors have no milk-producing animals within 5 miles.

TABLE 3: NEAREST GARDEN

Meteorological Sector (1)	Address of Location	Distance from PNPP	D/Q Value per m^2	Map Locator
NE	4398 Lockwood Rd.	0.8 miles	1.09E-8	3
ENE	4591 Lockwood Rd.*	1.1 miles	4.77E-9	5
E	2600 Antioch Rd.*	1.2 miles	4.56E-9	16
ESE	2774 Antioch Rd.	1.2 miles	3.41E-9	23
SE	4613 N. Ridge Rd.	1.2 miles	2.90E-9	31
SSE	3119 Parmly Rd.	0.9 miles	1.23E-8	32
S	3121 Center Rd.	0.9 miles	1.31E-8	35
SSW	3515 N. Ridge Rd.	1.7 miles	1.19E-9	42
SW	3440 Clark Rd.	1.2 miles	2.24E-9	47
WSW	3424 Parmly Rd.*	1.0 miles	5.44E-9	54

(1) W, WNW, NW, NNW, N, and NNE sectors extend over Lake Erie.

* Indicates a new location for 1991.

TABLE 4: PRODUCE GROWERS

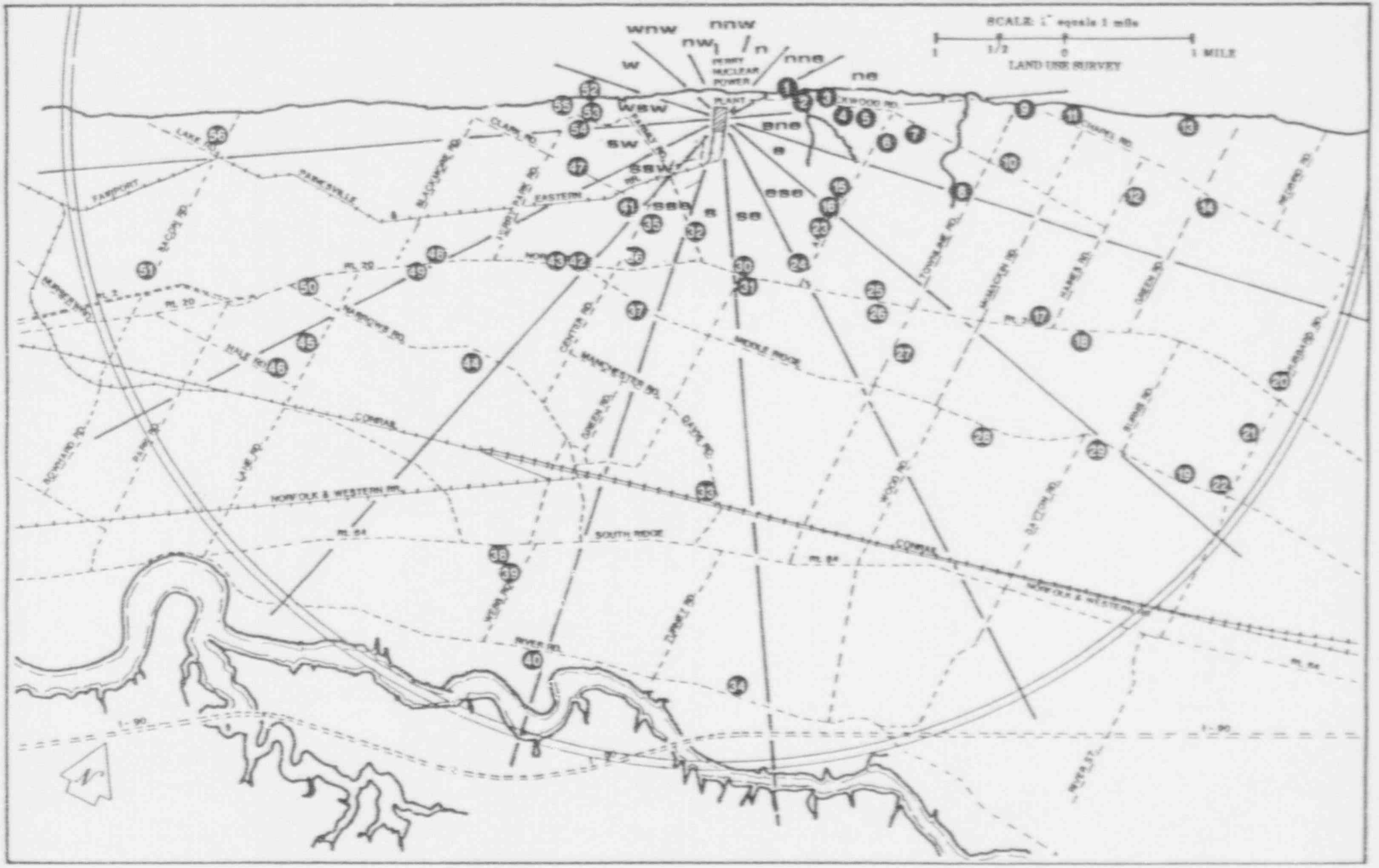
Name of Facility	Address of Location	Sector/ Distance	Map Locator
Shreve Farm	2431 Antioch Rd.	ENE 1.2 miles	6
Gerlica Farm	4860 Lockwood Rd.	ENE/1.5 miles	7
Rainbow Farms	Townline Road	ENE/1.9 miles	8
Twins Creek Farm	2299 Haines Road	ENE/3.2 miles	12
Orosz Farm*	2674 Antioch Road	E/1.2 miles	16
Sabo Farm	5674 North Ridge Rd.	E/2.9 miles	17
Resident	5814 North Ridge Rd.	E/3.3 miles	18
Woodworth Farm	Middle Ridge Road	E/4.6 miles	19
Wayman Farm Produce	Across from 2605 Hubbard Road	E/4.8 miles	20
Plant Pride Center	Intersection of Hubbard & Middle Ridge Road	E/4.9 miles	22
Resident	5009 North Ridge Rd.	ESE/1.8 miles	25
Secor Nursery	North Ridge Road	ESE/1.8 miles	26
Resident*	3815 Townline Road	ESE/2.3 miles	27
Resident*	5674 Middle Ridge Road	ESE/3.2 miles	28
Resident	6030 Middle Ridge Rd.	ESE/3.9 miles	29
Leekala Farm	4830 Davis Road	SSE/3.0 miles	33
Resident*	3269 Center Road	S/1.2 miles	36
Brookside Fruit Farm	Middle Ridge Road	S/1.7 miles	37
84 Garden Spot	South Ridge Road	S/3.8 miles	38
Resident*	4648 Webb Road	S/3.8 miles	39

