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Humboldt Bay Power Plant
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PG&E Letter HBL-07-004

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Docket No. 50-133, OL-DPR-7
Humboldt Bay Power Plant Unit 3
Annual Radioactive Effluent Release Report for 2006

Dear Commissioners and Staff:

Enclosure 1 contains the Humboldt Bay Power Plant Unit 3 "Annual Radioactive Effluent Release Report," covering the period January 1 through December 31, 2006. This report is required by Section 5.7.3 of the Humboldt Bay Power Plant Unit 3 Technical Specifications.

The SAFSTOR Offsite Dose Calculation Manual was not revised during the report period. Therefore, it is not being submitted at this time, in accordance with the criteria in Section 4.2 of the SAFSTOR Offsite Dose Calculation Manual.

Sincerely,

R. Terry Nelson

cc: Joe Davis
Emilio M. Garcia
John B. Hickman
Bruce S. Mallett
David Sokolsky
PG FossilGen HBPP Humboldt Distribution

Enclosures

IE48
NMSS01

Enclosure 1
PG&E Letter HBL-07-004

HUMBOLDT BAY POWER PLANT UNIT 3
ANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

January 1 through December 31, 2006

PACIFIC GAS AND ELECTRIC COMPANY
HUMBOLDT BAY POWER PLANT
DOCKET NO. 50-133, LICENSE NO. DPR-7

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 1, 2006 THROUGH DECEMBER 31, 2006

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HUMBOLDT BAY POWER PLANT

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT 2006

INTRODUCTION

This report summarizes gaseous and liquid radioactive effluent releases from Humboldt Bay Power Plant Unit 3 for the four quarters of 2006. The report includes calculated potential radiation doses from these radioactive effluents and a comparison with the numerical guidelines of 10 CFR 50, Appendix I, as well as a summary of shipments of solid radioactive waste. The concentrations of plant effluent releases during the reporting period were well below Offsite Dose Calculation Manual (ODCM) limits.

The information is reported as required by Section 5.7.3 of the Humboldt Bay Power Plant Unit 3 Technical Specifications and Section 4.2 of the ODCM, and it is presented in the general format of Regulatory Guide 1.21, Appendix B (except for the topics identified below).

Meteorology

The meteorological data logging system was removed from service in 1967 so the information specified by Regulatory Guide 1.21, Appendix B, Section F, is not available. Previous Humboldt Bay Power Plant Annual Radioactive Effluent Release Reports summarized the cumulative joint frequency distribution of wind speed, direction, and atmospheric stability for the period April 1962 through June 1967, when the meteorological data logging system was in service.

Short-lived Nuclides

The Unit was last operated on July 2, 1976. Due to the long decay time since operation, short-lived radionuclides are neither expected nor reported. This includes Iodines and noble gases other than Krypton-85.

Air Particulate Filter Composites – Sr-90

Air particulate sample filters are combined for approximately monthly intervals and analyzed off-site for Sr-90.

Air Particulate Filter Composites – Gross Alpha

Each weekly sample filter is individually counted for gross alpha activity, rather than analyzing a monthly composite of the filters, as described in Regulatory Guide 1.21.

Gaseous Effluents – Tritium

Tritium releases during plant operation were less than detection levels. Since the plant was permanently shutdown in 1976, current tritium release levels are less than the release

levels that occurred during plant operations. Therefore, no tritium samples were collected during this reporting period.

Liquid Effluents – Sr-90

Batch releases may be analyzed individually, or composited and analyzed monthly, rather than analyzed as a quarterly composite as described in Regulatory Guide 1.21.

Average Energy

For HBPP, calculations for the average energy of gaseous releases of fission and activation gases are not required to be performed or reported.

I. SUPPLEMENTAL INFORMATION

A. Regulatory Limits

1. Gaseous Effluents

a. Noble Gas Release Rate Limit

The radioactive noble gas release rate limit is based on concentration limits from 10 CFR 20, divided by an annual average dispersion factor for the sector with the least favorable atmospheric dispersion. The applicable annual average dispersion factor is 1.0E-5 seconds per cubic meter.

b. Iodine Release Rate Limit

Due to the long decay time since the Unit was shutdown, the license does not define an iodine release rate limit.

c. Particulate Release Rate Limit

The radioactive particulate release rate limit is based on concentration limits from 10 CFR 20, divided by an annual average dispersion factor for the sector with the least favorable atmospheric dispersion. The applicable annual average dispersion factors for elevated releases and for ground-level releases are 1.0E-5 and 6.59E-3 seconds per cubic meter, respectively. The radionuclide mixture was determined to be 65% Cs-137, 9% Co-60 and 4% Sr-90, 5% Fe-55, 11% Ni-63 and 6% Pu-241.
These values were updated based on analytical results from 2005.

