*Union Electric*
*Callaway Plant*

PO Box 620
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April 27, 2001

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20556

Gentlemen: ULNRC-4465

**DOCKET NUMBER 50-483**
**UNION ELECTRIC COMPANY**
**CALLAWAY PLANT**
**FACILITY OPERATING LICENSE NPF-30**
**2000 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT**

Please find enclosed the 2000 Annual Radioactive Effluent Release Report for the Callaway Plant. This report is submitted in accordance with section 5.6.3 of the Technical Specification.

Sincerely,

for Alan C. Passwater
Manager, Corporate Nuclear Services

BFH/nls

Enclosure

IE48
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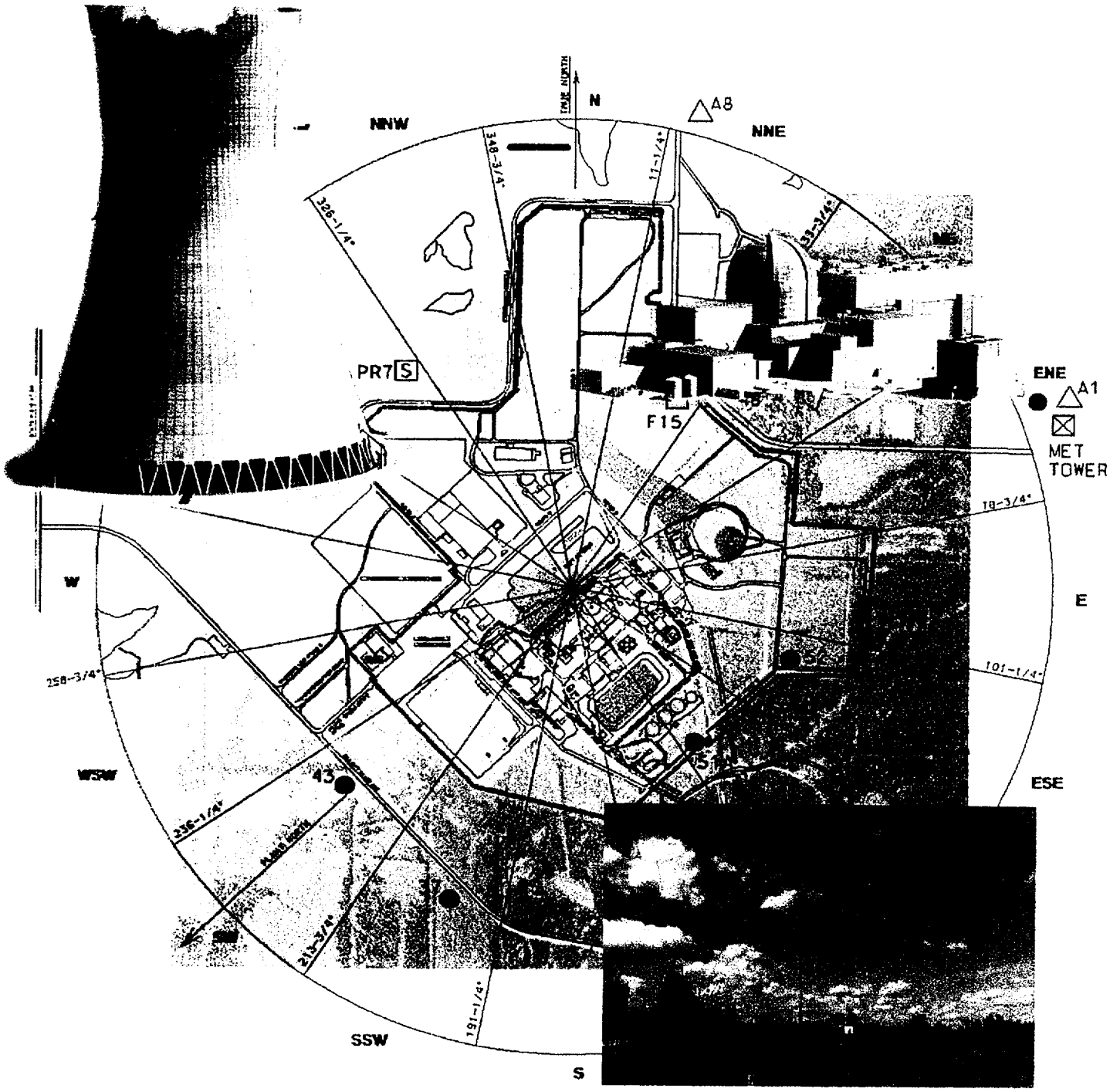
# 2000 Callaway Plant

## Radioactive Effluent Release Report

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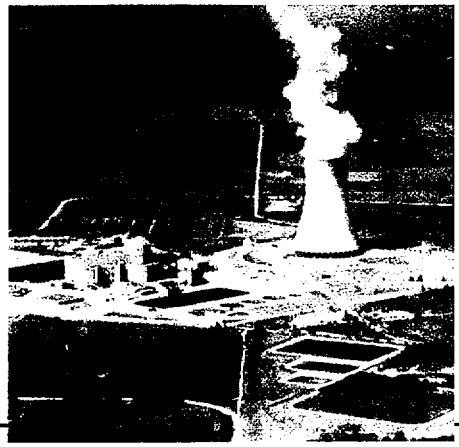
# 1.0 Introduction

*This report describes the Union Electric Co. Callaway Plant radioactive effluent releases for 2000. It is submitted in accordance with Section 5.6.3 of the Callaway Plant Technical Specifications.*

*A summary of radioactivity released in liquid and gaseous effluents and solid waste shipped from the Callaway Plant during the period from January 1, 2000 to December 31, 2000 is presented.*

*All liquid and gaseous effluents discharged during this reporting period complied with federal regulations and the limits in the Offsite Dose Calculation Manual (ODCM). Any exceptions are noted in this report.*



## 2.1 Regulatory Limits

The Radiological Effluent Control (REC) limits applicable to the release of radioactive material in liquid and gaseous effluents are provided below.

### Fission and Activation Gases (Noble Gases)

The dose rate due to radioactive noble gases released in gaseous effluents from the site to areas at and beyond the site boundary shall be limited to less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin.

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

a. During any calendar quarter: Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation and,

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

## Radioiodine, Tritium, And Particulates

The dose rate due to Iodine-131 and 133, tritium and all radionuclides in particulate form with half-lives greater than eight (8) days released in gaseous effluents from the site to areas at and beyond the site boundary shall be limited to less than or equal to 1500 mrem/yr to any organ.

The dose to a Member of the Public from Iodine-131 and 133, tritium, and all radionuclides in particulate form with half-lives greater than eight (8) days in gaseous effluents released to areas at and beyond the site boundary shall be limited to the following:

a. During any calendar quarter: Less than or equal to 7.5 mrem to any organ and,

b. During any calendar year: Less than or equal to 15 mrem to any organ.

### Liquid Effluent

The concentration of radioactive material released in liquid effluents to unrestricted areas shall be limited to ten times the concentrations specified in Appendix B, Table 2, Column 2 to 10CFR20 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2.0E-04 microcuries/ml total activity.

The dose or dose commitment to an Individual from radioactive materials in liquid effluents released to unrestricted areas shall be limited:

a. During any calendar quarter to less than or equal to 1.5 mrem to the total body and less than or equal to 5 mrem to any organ, and

b. During any calendar year to less than or equal to 3 mrem to the whole body and to less than or equal to 10 mrem to any organ.

### Uranium Fuel Cycle Sources

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 mrem to the total body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrem.

## 2.2 Average Energy

This requirement is not applicable to the Callaway Plant radiological effluent monitoring program since the release rate limits for fission and activation gases in gaseous effluent are not based on the average energy of the radionuclide mixture.

## 2.3 Measurements and Approximations of Total Radioactivity

Radionuclide concentrations in liquid and gaseous effluents were obtained by effluent sampling and radiological analysis in accordance with the requirements of Final Safety Analysis Report Table 16.11-1 and Table 16.11-4.

Gamma spectroscopy was the primary analysis technique used to determine the radionuclide composition and concentration of liquid and gaseous effluents. Composite samples were analyzed for Sr-89, Sr-90, Fe-55, and transuranic nuclides by an independent laboratory. Tritium and gross alpha were measured for both liquid and gaseous effluents using liquid scintillation counting and gas flow proportional counting techniques, respectively.

The total radioactivity in effluent releases was determined from the measured concentrations of each radionuclide present and the total volume of effluents discharged.

## 2.4 Batch Releases

Summary information relating to batch releases of gaseous and liquid effluents to the environment from the Callaway Plant during this year is presented below.

### Liquid

| | Units | Jan.-June | July-Dec. |
|---|---|---|---|
| Number of batch releases: | —— | 102 | 128 |
| Total time period for batch releases: | Minutes | 44,280 | 57,956 |
| Maximum time period for batch releases: | Minutes | 524 | 1,014 |
| Average time period for batch releases: | Minutes | 434 | 453 |
| Minimum time period for batch releases: | Minutes | 18 | 342 |
| Average Missouri River flow during periods of effluent release to the river[1]: | $ft^3/sec$ | 55,350 | 49,678 |

### Gaseous

| | Units | Jan.-June | July-Dec. |
|---|---|---|---|
| Number of batch releases: | —— | 44 | 34 |
| Total time period for batch releases: | Minutes | 2,379 | 2,488 |
| Maximum time period for batch releases: | Minutes | 472 | 506 |
| Average time period for batch releases: | Minutes | 54 | 73 |
| Minimum time period for batch releases: | Minutes | 7 | 18 |

[1] E-mail, S. Ternes, United States Department of the Interior - Geological Survey - Water Resources Division dated January 23, 2001