Garden Center	Corner Narrows Rd. & North Ridge Rd.	SW/3.6 miles	41
Champion Nursery	North Ridge Road	SSW/1.8 miles	42
Golding Farm	North Ridge Road Perry Park Road	SSW/1.7 miles SW/1.5 miles	43
Resident*	3570 Narrows Road	NNW/ 2.8 miles	44
Resident*	4332 Lane Road	SSW/3.5 miles	45
Resident (Ermson)	2671 Hale	SSW/3.7 miles	46
Resident (Sasu)	3191 North Ridge Rd.	SW/2.4 miles	48
West Orchard Fruit Market	North Ridge Rd. Perry Park/Clark Rds.	SW/2.7 miles SW/1.6 miles	49

* Indicates a new location for 1991.

TABLE 5: RECREATIONAL AREAS & PUBLIC DRINKING WATER FACILITIES

Name of Facility	Address of Location	Sector/ Distance	Map Locator
North Perry Park	Lockwood Road	NE/0.7 miles	1
North Townline Park	Townline Road	ENE/2.3 miles	9
Lake Metro Park	Lockwood Road	ENE/1.7 miles	10
Camp Isaac Jogues	Chapel Road	ENE/3.2 miles	11
Tuttle Park	Tuttle Park Road	ENE/3.7 miles	13
Madison Country Club	Chapel/Green Roads	ENE/4.0 miles	14
Madison Village Water Plant	2934 Hubbard Road	E/4.8 miles	21
Lake County YMCA Outdoor Center	4540 River Road	S/4.6 miles	40
Fairway Pines Golf Course	Corner of Blase/ Nemeth and Bacon Rds.	SW/4.8 miles	51
Perry Township Park	Perry Park Road	WSW/1.1 miles	53
Camp Roosevelt	Perry Park Road	WSW/1.4 miles	55
Lake County Water Treatment Plant	Bacon Road	WSW/3.9 miles	56



Land Use Census Map

Attachment 9

Abnormal Release

EVENT DESCRIPTION

On 12/22/91,as a result of a Circulating Water System pipe break, an influx of water into the Unit 1 Intermediate Building 574' level created a situation which resulted in the eventual discharge of slightly contaminated water to the plant storm drains.