When both elevated and ground-level releases occur, the "percent of applicable limit" in Table 1 is the sum of the values for "percent of applicable limit" for each of the release paths.

2. Liquid Effluents

a. Concentration Limit

Concentration limits for liquid effluent radioactivity released to Humboldt Bay are taken from 10 CFR 20.

B. Maximum Permissible Concentrations

1. Gaseous Effluents

Maximum Permissible Concentrations for gaseous effluents are taken from 10 CFR 20, Appendix B, Table 2, Column 1.

2. Liquid Effluents

Maximum Permissible Concentrations for liquid effluents taken from 10 CFR 20, Appendix B, Table 2, Column 2.

C. Measurements and Approximations of Total Radioactivity

1. Gaseous Effluents – Elevated Release

a. Fission and Activation Gases

All ventilation and system vents are routed to the Unit 3 stack. A continuous monitor equipped with a beta scintillator, with its response calibrated for Kr-85, monitors the gaseous activity released from the stack.

The "less than" value reported for Kr-85 is based on the estimated sensitivity of the stack Kr-85 monitor.

The estimated sensitivity of the stack Kr-85 monitor permits detection of Kr-85 at approximately 50% of the applicable LLD presented in the ODCM.

b. Iodines

Due to the long decay time since operation (shutdown July 2, 1976), no detectable releases of radioactive Iodines can be expected. Therefore, neither the Technical Specifications nor the ODCM require that these radionuclides be monitored.

c. Particulates

Radioactive particulates released from the plant stack are monitored by continuous sample collection on particulate filters. Filter papers are

removed from the stack sampling system weekly, and are analyzed for the concentration of gamma-emitting nuclides (intrinsic germanium detector). All statistically significant gamma peaks are identified.

After decaying at least 7 days, the filters are analyzed for gross alpha radioactivity (internal proportional counter or scintillation counter).

Filters are composited monthly and analyzed monthly for Strontium-90 (the only radioactive Strontium present) and Americium-241 by alpha spectroscopy. The monthly composite results are averaged together to produce the quarterly composite result.

The estimated error of the reported particulate release values is based on uncertainty in sample flow rate, stack flow rate, detector calibration, and typical sample counting statistics.

The Minimum Detectable Activity (MDA) for all particulate filter samples was less than the applicable LLD presented in the ODCM.

Samples are assigned to calendar quarters as of the termination of the sample period. The amount of activity reported for a calendar quarter is the activity for the combined sample time, multiplied by the ratio of the length of the calendar quarter to the sample period.

2. Gaseous Effluents – Ground-level Release

   a. Fission and Activation Gases

      All ventilation and system vents were routed to the Unit 3 stack during the report period. Refer to the discussion for elevated releases.

   b. Iodines

      All ventilation and system vents were routed to the Unit 3 stack during the report period. Refer to the discussion for elevated releases.

   c. Particulates

      All ventilation and system vents were routed to the Unit 3 stack during the report period. Refer to the discussion for elevated releases.

3. Liquid Effluents

a. Batch Releases

Water from contaminated plant systems was collected, filtered, treated with Cesium-specific ion-exchange media, and analyzed before discharge (on a batch basis) through the liquid radwaste process monitor. Analysis of weekly composite samples from the plant effluent canal did not detect any additional release of radioactive liquids during the report period.

Samples of liquid waste batches were analyzed for the concentration of gamma-emitting nuclides (intrinsic germanium detector). All statistically important peaks were identified. All batches were analyzed for radioactive strontium (Sr-90), gross alpha, Ni-63 and tritium.

The error of the reported release values is estimated based on uncertainty in sample volume, batch volume, detector calibration, and typical sample counting statistics.

The MDA for all batch samples was less than the applicable LLD presented in the ODCM.

b. Continuous Releases

There were no continuous liquid effluent releases during this report period.