## 2.5 Abnormal Releases

LIQUID

Number of releases: 0

Total Activity released: 0

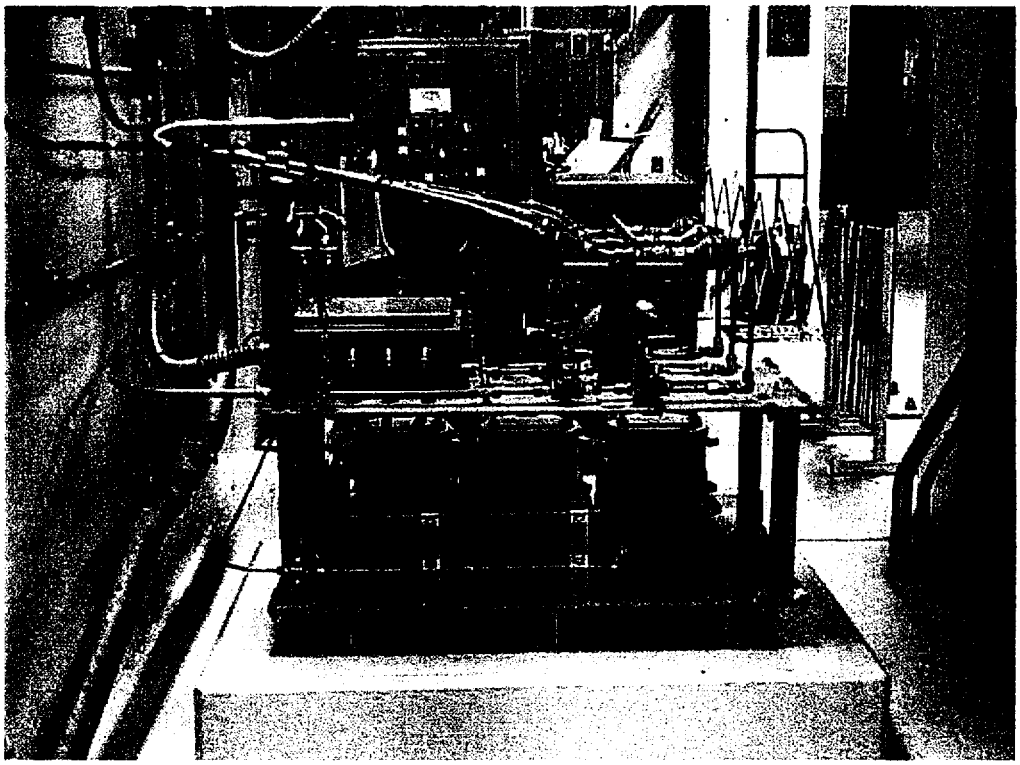
GASEOUS

Number of releases: 2

Total Activity released: 9.24 E-1 curies

# 3.0 *Summary of Gaseous Radioactive Effluents*

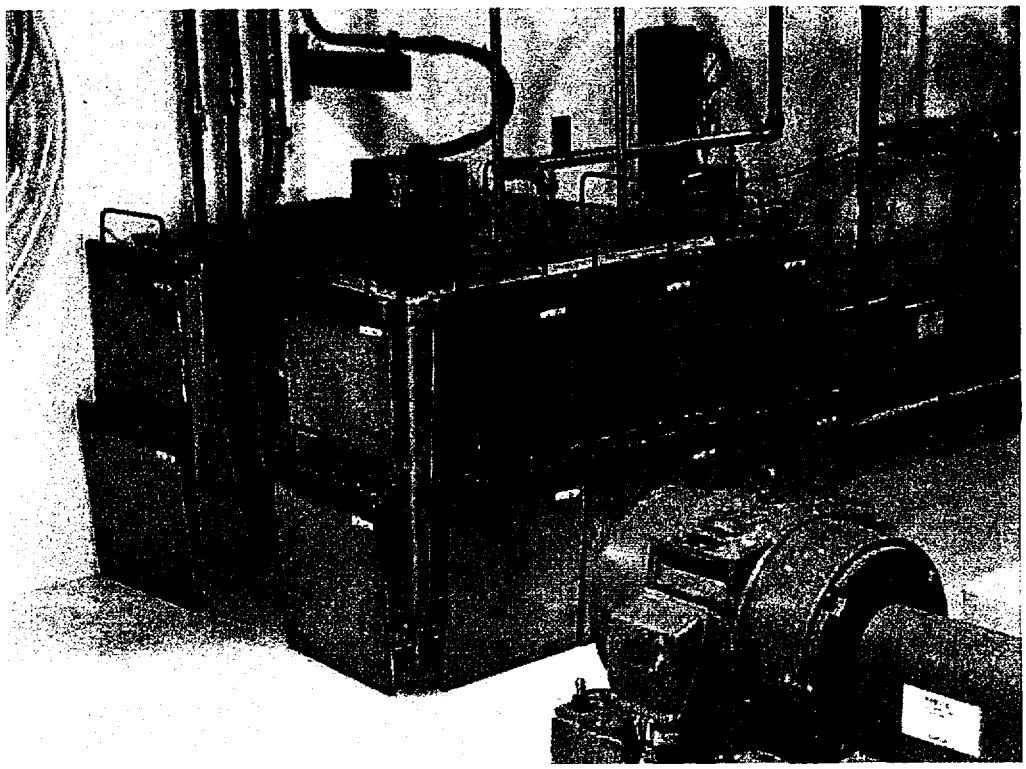
The quantity of radioactive material released in gaseous effluents during the year is summarized in Tables 1A and 1B. During 2000, all gaseous effluents were considered as ground level releases.



*Gaseous effluents from the plant are continuously monitored. Instrumentation provides on-line and grab sampling for iodine, particulates and noble gas.*

# 4.0 *Summary of Liquid Radioactive Effluents*

The quantity of radioactive material released in liquid effluents during the year is summarized in Tables 2A and 2B. During 2000, there was no continuous release of liquid effluent from the plant.



*Liquid effluents from the plant are continuously monitored. Shown is a liquid monitor shielded by lead to increase its sensitivity for sampling discharged water.*

## 5.0 Solid Wastes

The quantities of radioactive material released in shipments of solid waste for burial and irradiated fuel transported from the site during the year are summarized in Table 3. The total quantity and radioactivity reported in Table 3 for each waste type was for waste buried and includes wastes buried by waste reprocesses after volume reduction. The activity and fractional abundance of each nuclide was determined for each waste type based upon radiochemical analysis by an independent laboratory. The curie concentration of each nuclide listed in Table 3 was determined as the product of the fractional abundance and the total curies shipped. Those nuclides which comprise at least 1% of the total activity for a particular waste type are presented in Table 3.

## 6.0 Related Information

### 6.1 Unplanned Releases

**Unplanned releases are:**

1) Inadvertent or accidental releases of radioactive material.

2) Releases of radioactive material via normal pathways without a release permit, proper authorization, or proper sampling and analysis.

3) Releases which are conducted in such a manner as to result in significant deviation from the requirements of the release permit.

**Inadvertent Discharge of "A" Waste Gas Decay Tank During Discharge of "G" Waste Gas Decay Tank**

On January 21, 2000, discharge of Waste Gas Decay Tank (WGDT) "G" was terminated due to an Effluent Radiation Monitor alarm. A sample of "G" WGDT after the alarm indicated increased activity in the tank.

Investigation revealed valve leakage between "A" and "G" WGDT during the release allowed the transfer of gas. "A" WGDT was at a higher pressure and contained more activity then "G" WGDT.

Valve repairs, procedure improvements and training was performed to prevent future occurrence of this event. A description of this event is documented in the plant Corrective Action Program[1].

**Auxiliary Boiler Contamination**

On April 10, 1998, radioactivity was detected in the Auxiliary Boiler feed water system. The plant was performing a refueling outage during this time. The boiler was flushed and cleaned several times in an attempt to decontaminate the unit. Small amounts of contamination remained in the sludge. During subsequent operation of the boiler small amounts of contamination leached from the sludge and were detected in the boiler water.

An investigation was performed to locate the source of the contamination. No miss-positioned valves or leaks were identified. The results of sampling different system components were inconclusive, but may indicate a small leak in the SLWE heat exchanger. During

[1] CAR 200000135

refueling operations, the concentration of radioactive nuclides in the SLWE system can be a factor of 1000 higher then normal operations. The size of the leak may be small enough to only be recognized when these high concentrations are present. Increased monitoring was initiated in an attempt to identify the source of the contamination. No additional contamination was identified.

A 10CFR50.59 evaluation concluded that the resulting dose to a Member of the Public from the release of radioactive material to the environment would be a small fraction of the regulatory dose limits. Therefore, continued operation of the Auxiliary Boiler would not pose any significant safety or environmental concern.

The Auxiliary Boiler was operated intermittently during 2000. The maximum total body dose to a Member of the Public from these releases was 7.7E-04 mrem during 2000. This is negligible compared to the quarterly and annual effluent control limits. The activity released from the Auxiliary Boiler during 2000 is included in Tables 1A, 1B, 5, 6 and 7. A description of this event is documented in the plant Corrective Action Program[2]

[2] CAR 200000069

## 6.2 Changes to the Offsite Dose Calculation Manual

Revisions 10, 11 and 12 to APA-ZZ-01003, "Callaway Plant Off-Site Dose Calculation Manual were issued during 2000. The following changes were included in these revisions:

*Revision Number 10*

Section 3.1: Added explanation that GL-RE-202 only monitors particulate. Section 3.2: Changed Laundry Decon Facility Exhaust Monitor setpoint to less than or equal to 2000 cpm above equilibrium background with a maximum allowed background of 2000 cpm as calculated in HPCI 99-05. Tables 6.1, 6.2, 6.3: Updated values as calculated in HPCI 99-02. Section 5.1: Defined how REMP sample locations were determined. Removed reference to Plant Operating manual since it no longer exists.

*Revision Number 11*

Changes required going from old Technical Specifications to Improved Technical Specifications. Technical Specification 4.9.4.2 changed to FSAR SP 16.11.2.4.1.B. Technical Specification 6.8.4.F changed to FSAR SP 16.11.4. Technical Specification 6.8.1.F changed to Improved Technical Specification 5.4.1. Technical Specification 6.14 changed to Improved Technical Specification 5.5.1. Technical Specification 6.8.4.E changed to Improved Technical Specification 5.5.4. Technical Specification 6.9.1.6 changed to Improved Technical Specification 5.6.2. Technical Specification 6.9.1.7 changed to Improved Technical Specification 5.6.3. Changed name of Annual Radiological Effluent Release Report to Effluent Release Report as stated in ITS. Added liquid releases are limited to 10 times the Appendix B, Table 2, Column 2 limits per FSAR CN 98-041 supporting implementation of ITS.