The level of water identified in the Intermediate Building (Int. Bldg) at its peak was 4 inches high. Using the standard engineering equation for flow through a submerged gate, with a 4" water column, the flowrate of water into the Unit 2 Auxiliary Building through a closed, 36" wide door with 1/4" clearance would be 80 gallons per minute.

The first indication of water in the Unit 1 Intermediate Bldg. was a high level alarm in the Floor Drain Sump at 0203; this will be considered the start of the event. At 0430, a Health Physics survey of Unit 2 found standing water in the Auxiliary Building, with no more water coming through the door from Unit 1; this will be considered the end of the event.

To maintain the Unit 2 buildings, temporary sump pumps were located in the building sumps. The Unit 2 Auxiliary Building (Aux. Bldg) sump contains a pump rated at 275 gallons per minute and it discharges to the Unit 2 Turbine Power Complex Sump when activiated by level switches. The Turbine Power Complex sump pump discharges to a roof drain on the Unit 2 Turbine Building, which drains to one of the South storm drains (S-4). This branch of the storm drains leads to the large sediment pond and eventually to Lake Erie. This is the path taken by the radioactive water from the Unit 2 Aux. Bldg. sump.

DETAILS OF CALCULATIONS

The activity level in the Unit 2 Aux. Bldg. sump was measured several times, the results of the highest survey identified Co-60 at 1.46 E-6 µCi/ml and Mn-54 at 3.14 E-7 µCi/ml.

The total volume of water discharged form the Unit 2 Aux. Bldg. sump is determined using the following facts and observations:

- personnel responsible for the upkeep of Unit 2 noted in interviews that the Aux. Bldg. sump routinely does not contain any water.

- the top of the Auxiliary Bldg. sump is flush with the floor; the floor has been laid to route most water leakage into the sump since there are no floor drains in the immediate area.

- the Aux. Bldg sump is a pit, approximately 12 ft. deep and 5.5 ft. square. It is physically divided into two sections, isolated from each other by a 10 ft. weir wall. As a result, two separate sumps are created within the Aux. Bldg. sump, the Equipment Drain Sump (EDS) anbd the Floor Drain Sump (FDS).

- a 275 gpm sump pump is located in each of the two sumps; the equipment drain sump pump is set up to discharge water to the floor drain side of the Aux. Bldg. sump, which discharges water through a fire hose to the Unit 2 Turbine Power Complex sump.

- the equipment drain sump pump appears to be inoperable. There was noted 95" of standing water in this sump, well above the float switch to energize the pump. In addition, the water on the equipment drain side was black in color, while the floor drain water was clear, indicating the two had not been mixed. The height of water found in the equipment drain sump is the benchmark for how high the water would have risen in the floor drain sump.

- a height of 95" in the floor drain sump equates to ~650 gallons (5 1/2' x 2' x 95"). This is the total volume collected in the floor drain side since the sump is normally empty.

- a height of 95" in the equipment drain sump equates to 1140 gallons (5 1/2' x 3 1/2' x 95").

- an estimate of ~100 gallons was left on the floor in the Unit 2 Aux. Bldg (20' x 30' x 1/4") which was eventually removed by decon crews.

- the total volume of water entering Unit 2 then is 100 + 1140 + 650 ≅ 2000 gallons.

- using the Engineering calculation of 80 gpm peak flow under the door between Unit 1 and Unit 2, the time duration to pass the estimated volume is ~30 minutes which is similar in duration to the time the Circulating Water pump(s) ran after the pipe break.

- the Unit 2 Aux. Bldg. sump was found to contain 52" of water remaining after securing the sump pump, which equates to ~360 gallons.

- thus 650 gallons input minus 360 gallons left ≅ 300 gallons discharged from the Unit 2 Aux. Bldg. Sump.

- individuals removing the water left in both sides of the Aux. Bldg. sump after termination of the event indicated that about 2000 gallons were pumped to the Unit 1 Intermediate Bldg. Sump for processing through Rad Waste (based on time and pump rating). Using previous estimates, 1140 gal in equipment side + 360 gal left in floor drain side = 1500 gallons.

RADIOLOGICAL EFFECTS OF RELEASE/ FOLLOWUP

Samples of the Unit 2 Turbine Power Complex sump were obtained the day after the event and no detectable activity above the effluent LLD levels were found. Also, samples were obtained from the water leaving the storm sewers, sediment at the exit of the storm sewers, and water from the holding pond. These three samples were sent to the environmental laboratory for further analysis. Results are expected in 2 - 4 weeks.