D. Batch Release Statistics

1. Liquid

a. Number of batch releases 8

b. Total time period for batch releases ..... 1.36E3 minutes

c. Maximum time period for a batch release ..... 1.77E2 minutes

d. Average time period for a batch release ..... 1.70E2 minutes

e. Minimum time period for a batch release ..... 1.59E2 minutes

2. Gaseous

a. Number of batch releases 0

b. Total time period for batch releases ..... N/A

c. Maximum time period for a batch release ..... N/A

d. Average time period for a batch release ..... N/A

e. Minimum time period for a batch release ..... N/A

E. Abnormal Release Statistics

1. Liquid

a. Number of abnormal releases 0

b. Total activity released ..... N/A

2. Gaseous

a. Number of abnormal releases 0

b. Total activity released ..... N/A

II. GASEOUS AND LIQUID EFFLUENTS

A. Gaseous Effluents

Table 1 summarizes the total quantities of radioactive gaseous effluents. Table 2A presents the quantities of each of the nuclides determined to be released from the stack (elevated release point). Table 2B presents the quantities of each of the nuclides determined to be released by other routes (ground level release points).

B. Liquid Effluents

Table 3 summarizes the total quantities of radioactive liquid effluents. Table 4 presents the quantities of each of the nuclides determined to be released.

The quantities of radionuclides released in 2006 was higher than in previous years due to the increased activity in the liquid radioactive waste system. The increase in the activity was due to the breach in the resin transfer line from the spent fuel pool demineralizer to the resin disposal tank. This breach resulted in resin being spilled into the offgas tunnel and rainwater in-leakage to the tunnel transporting the contamination into the liquid radioactive waste system. There was no unmonitored release of radioactivity from this incident.

The higher quantities of radionuclides discharged did not exceed the requirements of the ODCM with regard to effluent concentration limits or offsite doses.

HUMBOLDT BAY POWER PLANT

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT 2006

TABLE 1

GASEOUS EFFLUENTS – SUMMATION OF ALL RELEASES

	Units	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Est. Total Error, %
A. Fission & Activation Gases						
1. Total release	Ci	<5.76E1	<5.83E1	<5.89E1	<5.89E1	3.20E1
2. Average release rate	µCi/sec	<7.41E0	<7.41E0	<7.41E0	<7.41E0	
3. Percent of applicable limit	%	<1.06E-2	<1.06E-2	<1.06E-2	<1.06E-2	
4. Applicable limit	µCi/cc	7.00E-7	7.00E-7	7.00E-7	7.00E-7	
B. Particulates						
1. Total release	Ci	<3.41E-06	<3.36E-06	<3.31E-06	<3.14E-06	3.60E1
2. Average release rate	µCi/sec	<4.34E-07	<4.30E-07	<4.21E-07	<3.99E-07	
3. Percent of applicable limit	%	<3.95E-05	<3.91E-05	<3.83E-05	<3.63E-05	
4. Applicable limit	µCi/cc	1.10E-11	1.10E-11	1.10E-11	1.10E-11	
5. Gross alpha radioactivity	Ci	<1.90E-07	<1.53E-07	<1.03E-07	<9.11-08	

Note: The < symbol used in this table means that a majority of the measurements contributing to the result were less than the Minimum Detectable Activity (MDA) for the analyses. Data for individual nuclides combines detected and non-detected results as if all values were detected. The < symbol is applied if less than 50% of the combined value is made up of detected results. When combining detected and non-detected results for different nuclides (e.g. activity totals of multiple nuclides), values with the < symbol are ignored (i.e. treated as zero). When combining non-detected results for different nuclides (e.g. activity totals of multiple nuclides, when none were detected), all values with the < symbol are used.

If the total release for a period is determined to be a "less than" value, the limits are based on analytical results obtained in November, 2005, the mixture was determined to be 65% Cs-137, 9% Co-60 and 4% Sr-90, 5% Fe-55, 11% Ni-63 and 6% Pu-241.

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TABLE 2A

GASEOUS EFFLUENTS – ELEVATED RELEASE – NUCLIDES RELEASED

Nuclides Released	Unit	Continuous Mode			
		First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1. Fission Gasses					
Krypton-85	Ci	<5.83E1	<5.83E1	<5.83E1	<5.83E1
Total for period	Ci	<5.83E1	<5.83E1	<5.83E1	<5.83E1
2. Particulates					
Cobalt-60	Ci	<9.35E-07	<9.61E-07	<8.88E-07	<7.01E-07
Strontium-90	Ci	<1.06E-07	3.65E-08	<5.79E-08	<5.36E-08
Cesium-137	Ci	<7.59E-07	<7.44E-07	<7.47E-07	<7.22E-07
Am-241	Ci	<1.61E-06	<1.62E-06	<1.62E-06	<1.66E-06
Total for period	Ci	<3.41E-06	<3.36E-06	<3.31E-06	<3.14E-06

Note: The < symbol used in this table means that a majority of the measurements contributing to the result were less than the Minimum Detectable Activity (MDA) for the analyses. Data for individual nuclides combines detected and non-detected results as if all values were detected, but the < symbol is applied if less than 50% of the combined value is made up of detected results. When combining detected and non-detected results for different nuclides (e.g. activity totals of multiple nuclides), values with the < symbol are ignored (i.e. treated as zero). When combining non-detected results for different nuclides (e.g. activity totals of multiple nuclides, when none were detected), all values with the < symbol are used.