*Revision Number 12*

Section 2.1 and 2.2.1: Updated 10CFR20, Appendix B, Table II, Column 2 reference to the new 10CFR20 format. Corrected typo for "f", flow setpoint should be undiluted waste flow rate. Section 3.2.1: Corrected typo, default value for safety factor should be 0.1. Section 5.1: Updated crosscheck program used to EML since EPA program is no longer available. Section 6.2: Added vertical height of highest adjacent building used to perform concurrent year annual average atmospheric dispersion (X/Q) calculations and reference

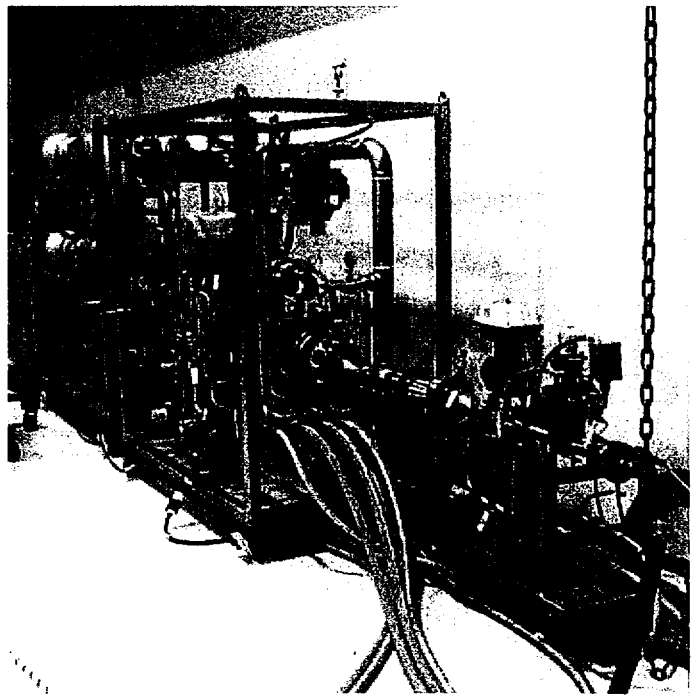
for this value. This information should be documented in the ODCM. Added responsibility for validation of meteorological data, since responsibility has changed from engineering to HPTS. Section 10.1.1: Revised to require a summary of Major Radwaste System changes to be included in the annual report. This was done to be consistent with FSAR 16.11.5.2. Several changes were made throughout the procedure to correct typographical errors and have no technical impact.

## 6.3 Major Changes to Radwaste Treatment Systems[3]

During 2000, there were no major plant modifications to the gaseous, solid or liquid radwaste treatment systems.

The following minor modification was made to the liquid radwaste system during 2000.

Temporary modification 00-0006 was installed to provide equipment to process liquid wastewater through a series of vendor supplied filters and demineralizer beds. This modification provides the necessary services to the vendor equipment to process wastewater. Because the wastewater continues to be collected in the Discharge Monitor Tanks and sampled prior to discharge, this change was not considered a major change. This modification was approved by ORC on 6/22/00 via meeting number 1745.



*Testing is performed on new equipment to determine if waste water can be more efficiently processed. Pictured is an ultrafiltration unit that uses membranes to remove radioactive particles from the water prior to being discharged.*

[3] Plant Memo NES 01-016

## 6.4 Land Use Census Changes

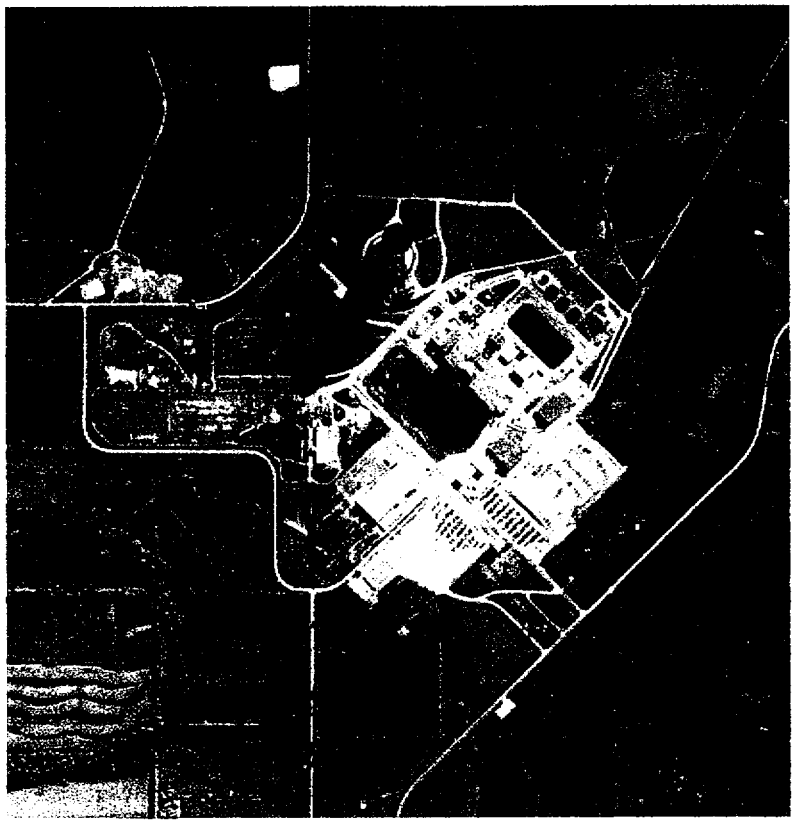
No changes were identified that required a change to the location of the nearest resident yielding the highest calculated dose commitment.

## 6.5 Inoperability of Effluent Monitoring Instrumentation

During 2000 all effluent monitoring instrumentation was OPERABLE within the limits specified in Radioactive Effluent Controls 16.11.1.3 and 16.11.2.4.

## 6.6 Instances of Liquid Holdup Tanks or Waste Gas Decay Tanks Exceeding Technical Specification Limits

All liquid tanks and waste gas decay tanks were within limits specified in Radioactive Effluent Controls 16.11.1 and 16.11.2 during the reporting period.



*Areal view of the Callaway Plant. Gaseous releases are made from the unit vent on top of containment and from the rad waste building. Liquids are released through the cooling tower blow down.*

# 7.0 Meteorological Data

The on-site meteorological data for this reporting period is presented in Table 4. The data is presented as Cumulative Joint Frequency Distributions of wind speed and wind direction by atmospheric stability class for the 10 and 60 meter tower elevations. Valid data recovery for 2000 was greater than 90% for all required parameters.

*Pictured is the Secondary Meteological Tower. This station obtains measurements at a height of 10 meters, and provides backup data for the Primary Meteological Tower readings at 10, 60 and 90 meters.*

# 8.0 Assessment of Doses

Assessment of doses to the maximum exposed individual from gaseous and liquid effluents released was performed in accordance with the ODCM as described in the following sections. For all effluents released from the Callaway Plant during this year, the annual dose to the maximum exposed individual was less than 10% of the Radiological Effluent Control Limits presented in Section 2.1 of this report.

## 8.1 Dose at the Site Boundary from Gaseous Effluents

The dose at the Site Boundary was due to plume exposure from noble gases, ground plane exposure, and inhalation. It was conservatively assumed that a hypothetical maximum exposed individual was present at the Site Boundary location with the most limiting atmospheric dispersion (based on actual meteorological conditions for the year). Dose was conservatively calculated using a child as the critical age group.

The dose from gaseous effluents at the Site Boundary for 2000 is presented in Table 5.

## 8.2 Dose to the Member of the Public

The Member of the Public is considered to be a real individual, not occupationally associated with the plant, who uses portions of the plant site for recreational or other purposes not associated with plant operation. This individual's utilization of areas both inside and outside the Site Boundary was characterized for this calculation and is described in the ODCM.

To evaluate total dose from the Uranium Fuel Cycle to any Member of the Public, the critical Member of the Public within the Site Boundary, and the Nearest Resident were each evaluated.

*Dose At The Nearest Resident From Gaseous Effluent*

The dose to the Nearest Resident was due to plume exposure from noble gases, ground plane exposure, and inhalation and ingestion. Dose was calculated at the nearest actual residence with the most limiting atmospheric dispersion (based on actual meteorological conditions for the year). It was conservatively assumed that each ingestion pathway (meat, milk, and vegetation) existed at this location. Dose was conservatively calculated assuming the child as the critical age group. Dose from activities within the Site Boundary was negligible and not included in this calculation.

The doses to the Nearest Resident for 2000 are presented in Table 5.

*Dose To The Member Of The Public From Activities Within The Site Boundary*

Based on the land use within the Site Boundary, the Member of the Public with the highest dose was a farmer. Dose from farming activities within the Site Boundary was due to direct radiation exposure, plume exposure from noble gases, ground plane exposure, and inhalation. The current tenant farmer estimates spending 1100 hours per year working within the Site Boundary area. Dose was calculated using the adult as the critical age group.

Dose to the Member of the Public from activities within the Site Boundary is presented in Table 6.

## 8.3 Total Dose Due to the Uranium Fuel Cycle

Since there are no other Uranium Fuel Cycle facilities within 8 kilometers of the Callaway Plant, the total dose to the most likely exposed Member of the Public resulted from direct radiation exposure and radioactive effluents from the Callaway Plant itself.

The total dose to the Member of the Public (Table 7) was the sum of the dose due to activities within the Site Boundary (Table 6) and the dose due to gaseous effluents at his residence. It was conservatively assumed that each food ingestion pathway exists at his residence and that the adult is the critical age group.

The total dose from the Uranium Fuel Cycle is presented in Table 7.

## 8.4 Dose Due to Liquid Effluents

Dose due to liquid effluents includes contributions from the maximum exposed individual's consumption of fish and recreational activities. An adult was considered the maximum exposed individual in this assessment.

It is conservatively assumed that the hypothetical maximum exposed individual obtained his entire annual fish intake from near the plant discharge.

Special Report 2000-03 was submitted to the NRC for the following event.

On July 7, 2000, the projected dose from liquid effluents discharged to unrestricted areas exceeded 2% of the guidelines of Appendix I to 10 CFR 50 for whole body dose while appropriate portions of the Liquid Radwaste Treatment System were unavailable.

In accordance with FSAR 16.11.1.4.1.b, the installed Liquid Radwaste Treatment System was OPERABLE by maintaining the dose from liquid effluents within the limits of FSAR 16.11.1.1 and 16.11.1.2.

FSAR 16.11.1.4.I requires the following actions:

With radioactive liquid waste being discharged in excess of 0.06 mrem whole body or 0.2 mrem to any organ in a 31 day period, and the Liquid Radwaste Treatment Systems are not being fully utilized, prepare and submit to the Commission within 30 days a Special Report that includes the following information:

*1. Explanation of why liquid radwaste was being discharged without treatment, identification of any inoperable equipment or subsystems, and the reason for the inoperability.*

On June 9, 2000 the recirculating pump seal on the Secondary Liquid Waste Evaporator (SLWE) used to process primary drains failed and made the SLWE inoperable.

During the time the SLWE was out of service a vendor filter/demineralization skid was installed to treat the water. All liquid effluents were treated to remove radioactivity prior to release. However, because of a high radioactive cesium source term the installed skid was not able to maintain discharges below 2% of the guidelines of Appendix I to 10 CFR 50.