The Unit 2 Aux. Bldg. sump pump would have discharged the 300 gallons at 275 gpm, a run time of slightly over 1 minute. This water goes to the Unit 2 Turbine Power Complex sump. There is constant leakage into this sump at 10 liters/ minute, which discharges approximately 1200 gallons about once per 8 hours. Therefore, the 300 gallons from Aux. Bldg is diluted to 1200 gallons of clean water, then discharged to the storm sewers and assumed to be in Lake Erie immediately. Assuming that the Turbine Power Complex sump is half full when the Aux. Bldg. sump pumps down at 0300, the start/end times for the release are

9112220500/9112220505 (Dec. 22, 1991 at 0500 to Dec. 22, 1991 at 0505). The radiological consequences of this release are minimal. The table below is presented for comparison to federal limits contained in Perry's Technical Specifications.

	Event (mrem)	Tech Spec limit (mrem)	% of Tech Spec limit
Total Body dose	0.000017	3.0	0.00057%
Organ dose	0.000031	10.0	0.00031%

CORRECTIVE ACTION

To prevent unmonitored releases through this path, the discharge hose from the Unit 2 Aux. Bldg. Floor Drain sump pump to the Unit 2 Turbine Power Complex Sump has been removed. This removes any connection between the Unit 2 Aux. Bldg. Sump and the environment. In addition, the storm drain system was cleaned as of 2/10/92.

Attachment 12
Form: OM12A: CHI-54-10

Abnormal Liquid Effluent Release Data Sheet

Start/End Dates 911222 0000 / 911226 0505 Release Volume 300 gal
Release No. 91-244A Dilution Volume 1200 gal

Source of Material See Attached

Remarks: Co60 1.46E-6 μCi/ml & Mn-54 7.14E-7 μCi/ml in Unit 2 Aux Bldg sump. This is diluted to 1500 gals in Unit 2 TBC sump and released to Environment via storm drain. MPC calculations uses diluted concentration

10CFR20 Compliance (TS 3.11.1.1)

Isotope	C_i (μCi/ml)	MPC_i	C_i/MPC_i	Curies Released
Co 60	3.65E-7	3E-5	0.012	1.66E-6
Mn^{54}	7.85E-8	1E-4	0.0008	3.57E-7
		$\Sigma C_i/MPC_i$ LIMIT ≤ 1	0.013	

10CFR50 App. I Compliance (TS.3.11.1.2)

	Total Body		Organ	
(mrem)	Dose	LIMIT	Dose	LIMIT
Release	1.76E-5	500*	3.1E-5	500*
Qtr Total	3.54E-4	1.5	2.4E-4	5.0
Ann Total	5.42E-2	3.0	7.97E-2	10.0

* EPA limit for abnormal liquid releases

Performed By _____ Date 12/28/91

Reviewed By _____ Date 1/2/92

```
SCHEDULING: ADD,REPL, OR DELETE LIQUID ISOTOPE RELEASES     MD1EB

ENTER: [PR]     PRINT
       [DE]     DELETE A RELEASE
       [ED]     EDIT EXISTING RELEASE DATA
       [AD]     ADD NEW ENTRY OF RELEASE DATA
       [LI]     LIST ACTIVE IDS
       [RETURN] EXIT
ED
ENTER: [XXXXXXXX] BATCH ID
       [RETURN]   GO BACK TO PREVIOUS OPTION
91-244A
ENTER: [OR]     ORIGINAL UNITS
       [CU]     CURIES
       [RETURN] GO BACK TO PREVIOUS OPTION
DATE: PERRY                  UNIT: UNIT 1            12/28/91 08:24


RELEASE START/END DATE: . . . . . 9112220500 / 9112220505
RELEASE POINT: . . . . . 1
BATCH ID: . . . . . 91-244A
TIME DELAY BEFORE RELEASE: (HOURS) . . . . . 0.0
WASTE DILUTION FLOW RATE (CFS) . . . . . 0.0
TANK VOLUME OF LIQUID EFFLUENT RELEASED(LITERS) .4.54E+03
TANK FLOW RATE (LITERS/MIN)  . . . . . 9.08E+02
RELEASE TYPE: . . . . . BATCH
Q VALUES IN UCI/ML:
MN54  : 7.85E-08  CO60  : 3.65E-07

EDIT OPTIONS

       [TV]     TANK VOLUME
       [TF]     TANK FLOW
       [TD]     TIME DELAY
       [DL]     DILUTION FLOW RATE
       [CB]     CONTINUOUS OR BATCH
       [IS]     ISOTOPIC VALUES
       [DT]     START AND END DATE
       [RP]     RELEASE POINT
       [BA]     BATCH ID
       [RETURN] GO BACK TO PREVIOUS PROMPT
```