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ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT 2006

TABLE 3

LIQUID EFFLUENTS – SUMMATION OF ALL RELEASES

	Units	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Est. Total Error, %
A. Fission & Activation Products						
1. Total release (not including tritium, gases, alpha)	Ci	4.75E-3	5.10E-4	0	8.91E-04	1.00E1
2. Average diluted concentration	µCi/ml	1.99E-10	2.76E-11	0	3.75E-11	
3. Percent of applicable limit	%	2.67E-2	2.83E-03	0	2.37-03	
4. Applicable limit	µCi/ml	7.45E-07	9.75-07	0	1.58E-6	
B. Tritium						
1. Total release	Ci	8.97E-05	4.67E-5	0	1.36E-04	1.50E1
2. Average diluted concentration	µCi/ml	3.76E-12	2.53E-12	0	5.72E-12	
3. Percent of applicable limit	%	3.76E-07	2.53E-7	0	5.27E-07	
4. Applicable limit	µCi/ml	1.00E-03	1.00E-03	0	1.00E-03	
C. Gross Alpha Radioactivity						
1. Total release	Ci	1.79E-06	0	0	2.68E-06	1.00E1
D. Volume of waste released (prior to dilution)	Liters	1.02E+05	2.59E+04	0	4.67E+04	3.00E0
E. Volume of dilution water	Liters	2.38E+10	1.85E+10	2.51E+10	2.37E+10	1.50E1

Notes: The < symbol used in this table means that a majority of the measurements contributing to the result were less than the Minimum Detectable Activity (MDA) for the analyses. Data for individual nuclides combines detected and non-detected results as if all values were detected, but the < symbol is applied if less than 50% of the combined value is made up of detected results. When combining detected and non-detected results for different nuclides (e.g. activity totals of multiple nuclides), values with the < symbol are ignored (i.e. treated as zero).

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TABLE 4

LIQUID EFFLUENTS – NUCLIDES RELEASED

Nuclides Released	Unit	Batch Mode			
		First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Strontium-90	Ci	2.14E-03	2.05E-04	0	1.45E-4
Cesium-137	Ci	2.09E-03	3.37E-05	0	7.38E-05
Cobalt-60	Ci	5.33E-06	2.37E-04	0	5.99E-04
Americium-241	Ci	<2.08-05	0	0	0
Nickel-63	Ci	5.14E-04	3.37E-05	0	7.38E-5
Alpha Emitters	Ci	1.79E-06	0	0	2.68E-6
Total for period	Ci	4.75E-03	5.10E-04	0	8.91E-04

Nuclides Released	Unit	Continuous Mode			
		First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Strontium-90	Ci	N/A	N/A	N/A	N/A
Cesium-137	Ci	N/A	N/A	N/A	N/A
Cobalt-60	Ci	N/A	N/A	N/A	N/A
Americium-241	Ci	N/A	N/A	N/A	N/A
Total for period	Ci	N/A	N/A	N/A	N/A

Notes: The < symbol used in this table means that a majority of the measurements contributing to the result were less than the Minimum Detectable Activity (MDA) for the analyses. Data for individual nuclides combines detected and non-detected results as if all values were detected, but the < symbol is applied if less than 50% of the combined value is made up of detected results. When combining detected and non-detected results for different nuclides (e.g. activity totals of multiple nuclides), values with the < symbol are ignored (i.e. treated as zero).

III. SOLID RADIOACTIVE WASTE

No solid radioactive waste was disposed of during 2006.

Table 5 summarizes the disposal of solid radioactive waste made during the report period.