*2. Action(s) taken to restore the inoperable equipment to OPERABLE status.*

Engineering and maintenance support was increased to expedite repair of the SLW evaporator.

The SLW evaporator was returned to service on July 24, 2000. At that time appropriate portions of the radwaste treatment system were being fully utilized to reduce the release of radioactivity to unrestricted areas and full compliance with the requirements of Callaway Plant Technical Specification 5.5.4(f) and FSAR 16.11.1.4.I was achieved.

*3. Summary description of action(s) taken to prevent a recurrence.*

During repair of the SLWE pump seal, a new type of seal was installed that will expedite future repairs.

A description of this event is documented in the plant Corrective Action Program[1]

Total dose due to liquid effluents from Callaway Plant during the year is presented in Table 8.

[1] CAR 20000001688

# *Table IA* Semiannual Summation of Gaseous Releases

## All Airborne Effluents

QUARTERS 1 AND 2, 2000

| TYPE OF EFFLUENT | UNITS | FIRST QUARTER | SECOND QUARTER | EST TOTAL ERROR % (a) |
|---|---|---|---|---|
| A. FISSION AND ACTIVATION GASES | | | | |
| 1. TOTAL RELEASE | CURIES | 5.69E+01 | 3.49E+01 | 20 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | uCi/SEC | 7.23E+00 | 4.44E+00 | |
| 3. PERCENT OF TECH SPEC LIMIT | % | N/A | N/A | |
| B. RADIOIODINES | | | | |
| 1. TOTAL IODINE-131 | CURIES | 6.80E-06 | 7.83E-08 | 23 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | uCi/SEC | 8.65E-07 | 9.96E-09 | |
| 3. PERCENT OF TECH SPEC LIMIT | % | N/A | N/A | |
| C. PARTICULATES | | | | |
| 1. PARTICULATE (HALF-LIVES > 8 DAYS) | CURIES | 4.15E-04 | 4.95E-05 | 30 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | uCi/SEC | 5.28E-05 | 6.29E-06 | |
| 3. PERCENT OF TECH SPEC LIMIT | % | N/A | N/A | |
| 4. GROSS ALPHA RADIOACTIVITY | CURIES | 8.66E-08 | 0.00E+00 | |
| D. TRITIUM | | | | |
| 1. TOTAL RELEASE | CURIES | 1.46E+01 | 2.33E+01 | 14 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | uCi/SEC | 1.86E+00 | 2.96E+00 | |
| 3. PERCENT OF TECH SPEC LIMIT | % | N/A | N/A | |

(a) Safety Analysis Calculation 87-063-00, January 6, 1988

# *Table IA* Semiannual Summation of Gaseous Releases

## All Airborne Effluents *Continued*

QUARTERS 3 AND 4, 2000

| TYPE OF EFFLUENT | UNITS | THIRD QUARTER | FOURTH QUARTER | EST TOTAL ERROR % (a) |
|---|---|---|---|---|
| A. FISSION AND ACTIVATION GASES | | | | |
| 1. TOTAL RELEASE | CURIES | 3.26E+01 | 1.10E+01 | 20 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | uCi/SEC | 4.10E+00 | 1.38E+00 | |
| 3. PERCENT OF TECH SPEC LIMIT | % | N/A | N/A | |
| B. RADIOIODINES | | | | |
| 1. TOTAL IODINE-131 | CURIES | 0.00E+00 | 0.00E+00 | 23 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | uCi/SEC | 0.00E+00 | 0.00E+00 | |
| 3. PERCENT OF TECH SPEC LIMIT | % | N/A | N/A | |
| C. PARTICULATES | | | | |
| 1. PARTICULATE (HALF-LIVES > 8 DAYS) | CURIES | 1.03E-04 | 7.19E-06 | 30 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | uCi/SEC | 1.29E-05 | 9.04E-07 | |
| 3. PERCENT OF TECH SPEC LIMIT | % | N/A | N/A | |
| 4. GROSS ALPHA RADIOACTIVITY | CURIES | 1.15E-07 | 1.45E-08 | |
| D. TRITIUM | | | | |
| 1. TOTAL RELEASE | CURIES | 2.00E+01 | 2.04E+01 | 14 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | uCi/SEC | 2.52E+00 | 2.57E+00 | |
| 3. PERCENT OF TECH SPEC LIMIT | % | N/A | N/A | |

(a) Safety Analysis Calculation 87-063-00, January 6, 1988

*Table IB* **Semiannual Airborne Continuous and Batch Releases, Ground Level Releases**

## *Fission Gases, Iodines, and Particulates*

QUARTERS 1 AND 2, 2000

| | | CONTINUOUS RELEASES | | BATCH RELEASES | |
|---|---|---|---|---|---|
| NUCLIDE | UNITS | FIRST QUARTER | SECOND QUARTER | FIRST QUARTER | SECOND QUARTER |
| 1. FISSION GASES | | | | | |
| XE-133 | CURIES | 4.66E+01 | 3.36E+01 | 6.71E+00 | 4.05E-01 |
| XE-135 | CURIES | 2.97E+00 | 3.61E-01 | 2.58E-02 | 9.87E-03 |
| AR-41 | CURIES | 0.00E+00 | 0.00E+00 | 7.36E-02 | 5.53E-02 |
| XE-131M | CURIES | 0.00E+00 | 0.00E+00 | 6.75E-02 | 0.00E+00 |
| XE-133M | CURIES | 1.79E-01 | 4.01E-01 | 3.80E-02 | 4.16E-03 |
| KR-85 | CURIES | 0.00E+00 | 0.00E+00 | 1.45E-01 | 7.81E-03 |
| KR-85M | CURIES | 0.00E+00 | 0.00E+00 | 8.49E-04 | 1.76E-04 |
| KR-88 | CURIES | 0.00E+00 | 0.00E+00 | 3.79E-04 | 1.66E-03 |
| XE-138 | CURIES | 0.00E+00 | 0.00E+00 | 5.87E-05 | 0.00E+00 |
| XE-135M | CURIES | 0.00E+00 | 0.00E+00 | 2.03E-06 | 0.00E+00 |
| XE-137 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.22E-03 |
| TOTAL FOR PERIOD | CURIES | 4.98E+01 | 3.44E+01 | 7.06E+00 | 4.86E-01 |
| 2. IODINES | | | | | |
| I-131 | CURIES | 2.72E-06 | 7.06E-08 | 4.08E-06 | 7.65E-09 |
| I-133 | CURIES | 0.00E+00 | 0.00E+00 | 2.72E-06 | 0.00E+00 |
| I-132 | CURIES | 0.00E+00 | 0.00E+00 | 6.60E-07 | 0.00E+00 |
| I-135 | CURIES | 0.00E+00 | 0.00E+00 | 9.15E-07 | 0.00E+00 |
| TOTAL FOR PERIOD | CURIES | 2.72E-06 | 7.06E-08 | 8.38E-06 | 7.65E-09 |
| 3. PARTICULATES | | | | | |
| RB-88 | CURIES | 0.00E+00 | 0.00E+00 | 2.13E-04 | 0.00E+00 |
| CS-137 | CURIES | 0.00E+00 | 5.46E-06 | 1.70E-04 | 3.21E-05 |
| CO-60 | CURIES | 0.00E+00 | 0.00E+00 | 3.11E-05 | 9.83E-06 |
| SB-125 | CURIES | 0.00E+00 | 0.00E+00 | 9.09E-07 | 0.00E+00 |
| Y-91M | CURIES | 0.00E+00 | 0.00E+00 | 7.87E-08 | 0.00E+00 |
| CS-134 | CURIES | 0.00E+00 | 2.10E-06 | 0.00E+00 | 0.00E+00 |
| ALPHA | CURIES | 8.66E-08 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD | CURIES | 8.66E-08 | 7.56E-06 | 4.15E-04 | 4.19E-05 |
| 4. TRITIUM | | | | | |
| H-3 | CURIES | 1.44E+01 | 2.26E+01 | 2.06E-01 | 7.45E-01 |

*Table IB* **Semiannual Airborne Continuous and Batch Releases, Ground Level Releases**

## *Fission Gases, Iodines, and Particulates*

QUARTERS 3 AND 4, 2000

| | | CONTINUOUS RELEASES | | BATCH RELEASES | |
|---|---|---|---|---|---|
| NUCLIDE | UNITS | THIRD QUARTER | FOURTH QUARTER | THIRD QUARTER | FOURTH QUARTER |
| 1. FISSION GASES | | | | | |
| XE-133 | CURIES | 3.14E+01 | 9.73E+00 | 4.10E-01 | 3.62E-01 |
| XE-135 | CURIES | 1.68E-01 | 4.09E-01 | 6.48E-03 | 3.56E-03 |
| AR-41 | CURIES | 0.00E+00 | 0.00E+00 | 4.21E-02 | 4.24E-02 |
| XE-131M | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.19E-03 |
| XE-133M | CURIES | 3.18E-01 | 0.00E+00 | 2.65E-03 | 1.66E-03 |
| KR-85 | CURIES | 0.00E+00 | 0.00E+00 | 2.86E-01 | 0.00E+00 |
| KR-85M | CURIES | 0.00E+00 | 0.00E+00 | 1.18E-04 | 1.30E-04 |
| KR-88 | CURIES | 0.00E+00 | 0.00E+00 | 9.43E-05 | 0.00E+00 |
| XE-138 | CURIES | 0.00E+00 | 4.41E-01 | 0.00E+00 | 0.00E+00 |
| XE-135M | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-137 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD | CURIES | 3.19E+01 | 1.06E+01 | 7.47E-01 | 4.11E-01 |
| 2. IODINES | | | | | |
| I-131 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-133 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-132 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-135 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3. PARTICULATES | | | | | |
| RB-88 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-137 | CURIES | 2.19E-05 | 3.59E-06 | 8.02E-06 | 2.04E-09 |
| CO-60 | CURIES | 1.56E-06 | 2.06E-06 | 6.33E-05 | 0.00E+00 |
| SB-125 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Y-91M | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-134 | CURIES | 7.77E-06 | 1.24E-06 | 0.00E+00 | 0.00E+00 |
| MN-54 | CURIES | 0.00E+00 | 2.28E-07 | 0.00E+00 | 0.00E+00 |
| CE-141 | CURIES | 0.00E+00 | 4.36E-08 | 0.00E+00 | 0.00E+00 |
| CO-57 | CURIES | 0.00E+00 | 2.97E-08 | 0.00E+00 | 0.00E+00 |
| ALPHA | CURIES | 1.15E-07 | 1.45E-08 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD | CURIES | 3.13E-05 | 7.20E-06 | 7.14E-05 | 2.04E-09 |
| 4. TRITIUM | | | | | |
| H-3 | CURIES | 1.92E+01 | 2.01E+01 | 8.54E-01 | 3.55E-01 |