SITE: [illegible] 12/28/91 08:25

USER: CA

SUMMARY OF MAXIMUM INDIVIDUAL DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 911222 5-911[illegible]22 5
GASEOUS 91 1 1 1-91121524
AIR 91 1 1 1-91121524

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST (M)	DIR (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MREM)
LIQUID	TOTAL BODY	1.70E-05	TEEN	RECEPTOR 1		5.7E-04	3.0E+00
LIQUID	GI-TRACT	3.10E-05	TEEN	RECEPTOR 1		3.1E-04	1.0E+01
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	6.04E-02		280.	NNW	6.0E-01	1.0E+01
NOBLE GAS	AIR DOSE (BETA-MRAD)	9.17E-02		402.	NNE	4.6E-01	2.0E+01
NOBLE GAS	T.BODY	3.80E-02	ALL	280.	NNW	7.6E-01	5.0E+00
NOBLE GAS	SKIN	9.62E-02	ALL	280.	NNW	6.4E-01	1.5E+01
IODINE& PARTICULATES	THYROID	1.82E+00	INFANT	283.	WNW	1.2E+01	1.5E+01

SUMMARY OF POPULATION DOSES
LAST ACCUMULATIONS FOR PERIODS:
LIQUID 91 1 1 1-91 63024
GASEOUS 91 1 1 1-91 63024

EFFLUENT	APPLICABLE ORGAN	ESTIMATED POPULATION DOSE (PERSON-REM)
LIQUID	TOTAL BODY	3.1E+00
LIQUID	THYROID	3.7E-02
GASEOUS	TOTAL BODY	2.6E-03
GASEOUS	THYROID	1.6E-01

****

END OF REPORT

LOGIN DONE
ENTER: [illegible] TASK OR FUNCTION CODE
[illegible] START OVER
[illegible] LAST TASK
[illegible] NEXT TASK
[illegible] MAIN MENU
[illegible] FUNCTION MENU
[illegible] CONTROL-Z EXIT

$

DATE OF REPORT: JAN. 2, 1992
PREPARED BY:

QUARTER 3 : START DATE 00000000 END DATE 00000000
QUARTER 4 : START DATE 91122205 END DATE 91122206

EFFLUENT AND WASTE DISPOSAL REPORT

LIQUID EFFLUENTS -- SUMMATION OF ALL RELEASES

	UNITS	QUARTER 3	QUARTER 4	EST. TOTAL ERROR, %
A. FISSION AND ACTIVATION PRODUCTS				
1. TOTAL RELEASE (EXCL. TRIT., GASES, ALPHA)	CI	0.00E+00	2.01E-06	1.00E+01
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	0.00E+00	4.43E-07	
3. PERCENT OF APPLICABLE LIMIT	%	0.00E+00	0.00E+00	
B. TRITIUM				
1. TOTAL RELEASE	CI	0.00E+00	0.00E+00	1.00E+01
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	0.00E+00	0.00E+00	
3. PERCENT OF APPLICABLE LIMIT	%	0.00E+00	0.00E+00	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	CI	0.00E+00	0.00E+00	1.00E+01
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	0.00E+00	0.00E+00	
3. PERCENT OF APPLICABLE LIMIT	%	0.00E+00	0.00E+00	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	CI	0.00E+00	0.00E+00	1.00E+01
E. VOLUME WASTE RELEASED (PRIOR TO DILUTION)	LITERS	0.00E+00	4.54E+03	1.00E+01
F. VOLUME DILUTION WATER USED DURING PERIOD	LITERS	0.00E+00	4.54E+03	1.00E+01

ENTER: [RETURN] CONTINUE, [SO] START OVER, [EX] TO EXIT

EFFLUENT AND WASTE DISPOSAL REPORT

LIQUID EFFLUENTS FOR RELEASE POINT: 1

QUARTER 3 : START DATE 00000000 END DATE 00000000
QUARTER 4 : START DATE 91122205 END DATE 91122206
DATE OF REPORT: JAN. 2, 1992
PREPARED BY:

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNITS	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
MN54	CI	--------	--------	--------	3.57E-07
CO60	CI	--------	--------	--------	1.66E-06
TOTAL FOR PERIOD (ABOVE)	CI	--------	--------	--------	2.01E-06

* DENOTES SUPPLEMENTAL ISOTOPES
ENTER: [RETURN] CONTINUE, [SO] START OVER, [EX] TO EXIT

Attachment 10

Gaseous Effluent Monitoring Noncompliance