# *Table 2A* Semiannual Summation of Liquid Releases

## All Liquid Effluents

QUARTERS 1 AND 2, 2000

| TYPE OF EFFLUENT | UNITS | FIRST QUARTER | SECOND QUARTER | EST TOTAL ERROR % (a) |
|---|---|---|---|---|
| A. FISSION AND ACTIVATION PRODUCTS | | | | |
| 1. TOTAL RELEASE [NOT INCLUDING TRITIUM, GASES, ALPHA] | CURIES | 3.60E-03 | 1.57E-02 | 20 |
| 2. AVERAGE DILUTED CONCENTRATION DURING PERIOD | uCi/ML | 1.09E-08 | 6.28E-08 | |
| 3. PERCENT OF APPLICABLE LIMIT | % | N/A | N/A | |
| B. TRITIUM | | | | |
| 1. TOTAL RELEASE | CURIES | 1.79E+02 | 8.71E+01 | 14 |
| 2. AVERAGE DILUTED CONCENTRATION DURING PERIOD | uCi/ML | 5.43E-04 | 3.49E-04 | |
| 3. PERCENT OF APPLICABLE LIMIT | % | N/A | N/A | |
| C. DISSOLVED AND ENTRAINED GASES | | | | |
| 1. TOTAL RELEASE | CURIES | 2.78E-01 | 5.06E-02 | 27 |
| 2. AVERAGE DILUTED CONCENTRATION DURING PERIOD | uCi/ML | 8.43E-07 | 2.02E-07 | |
| D. GROSS ALPHA RADIOACTIVITY | | | | |
| 1. TOTAL RELEASE | CURIES | 0.00E+00 | 0.00E+00 | 29 |
| E. WASTE VOLUME RELEASED (PRE-DILUTION) | GAL | 5.12E+06 | 4.25E+06 | 10 |
| F. VOLUME OF DILUTION WATER USED | GAL | 8.21E+07 | 6.18E+07 | 10 |

(a) Safety Analysis Calculation 87-063-00, January 6, 1988

# *Table 2A* Semiannual Summation of Liquid Releases

## All Liquid Effluents

QUARTERS 3 AND 4, 2000

| TYPE OF EFFLUENT | UNITS | THIRD QUARTER | FOURTH QUARTER | EST TOTAL ERROR % (a) |
|---|---|---|---|---|
| A. FISSION AND ACTIVATION PRODUCTS | | | | |
| 1. TOTAL RELEASE [NOT INCLUDING TRITIUM, GASES, ALPHA] | CURIES | 2.94E-02 | 3.94E-03 | 20 |
| 2. AVERAGE DILUTED CONCENTRATION DURING PERIOD | uCi/ML | 8.33E-08 | 1.00E-08 | |
| 3. PERCENT OF APPLICABLE LIMIT | % | N/A | N/A | |
| B. TRITIUM | | | | |
| 1. TOTAL RELEASE | CURIES | 2.56E+02 | 5.71E+02 | 14 |
| 2. AVERAGE DILUTED CONCENTRATION DURING PERIOD | uCi/ML | 7.27E-04 | 1.45E-03 | |
| 3. PERCENT OF APPLICABLE LIMIT | % | N/A | N/A | |
| C. DISSOLVED AND ENTRAINED GASES | | | | |
| 1. TOTAL RELEASE | CURIES | 8.49E-04 | 2.70E-02 | 27 |
| 2. AVERAGE DILUTED CONCENTRATION DURING PERIOD | uCi/ML | 2.41E-09 | 6.87E-08 | |
| D. GROSS ALPHA RADIOACTIVITY | | | | |
| 1. TOTAL RELEASE | CURIES | 0.00E+00 | 0.00E+00 | 29 |
| E. WASTE VOLUME RELEASED (PRE-DILUTION) | GAL | 6.14E+06 | 5.78E+06 | 10 |
| F. VOLUME OF DILUTION WATER USED | GAL | 8.70E+07 | 9.80E+07 | 10 |

(a) Safety Analysis Calculation 87-063-00, January 6, 1988

# *Table 2B* Semiannual Liquid Continuous & Batch Releases

## Totals for Each Nuclide Released

QUARTERS 1 AND 2, 2000

| | | CONTINUOUS RELEASES | | BATCH RELEASES | |
|---|---|---|---|---|---|
| NUCLIDE | UNITS | FIRST QUARTER | SECOND QUARTER | FIRST QUARTER | SECOND QUARTER |
| 1. ALL NUCLIDES | | | | | |
| CO-58 | CURIES | 0.00E+00 | 0.00E+00 | 1.14E-03 | 1.29E-03 |
| CO-60 | CURIES | 0.00E+00 | 0.00E+00 | 1.70E-03 | 1.56E-03 |
| CS-137 | CURIES | 0.00E+00 | 0.00E+00 | 2.45E-04 | 8.31E-03 |
| H-3 | CURIES | 0.00E+00 | 0.00E+00 | 1.79E+02 | 8.71E+01 |
| I-131 | CURIES | 0.00E+00 | 0.00E+00 | 6.22E-05 | 5.48E-05 |
| MN-54 | CURIES | 0.00E+00 | 0.00E+00 | 1.58E-04 | 4.07E-04 |
| SB-125 | CURIES | 0.00E+00 | 0.00E+00 | 2.27E-04 | 4.78E-04 |
| XE-133 | CURIES | 0.00E+00 | 0.00E+00 | 2.70E-01 | 5.01E-02 |
| NB-95 | CURIES | 0.00E+00 | 0.00E+00 | 1.80E-05 | 1.81E-04 |
| XE-133M | CURIES | 0.00E+00 | 0.00E+00 | 2.42E-03 | 2.77E-04 |
| XE-135 | CURIES | 0.00E+00 | 0.00E+00 | 2.71E-03 | 0.00E+00 |
| CE-141 | CURIES | 0.00E+00 | 0.00E+00 | 7.84E-06 | 0.00E+00 |
| KR-88 | CURIES | 0.00E+00 | 0.00E+00 | 7.07E-06 | 0.00E+00 |
| XE-131M | CURIES | 0.00E+00 | 0.00E+00 | 2.91E-03 | 2.02E-04 |
| CS-134 | CURIES | 0.00E+00 | 0.00E+00 | 2.86E-05 | 3.30E-03 |
| CO-57 | CURIES | 0.00E+00 | 0.00E+00 | 6.71E-06 | 0.00E+00 |
| ZR-95 | CURIES | 0.00E+00 | 0.00E+00 | 6.65E-06 | 3.15E-05 |
| ZR-97 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.84E-06 |
| TE-129 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E-05 |
| BE-7 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.64E-05 |
| SN-113 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.53E-06 |
| TC-99M | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.67E-06 |
| TOTALS FOR PERIOD | CURIES | 0.00E+00 | 0.00E+00 | 1.80E+02 | 8.72E+01 |

# *Table 2B* Semiannual Liquid Continuous & Batch Releases

## *Totals for Each Nuclide Released*

QUARTERS 3 AND 4, 2000

| | | CONTINUOUS RELEASES | | BATCH RELEASES | |
|---|---|---|---|---|---|
| NUCLIDE | UNITS | THIRD QUARTER | FOURTH QUARTER | THIRD QUARTER | FOURTH QUARTER |
| 1. ALL NUCLIDES | | | | | |
| CO-58 | CURIES | 0.00E+00 | 0.00E+00 | 4.94E-04 | 4.05E-06 |
| CO-60 | CURIES | 0.00E+00 | 0.00E+00 | 1.79E-03 | 1.76E-04 |
| CS-137 | CURIES | 0.00E+00 | 0.00E+00 | 1.88E-02 | 2.77E-03 |
| H-3 | CURIES | 0.00E+00 | 0.00E+00 | 2.56E+02 | 5.71E+02 |
| I-131 | CURIES | 0.00E+00 | 0.00E+00 | 1.30E-05 | 5.84E-06 |
| MN-54 | CURIES | 0.00E+00 | 0.00E+00 | 2.44E-04 | 6.17E-06 |
| SB-125 | CURIES | 0.00E+00 | 0.00E+00 | 7.79E-04 | 4.03E-06 |
| XE-133 | CURIES | 0.00E+00 | 0.00E+00 | 7.06E-04 | 2.60E-02 |
| NB-95 | CURIES | 0.00E+00 | 0.00E+00 | 2.64E-05 | 0.00E+00 |
| XE-133M | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.99E-05 |
| XE-135 | CURIES | 0.00E+00 | 0.00E+00 | 3.07E-06 | 0.00E+00 |
| CE-141 | CURIES | 0.00E+00 | 0.00E+00 | 2.59E-06 | 0.00E+00 |
| KR-88 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-131M | CURIES | 0.00E+00 | 0.00E+00 | 1.40E-04 | 9.39E-04 |
| CS-134 | CURIES | 0.00E+00 | 0.00E+00 | 7.15E-03 | 9.71E-04 |
| CO-57 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZR-95 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZR-97 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-129 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BE-7 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SN-113 | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TC-99M | CURIES | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-133 | CURIES | 0.00E+00 | 0.00E+00 | 4.69E-06 | 0.00E+00 |
| CR-51 | CURIES | 0.00E+00 | 0.00E+00 | 3.35E-05 | 0.00E+00 |
| BA-139 | CURIES | 0.00E+00 | 0.00E+00 | 1.82E-05 | 0.00E+00 |
| TOTALS FOR PERIOD | CURIES | 0.00E+00 | 0.00E+00 | 2.56E+02 | 5.71E+02 |

# *Table 3* Solid Waste & Irradiated Fuel Shipments

# 2000

A. SOLID WASTE BURIED (Does not include irradiated fuel)

1. Type of waste

| | UNITS | PERIOD JAN - JUN | PERIOD JUL - DEC | EST. TOTAL ERROR (%) |
|---|---|---|---|---|
| a. Spent resins, filter sludges evaporator bottoms, etc. | m3<br>Ci | 19.09<br>143.47 | 11.77<br>3.65 | ±25% |
| b. Dry compressible waste, contaminated equipment, etc. | m3<br>Ci | 8.15<br>0.46 | 11.17<br>0.429 | ±25% |
| c. Irradiated components, control rods, etc. | m3<br>Ci | | | |
| d. Other | m3<br>Ci | | 1.02<br>0.00116 | ±25% |

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

| | PERIOD JAN - JUN | | | PERIOD JUL - DEC | |
|---|---|---|---|---|---|
| Nuclide | Percent Abundance | Curies | Nuclide | Percent Abundance | Curies |
| a. Fe-55 | 7.87% | 11.3 | Fe-55 | 7.87% | 0.205 |
| Co-58 | 3.83% | 5.50 | Co-58 | 3.83% | 0.0999 |
| Co-60 | 25.50% | 36.6 | Co-60 | 25.50% | 0.665 |
| Ni-63 | 57.30% | 82.2 | Ni-63 | 57.30% | 1.50 |
| Cs-134 | 2.02% | 2.9 | Cs-134 | 2.02% | 0.0527 |
| Cs-137 | 3.47% | 4.98 | Cs-137 | 3.47% | 0.0905 |

| | | | | | |
|---|---|---|---|---|---|
| b. Fe-55 | 46.20% | 2.11E-4 | Fe-55 | 46.20% | 1.98E-1 |
| Co-58 | 22.00% | 1.01E-4 | Co-58 | 22.00% | 9.44E-2 |
| Ni-63 | 10.70% | 4.90E-5 | Ni-63 | 10.70% | 4.59E-2 |
| Co-60 | 7.31% | 3.35E-5 | Co-60 | 7.31% | 3.14E-2 |
| Nb-95 | 3.36% | 1.54E-5 | Nb-95 | 3.36% | 1.44E-2 |
| Zr-95 | 1.63% | 7.46E-6 | Zr-95 | 1.63% | 7.00E-3 |
| Mn-54 | 4.72% | 2.16E-5 | Mn-54 | 4.72% | 2.03E-2 |
| Cs-134 | 1.27% | 5.81E-6 | Cs-134 | 1.27% | 5.45E-3 |
| Cs-137 | 2.76% | 1.26E-5 | Cs-137 | 2.76% | 1.18E-2 |

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

| Nuclide | PERIOD JAN - JUN | | PERIOD JUL - DEC | |
|---|---|---|---|---|
| | Percent Abundance | Curies | Percent Abundance | Curies |
| c. None | | | | |
| d. Co-58 | | | 66.20% | 7.70E-4 |
| Co-60 | | | 18.90% | 2.20E-4 |
| Cs-137 | | | 7.36% | 8.56E-5 |
| Sb-125 | | | 4.12% | 4.79E-5 |
| Mn-54 | | | 3.40% | 3.95E-5 |

3. Solid waste disposition

| Number of Shipments | Mode of Transportation | Destination | Class of Solid Waste Shipped | Type of Container |
|---|---|---|---|---|
| 2 | Truck | Waste Control Specialists | A | LSA |
| 4* | Truck | GTS-Duratek | A | LSA |
| 2* | Truck | Allied Technologies Group | A | LSA |
| 2* | Cask | GTS-Duratek | A | LSA |
| 3 | Cask | Barnwell | C | LSA |

*Sent to waste processors for volume reduction before burial.

4. Solidification agent

Not used.

B. Irradited Fuel Shipments (Disposition)

| Number of Shipments | Mode of Transportation | Destination |
|---|---|---|
| None | | |

*Table IV*

# *Meteorological Data*

## *Averages Using Hourly Averaged Data*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

| | | UNITS | VALUES | % GOOD DATA |
|---|---|---|---|---|
| Stability Class | | A - G | E | 97% |
| Total Precipitation | | CM. | 5.80E+02 | 91 % |
| 10 Meter Level: | Wind Speed | Meter/Sec | 4.14E+00 | 100% |
| | Wind Direction | Degrees | 2.01E+02 | 94% |
| | Wind Direction Variability | Degrees | 1.26E+01 | 95% |
| | Reference Temperature | Degrees C | 1.27E+01 | 99% |
| | Dewpoint | Degrees C | 6.74E+00 | 99% |
| 60 Meter Level: | Wind Speed | Meter/Sec | 5.94E+00 | 94% |
| | Wind Direction | Degrees | 2.07E+02 | 92% |
| | Wind Direction Variability | Degrees | 8.26E+00 | 98% |
| | Dewpoint | Degrees C | NONE | 0% |
| | Temperature Difference 60 - 10 | Degrees C | 2.12E-01 | 97% |

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: A

| | Wind Speed at 10.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| NNE | 0 | 6 | 0 | 0 | 0 | 0 | 6 |
| NE | 0 | 3 | 0 | 0 | 0 | 0 | 3 |
| ENE | 0 | 3 | 2 | 0 | 0 | 0 | 5 |
| E | 0 | 1 | 4 | 0 | 0 | 0 | 5 |
| ESE | 0 | 9 | 13 | 2 | 0 | 0 | 24 |
| SE | 0 | 38 | 19 | 0 | 0 | 0 | 57 |
| SSE | 1 | 31 | 41 | 4 | 0 | 0 | 77 |
| S | 1 | 30 | 44 | 8 | 1 | 0 | 84 |
| SSW | 0 | 28 | 42 | 2 | 4 | 1 | 77I |
| SW | 1 | 22 | 29 | 3 | 1 | 0 | 56 |
| WSW | 0 | 7 | 7 | 1 | 0 | 0 | 15 |
| W | 0 | 0 | 6 | 2 | 0 | 0 | 8 |
| WNW | 2 | 1 | 15 | 4 | 0 | 0 | 22 |
| NW | 0 | 1 | 14 | 8 | 0 | 0 | 23 |
| NNW | 0 | 3 | 3 | 1 | 0 | 0 | 7 |
| TOT | 5 | 184 | 239 | 35 | 6 | 1 | 470 |

Hours of Calm Data: 0
Hours of Invalid Data: 7

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: B

| | Wind Speed at 10.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 0 | 3 | 1 | 0 | 0 | 0 | 4 |
| NNE | 0 | 4 | 5 | 0 | 0 | 0 | 9 |
| NE | 0 | 5 | 1 | 0 | 0 | 0 | 6 |
| ENE | 1 | 7 | 4 | 1 | 0 | 0 | 13 |
| E | 2 | 4 | 3 | 2 | 0 | 0 | 11 |
| ESE | 1 | 12 | 7 | 1 | 0 | 0 | 21 |
| SE | 2 | 24 | 18 | 0 | 0 | 0 | 44 |
| SSE | 1 | 18 | 14 | 2 | 0 | 0 | 35 |
| S | 1 | 20 | 15 | 4 | 1 | 0 | 41 |
| SSW | 1 | 17 | 21 | 2 | 0 | 0 | 41 |
| SW | 0 | 15 | 17 | 2 | 1 | 0 | 35 |
| WSW | 0 | 11 | 8 | 2 | 0 | 0 | 21 |
| W | 0 | 6 | 10 | 8 | 0 | 0 | 24 |
| WNW | 0 | 5 | 13 | 0 | 0 | 0 | 18 |
| NW | 0 | 5 | 13 | 3 | 0 | 0 | 21 |
| NNW | 0 | 4 | 3 | 0 | 0 | 0 | 7 |
| TOT | 9 | 160 | 153 | 27 | 2 | 0 | 351 |

Hours of Calm Data: 1
Hours of Invalid Data: 11

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: C

| | Wind Speed at 10.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 1 | 10 | 6 | 1 | 0 | 0 | 18 |
| NNE | 1 | 5 | 2 | 0 | 0 | 0 | 8 |
| NE | 2 | 7 | 4 | 0 | 0 | 0 | 13 |
| ENE | 1 | 5 | 2 | 1 | 0 | 0 | 9 |
| E | 0 | 14 | 2 | 1 | 0 | 0 | 17 |
| ESE | 1 | 10 | 7 | 0 | 0 | 0 | 18 |
| SE | 2 | 18 | 11 | 2 | 0 | 0 | 33 |
| SSE | 1 | 13 | 17 | 2 | 0 | 0 | 33 |
| S | 0 | 23 | 15 | 4 | 0 | 0 | 42 |
| SSW | 1 | 16 | 18 | 4 | 0 | 0 | 39 |
| SW | 2 | 17 | 12 | 2 | 3 | 0 | 36 |
| WSW | 2 | 12 | 13 | 1 | 0 | 0 | 28 |
| W | 0 | 9 | 11 | 2 | 0 | 0 | 22 |
| WNW | 0 | 10 | 9 | 4 | 0 | 0 | 23 |
| NW | 0 | 11 | 7 | 3 | 0 | 0 | 21 |
| NNW | 0 | 9 | 9 | 2 | 0 | 0 | 20 |
| TOT | 14 | 189 | 145 | 29 | 3 | 0 | 380 |

Hours of Calm Data: 0
Hours of Invalid Data: 23

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: D

| | Wind Speed at 10.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 14 | 74 | 53 | 14 | 0 | 0 | 155 |
| NNE | 4 | 55 | 53 | 5 | 0 | 0 | 117 |
| NE | 13 | 49 | 20 | 5 | 0 | 0 | 87 |
| ENE | 5 | 46 | 26 | 15 | 1 | 0 | 93 |
| E | 7 | 53 | 35 | 7 | 0 | 0 | 102 |
| ESE | 8 | 46 | 47 | 9 | 1 | 0 | 111 |
| SE | 10 | 61 | 50 | 8 | 0 | 0 | 129 |
| SSE | 8 | 74 | 59 | 14 | 4 | 0 | 159 |
| S | 12 | 47 | 59 | 16 | 2 | 0 | 136 |
| SSW | 5 | 56 | 34 | 11 | 1 | 0 | 107 |
| SW | 6 | 43 | 45 | 15 | 1 | 0 | 110 |
| WSW | 9 | 42 | 28 | 16 | 2 | 0 | 97 |
| W | 5 | 43 | 55 | 38 | 5 | 0 | 146 |
| WNW | 7 | 49 | 59 | 72 | 23 | 1 | 211 |
| NW | 5 | 45 | 57 | 41 | 11 | 3 | 162 |
| NNW | 8 | 100 | 64 | 27 | 3 | 0 | 202 |
| TOT | 126 | 883 | 744 | 313 | 54 | 4 | 2124 |

Hours of Calm Data: 0
Hours of Invalid Data: 125

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: E

| | Wind Speed at 10.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 10 | 46 | 95 | 47 | 6 | 1 | 205 |
| NNE | 12 | 64 | 79 | 16 | 0 | 0 | 171 |
| NE | 14 | 41 | 71 | 5 | 0 | 0 | 131 |
| ENE | 10 | 35 | 51 | 7 | 0 | 0 | 103 |
| E | 10 | 39 | 50 | 21 | 0 | 0 | 120 |
| ESE | 10 | 54 | 91 | 39 | 5 | 0 | 199 |
| SE | 11 | 71 | 131 | 77 | 3 | 0 | 293 |
| SSE | 13 | 95 | 130 | 97 | 7 | 0 | 342 |
| S | 21 | 61 | 97 | 110 | 3 | 0 | 292 |
| SSW | 10 | 50 | 61 | 32 | 1 | 0 | 154 |
| SW | 17 | 49 | 48 | 36 | 2 | 0 | 152 |
| WSW | 14 | 30 | 45 | 26 | 5 | 1 | 121 |
| W | 22 | 39 | 71 | 55 | 8 | 0 | 195 |
| WNW | 11 | 36 | 83 | 73 | 17 | 0 | 220 |
| NW | 21 | 39 | 67 | 51 | 11 | 2 | 191 |
| NNW | 7 | 60 | 93 | 47 | 6 | 0 | 213 |
| TOT | 213 | 809 | 1263 | 739 | 74 | 4 | 3102 |

Hours of Calm Data: 0
Hours of Invalid Data: 166

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: F

| | Wind Speed at 10.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 3 | 10 | 23 | 12 | 0 | 0 | 48 |
| NNE | 15 | 13 | 16 | 2 | 0 | 0 | 46 |
| NE | 10 | 18 | 33 | 0 | 0 | 0 | 61 |
| ENE | 7 | 13 | 18 | 0 | 0 | 0 | 38 |
| E | 5 | 15 | 20 | 0 | 0 | 0 | 40 |
| ESE | 4 | 15 | 40 | 1 | 0 | 0 | 60 |
| SE | 4 | 40 | 119 | 21 | 0 | 0 | 184 |
| SSE | 8 | 26 | 138 | 24 | 0 | 0 | 196 |
| S | 8 | 21 | 89 | 37 | 0 | 0 | 155 |
| SSW | 7 | 37 | 54 | 8 | 0 | 0 | 106 |
| SW | 2 | 12 | 21 | 4 | 0 | 0 | 39 |
| WSW | 5 | 13 | 31 | 1 | 0 | 0 | 50 |
| W | 3 | 13 | 43 | 2 | 2 | 0 | 63 |
| WNW | 4 | 16 | 40 | 3 | 0 | 0 | 63 |
| NW | 5 | 29 | 47 | 1 | 0 | 0 | 82 |
| NNW | 3 | 13 | 30 | 1 | 0 | 0 | 47 |
| TOT | 93 | 304 | 762 | 117 | 2 | 0 | 1278 |

Hours of Calm Data: 15
Hours of Invalid Data: 96

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: G

| | Wind Speed at 10.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 5 | 11 | 6 | 1 | 2 | 0 | 25 |
| NNE | 6 | 2 | 27 | 0 | 0 | 0 | 35 |
| NE | 7 | 8 | 25 | 0 | 0 | 0 | 40 |
| ENE | 7 | 9 | 9 | 0 | 0 | 0 | 25 |
| E | 3 | 2 | 5 | 0 | 0 | 0 | 10 |
| ESE | 4 | 5 | 12 | 0 | 0 | 0 | 21 |
| SE | 4 | 9 | 41 | 8 | 0 | 0 | 62 |
| SSE | 8 | 13 | 53 | 11 | 0 | 0 | 85 |
| S | 7 | 11 | 27 | 0 | 0 | 0 | 45 |
| SSW | 3 | 10 | 23 | 1 | 0 | 0 | 37 |
| SW | 3 | 5 | 11 | 0 | 0 | 0 | 19 |
| WSW | 1 | 4 | 2 | 0 | 0 | 0 | 7 |
| W | 3 | 11 | 10 | 0 | 0 | 0 | 24 |
| WNW | 1 | 12 | 14 | 0 | 0 | 0 | 27 |
| NW | 1 | 7 | 20 | 0 | 0 | 0 | 28 |
| NNW | 1 | 11 | 33 | 0 | 0 | 0 | 45 |
| TOT | 64 | 130 | 318 | 21 | 2 | 0 | 535 |

Hours of Calm Data: 5
Hours of Invalid Data: 55
Hours of Good Data: 8270 = 94.1% of Total Hours

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: A

| | Wind Speed at 60.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4- 7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 0 | 1 | 2 | 0 | 0 | 0 | 3 |
| NNE | 0 | 4 | 1 | 0 | 0 | 0 | 5 |
| NE | 0 | 1 | 2 | 0 | 0 | 0 | 3 |
| ENE | 1 | 1 | 2 | 0 | 0 | 0 | 4 |
| E | 0 | 2 | 3 | 3 | 0 | 0 | 8 |
| ESE | 0 | 4 | 10 | 4 | 0 | 0 | 18 |
| SE | 0 | 10 | 39 | 1 | 0 | 0 | 50 |
| SSE | 0 | 23 | 46 | 17 | 1 | 0 | 87 |
| S | 0 | 16 | 36 | 22 | 7 | 1 | 82 |
| SSW | 0 | 8 | 45 | 18 | 0 | 5 | 76 |
| SW | 0 | 6 | 21 | 23 | 3 | 2 | 55 |
| WSW | 0 | 4 | 5 | 6 | 1 | 0 | 16 |
| W | 1 | 3 | 2 | 2 | 1 | 0 | 9 |
| WNW | 0 | 0 | 2 | 16 | 1 | 0 | 19 |
| NW | 0 | 1 | 4 | 14 | 8 | 0 | 27 |
| NNW | 0 | 0 | 1 | 3 | 1 | 0 | 5 |
| TOT | 2 | 84 | 221 | 129 | 23 | 8 | 467 |

Hours of Calm Data: 0
Hours of Invalid Data: 10

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: B

| | Wind Speed at 60.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 0 | 3 | 1 | 2 | 0 | 0 | 6 |
| NNE | 0 | 4 | 6 | 0 | 0 | 0 | 10 |
| NE | 0 | 4 | 1 | 0 | 0 | 0 | 5 |
| ENE | 0 | 4 | 5 | 3 | 0 | 0 | 12 |
| E | 3 | 5 | 4 | 2 | 0 | 0 | 14 |
| ESE | 0 | 9 | 8 | 3 | 0 | 0 | 20 |
| SE | 1 | 18 | 19 | 4 | 0 | 0 | 42 |
| SSE | 1 | 9 | 18 | 9 | 2 | 0 | 39 |
| S | 0 | 10 | 17 | 9 | 2 | 1 | 39 |
| SSW | 0 | 5 | 16 | 19 | 1 | 2 | 43 |
| SW | 0 | 6 | 17 | 9 | 2 | 1 | 35 |
| WSW | 0 | 3 | 10 | 5 | 1 | 0 | 19 |
| W | 1 | 5 | 3 | 9 | 6 | 0 | 24 |
| WNW | 0 | 2 | 12 | 6 | 2 | 0 | 22 |
| NW | 0 | 2 | 9 | 5 | 3 | 0 | 19 |
| NNW | 1 | 2 | 2 | 1 | 0 | 0 | 6 |
| TOT | 7 | 91 | 148 | 86 | 19 | 4 | 355 |

Hours of Calm Data: 0
Hours of Invalid Data: 8

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: C

| | Wind Speed at 60.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 0 | 5 | 6 | 4 | 0 | 0 | 15 |
| NNE | 0 | 4 | 5 | 1 | 0 | 0 | 10 |
| NE | 0 | 8 | 5 | 0 | 0 | 0 | 13 |
| ENE | 0 | 3 | 5 | 1 | 0 | 0 | 9 |
| E | 0 | 11 | 4 | 2 | 0 | 0 | 17 |
| ESE | 1 | 8 | 9 | 2 | 0 | 0 | 20 |
| SE | 0 | 15 | 11 | 1 | 0 | 0 | 27 |
| SSE | 0 | 12 | 15 | 8 | 3 | 0 | 38 |
| S | 0 | 16 | 19 | 10 | 4 | 0 | 49 |
| SSW | 0 | 13 | 15 | 6 | 4 | 0 | 38 |
| SW | 2 | 5 | 19 | 11 | 1 | 5 | 43 |
| WSW | 0 | 4 | 9 | 8 | 0 | 0 | 21 |
| W | 0 | 3 | 9 | 6 | 3 | 0 | 21 |
| WNW | 0 | 4 | 11 | 6 | 4 | 1 | 26 |
| NW | 0 | 9 | 6 | 4 | 2 | 0 | 21 |
| NNW | 0 | 1 | 10 | 3 | 1 | 0 | 15 |
| TOT | 3 | 121 | 158 | 73 | 22 | 6 | 383 |

Hours of Calm Data: 0
Hours of Invalid Data: 20

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: D

| | Wind Speed at 60.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 3 | 42 | 62 | 32 | 5 | 0 | 144 |
| NNE | 8 | 37 | 56 | 16 | 1 | 0 | 118 |
| NE | 1 | 24 | 37 | 9 | 0 | 0 | 71 |
| ENE | 3 | 28 | 33 | 19 | 6 | 0 | 89 |
| E | 5 | 23 | 41 | 7 | 5 | 0 | 81 |
| ESE | 2 | 23 | 54 | 25 | 4 | 0 | 108 |
| SE | 5 | 40 | 44 | 29 | 2 | 0 | 120 |
| SSE | 5 | 36 | 63 | 30 | 7 | 4 | 145 |
| S | 6 | 33 | 69 | 45 | 10 | 3 | 166 |
| SSW | 2 | 19 | 60 | 32 | 11 | 1 | 125 |
| SW | 2 | 22 | 53 | 38 | 13 | 6 | 134 |
| WSW | 3 | 18 | 35 | 27 | 10 | 7 | 100 |
| W | 2 | 17 | 40 | 36 | 24 | 12 | 131 |
| WNW | 2 | 21 | 41 | 65 | 49 | 30 | 208 |
| NW | 5 | 27 | 22 | 67 | 32 | 18 | 171 |
| NNW | 1 | 46 | 63 | 45 | 8 | 2 | 165 |
| TOT | 55 | 456 | 773 | 522 | 187 | 83 | 2076 |

Hours of Calm Data: 0
Hours of Invalid Data: 173

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: E

| | Wind Speed at 60.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 3 | 12 | 72 | 101 | 15 | 3 | 206 |
| NNE | 1 | 31 | 74 | 67 | 6 | 0 | 179 |
| NE | 1 | 18 | 68 | 33 | 2 | 0 | 122 |
| ENE | 2 | 8 | 52 | 53 | 0 | 0 | 115 |
| E | 2 | 14 | 50 | 43 | 3 | 0 | 112 |
| ESE | 1 | 12 | 81 | 112 | 18 | 0 | 224 |
| SE | 0 | 17 | 64 | 123 | 31 | 0 | 235 |
| SSE | 5 | 24 | 82 | 131 | 49 | 4 | 295 |
| S | 0 | 20 | 55 | 153 | 73 | 6 | 307 |
| SSW | 2 | 15 | 57 | 88 | 29 | 6 | 197 |
| SW | 4 | 12 | 59 | 63 | 33 | 2 | 173 |
| WSW | 4 | 10 | 28 | 34 | 22 | 6 | 104 |
| W | 1 | 16 | 43 | 74 | 49 | 8 | 191 |
| WNW | 2 | 13 | 40 | 80 | 52 | 15 | 202 |
| NW | 2 | 11 | 42 | 75 | 41 | 17 | 188 |
| NNW | 3 | 18 | 45 | 67 | 19 | 6 | 158 |
| TOT | 33 | 251 | 912 | 1297 | 442 | 73 | 3008 |

Hours of Calm Data: 1
Hours of Invalid Data: 268

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: F

| | Wind Speed at 60.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 0 | 2 | 14 | 28 | 9 | 0 | 53 |
| NNE | 1 | 5 | 18 | 17 | 3 | 0 | 44 |
| NE | 0 | 9 | 29 | 4 | 0 | 0 | 42 |
| ENE | 1 | 2 | 23 | 18 | 1 | 0 | 45 |
| E | 2 | 9 | 20 | 25 | 0 | 0 | 56 |
| ESE | 0 | 3 | 31 | 46 | 3 | 0 | 83 |
| SE | 0 | 2 | 33 | 68 | 10 | 0 | 113 |
| SSE | 1 | 4 | 55 | 108 | 23 | 0 | 191 |
| S | 0 | 5 | 40 | 105 | 23 | 0 | 173 |
| SSW | 0 | 5 | 25 | 77 | 35 | 1 | 143 |
| SW | 0 | 1 | 17 | 29 | 22 | 0 | 69 |
| WSW | 0 | 2 | 10 | 8 | 6 | 0 | 26 |
| W | 0 | 6 | 18 | 32 | 10 | 2 | 68 |
| WNW | 0 | 1 | 21 | 33 | 4 | 0 | 59 |
| NW | 0 | 4 | 21 | 41 | 2 | 0 | 68 |
| NNW | 1 | 2 | 11 | 31 | 3 | 0 | 48 |
| TOT | 6 | 62 | 386 | 670 | 154 | 3 | 1281 |

Hours of Calm Data: 0
Hours of Invalid Data: 108

# *Totals of Hours at Each Wind Speed & Direction*

1-JAN-2000 00:00:00:00 to 31-DEC-2000 23:00:00:00

Stability Class: G

| | Wind Speed at 60.00 Meter Level (MPH) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | TOTAL |
| N | 0 | 0 | 4 | 24 | 2 | 2 | 32 |
| NNE | 0 | 0 | 5 | 16 | 0 | 0 | 21 |
| NE | 1 | 1 | 17 | 9 | 0 | 0 | 28 |
| ENE | 0 | 2 | 11 | 26 | 0 | 0 | 39 |
| E | 0 | 2 | 7 | 16 | 0 | 0 | 25 |
| ESE | 0 | 4 | 9 | 15 | 0 | 0 | 28 |
| SE | 0 | 1 | 11 | 15 | 2 | 0 | 29 |
| SSE | 1 | 1 | 13 | 30 | 9 | 0 | 54 |
| S | 0 | 1 | 20 | 36 | 8 | 0 | 65 |
| SSW | 0 | 1 | 17 | 24 | 3 | 0 | 45 |
| SW | 0 | 0 | 10 | 17 | 7 | 0 | 34 |
| WSW | 0 | 1 | 9 | 4 | 0 | 0 | 14 |
| W | 0 | 6 | 9 | 2 | 1 | 0 | 18 |
| WNW | 0 | 0 | 8 | 12 | 3 | 0 | 23 |
| NW | 0 | 0 | 8 | 16 | 2 | 0 | 26 |
| NNW | 0 | 2 | 12 | 8 | 4 | 0 | 26 |
| TOT | 2 | 22 | 170 | 270 | 41 | 2 | 507 |

Hours of Calm Data: 0
Hours of Invalid Data: 88
Hours of Good Data: 8078 = 92.0% of Total Hours

# *Table V* Dose at the Site Boundry and to the Nearest Resident From Gaseous Effluents

| | | SITE BOUNDARY | | NEAREST RESIDENT | |
|---|---|---|---|---|---|
| | | LOCATION: 2.20 km NNW | | LOCATION: 2.90 km NNW | |
| | | AGE GROUP: CHILD | | AGE GROUP: CHILD | |
| ORGAN | UNITS | DOSE | % LIMIT(a) | DOSE | % LIMIT(b) |
| 1. GAMMA AIR DOSE * | MRAD | 1.11E-03 | 0.01 | 7.36E-04 | N/A |
| 2. BETA AIR DOSE * | MRAD | 2.81E-03 | 0.01 | 1.86E-03 | N/A |
| 3. WHOLE BODY *** | MREM | 1.63E-03 | N/A | 1.06E-03 | N/A |
| 4. SKIN *** | MREM | 2.85E-03 | N/A | 1.87E-03 | N/A |
| 5. BONE ** | MREM | 6.80E-04 | N/A | 3.83E-03 | 0.03 |
| 6. LIVER ** | MREM | 2.08E-03 | N/A | 1.19E-02 | 0.08 |
| 7. TOTAL BODY ** | MREM | 2.07E-03 | N/A | 9.10E-03 | 0.06 |
| 8. THYROID ** | MREM | 2.07E-03 | N/A | 9.20E-03 | 0.06 |
| 9. KIDNEY ** | MREM | 2.07E-03 | N/A | 9.67E-03 | 0.06 |
| 10. LUNG ** | MREM | 2.09E-03 | N/A | 8.98E-03 | 0.06 |
| 11. GI-LLI ** | MREM | 2.07E-03 | N/A | 8.63E-03 | 0.06 |

* Dose from Noble Gases only

** Dose from Tritium, Radioiodines, and Particulates only

*** Dose from Noble Gases plus Ground Plane dose

(a) Annual dose limits of Offsite Dose Calculation Manual (APA-ZZ-001003) of 10 mrad gamma air dose and 20 mrad beta air dose.

(b) Annual dose limits of Offsite Dose Calculation Manual (APA-ZZ-001003) of 15 mrem to any organ from I-131, I-133, H-3 and particulate radionuclides with halflives greater than 8 days.

*Table VI*

# *Dose to the Member of the Public From Activities within the Site Boundary*

| ORGAN | UNITS | EFFLUENT DOSE WITHIN THE SITE BOUNDARY | DIRECT RADIATION FROM THE UNIT | DIRECT RADIATION FROM OUTSIDE TANKS | TOTAL DOSE FOR THE YEAR |
|---|---|---|---|---|---|
| 1. SKIN | MREM | 9.60E-04 | N/A | N/A | 9.60E-04 |
| 2. BONE | MREM | 2.02E-04 | 8.79E-03 | 1.30E-03 | 1.03E-02 |
| 3. LIVER | MREM | 9.53E-04 | 8.79E-03 | 1.30E-03 | 1.10E-02 |
| 4. TOTAL BODY | MREM | 1.38E-03 | 8.79E-03 | 1.30E-03 | 1.15E-02 |
| 5. THYROID | MREM | 9.53E-04 | 8.79E-03 | 1.30E-03 | 1.10E-02 |
| 6. KIDNEY | MREM | 9.53E-04 | 8.79E-03 | 1.30E-03 | 1.10E-02 |
| 7. LUNG | MREM | 9.57E-04 | 8.79E-03 | 1.30E-03 | 1.10E-02 |
| 8. GI-LLI | MREM | 9.53E-04 | 8.79E-03 | 1.30E-03 | 1.10E-02 |

## *Table VII* Total Dose Due to the Uranium Fuel Cycle

## *(Member of the Public)*

| ORGAN | UNITS | DOSE AT THE RESIDENCE LOCATION | DOSE FROM ACTIVITIES WITHIN SITE BOUNDARY | TOTAL DOSE TO THE MEMBER OF THE PUBLIC | % LIMITS * |
|---|---|---|---|---|---|
| 1. SKIN | MREM | 5.54E-04 | 9.60E-04 | 1.51E-03 | 0.01 |
| 2. BONE | MREM | 4.82E-04 | 1.03E-02 | 1.08E-02 | 0.04 |
| 3. LIVER | MREM | 2.48E-03 | 1.10E-02 | 1.35E-02 | 0.05 |
| 4. TOTAL BODY | MREM | 2.58E-03 | 1.15E-02 | 1.40E-02 | 0.06 |
| 5. THYROID | MREM | 2.12E-03 | 1.10E-02 | 1.32E-02 | 0.02 |
| 6. KIDNEY | MREM | 2.19E-03 | 1.10E-02 | 1.32E-02 | 0.05 |
| 7. LUNG | MREM | 2.09E-03 | 1.10E-02 | 1.31E-02 | 0.05 |
| 8. GI-LLI | MREM | 2.06E-03 | 1.10E-02 | 1.31E-02 | 0.05 |

* Annual dose limits from 40CFR190.10(a) of 25 mrem whole body, 75 mrem to the thyroid, and 25 mrem to any other organ.

*Table VIII*

# *Dose Due to Liquid Effluents*

## *(Member of the Public)*

## *2000*

| ORGAN | UNITS | DOSE | LIMIT * | % LIMIT |
|---|---|---|---|---|
| 1. BONE | MREM | 2.14E-01 | 10.00 | 2.14E+00 |
| 2. LIVER | MREM | 3.45E-01 | 10.00 | 3.45E+00 |
| 3. TOTAL BODY | MREM | 2.46E-01 | 3.00 | 8.21E+00 |
| 4. THYROID | MREM | 3.68E-03 | 10.00 | 3.68E-02 |
| 5. KIDNEY | MREM | 1.17E-01 | 10.00 | 1.17E+00 |
| 6. LUNG | MREM | 4.14E-02 | 10.00 | 4.14E-01 |
| 7. GI-LLI | MREM | 1.54E-02 | 10.00 | 1.54E-01 |

* Annual dose limits of APA-ZZ-01003, Section 9.4.1.1.