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TABLE 5

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. Solid Waste Shipped Offsite For Burial Or Disposal

1. Type of Waste	Unit	12 Month Period	Estimated Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	Cubic Meter	0	N/A
	Ci	0	N/A
b. Dry compressible waste, contaminated equipment, etc.	Cubic Meter	0	N/A
	Ci	0	N/A
c. Irradiated components, control rods, etc.	Cubic Meter	0	N/A
	Ci	0	N/A
d. Other (Processed Waste)	Cubic Meter	0	N/A
	Ci	0	N/A

2. Estimate of major nuclide composition (by type of waste)	Unit	Nuclide	12 Month Period
N/A	N/A	N/A	N/A

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TABLE 5 - Continued

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

2. Estimate of major nuclide composition (by type of waste)	Unit	Nuclide	12 Month Period
N/A	N/A	N/A	N/A

3. Solid Waste Disposition	Number of Shipments	Mode of Transportation	Destination
	None	N/A	N/A

B. Irradiated Fuel Shipments

1. Irradiated Fuel Disposition	Number of Shipments	Mode of Transportation	Destination
	None	N/A	N/A

IV. RADIOLOGICAL IMPACT ON MAN

A comparison of calculated doses from various paths has shown that the offsite doses are primarily due to direct radiation and to the consumption of aquatic foods. Maximum doses to individuals (for the maximally exposed organs and age groups) are summarized in Table 6. These doses comply with 40 CFR 190 as there are no other uranium fuel cycle facilities within 8 km of the Humboldt Bay Power Plant.

A. Doses to the average individual in the population from all receiving-water-related pathways were calculated for detected releases, based on the guidance of Regulatory Guide 1.109. The highest results were less than 0.01 mrem/yr (total body) for the Adult age group, and less than 0.03 mrem/yr for the bone of the Adult age group.

   These doses are well below the 10 CFR 50, Appendix I numerical guidelines for limiting effluents as low as is reasonably achievable (ALARA) (3 mrem/yr to the total body and 10 mrem/yr to any organ).

B. Total body doses to the average individual in the population from gaseous effluents to a distance of 50 miles from the site are not calculated, but this dose is less than the total body dose to an average individual present at the maximally exposed location. For an average individual at the maximally exposed location, the total body dose (calculated with the same dispersion and deposition parameters as were used to calculate maximum exposure) was less than 0.001 mrem/yr.

   This maximum calculated dose is well below the 10 CFR 50, Appendix I numerical ALARA guidelines (10 mrem/yr for gamma radiation and 20 mrad/yr for beta radiation from noble gases and 15 mrem/yr to any organ from tritium and radionuclides in particulate form).

C. Total body doses (to the average individual in unrestricted areas from direct radiation from the facility) are based on TLD results of stations at the site boundary, using the shoreline occupancy factors given in Regulatory Guide 1.109 for the highest average potential individual (Teen age group). For this group, direct radiation would result in an exposure of 0.03 mrem/yr. This is an increase over previous years due to the movement and temporary storage of radioactive components in the Unit 3 Radiologically Controlled Area.

   This maximum potential dose is well below the 10 CFR 20.1302(b)(2)(ii) limit of 50 mrem/yr from external sources necessary to demonstrate compliance with the 10 CFR 20.1301 dose limit for individual members of the public.

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TABLE 6

RADIATION DOSE FOR MAXIMALLY EXPOSED INDIVIDUALS

Dose Source	Dose, milli-rem				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Annual Total
Liquid Effluents					
Water-related Pathways (1)	<0.01 (5) 0.03 (6)	<0.01 (5) <0.01 (6)	<0.01 (5) <0.01 (6)	<0.01 (5) <0.01 (6)	<0.01 (5) 0.03 (6)
Airborne Effluents					
Particulates (2)	0.00 (7) 0.00 (7)	0.00 (7) 0.00 (7)	0.00 (7) 0.00 (7)	0.00 (7) 0.00 (7)	0.00 (7) 0.00 (7)
Noble Gases (3)	N/A	N/A	N/A	N/A	N/A
Direct Radiation (4)	0.02	<0.01	0.01	0.02	0.03

Notes

1. Maximum total body and organ doses to individuals in unrestricted areas from receiving-water-related exposure pathways were calculated from the average concentrations of liquid releases detected during the report period, following the applicable portions of Regulatory Guide 1.109 and NUREG-4013.
2. Maximum total body and organ doses to individuals in unrestricted areas from airborne-particulate-related exposure pathways were calculated from the average concentrations of airborne particulate releases detected during the report period, following the applicable portions of Regulatory Guide 1.109 and NUREG-4013.
3. Total body and skin doses to potentially exposed individuals located at the point of maximum offsite ground-level concentrations of radioactive gaseous effluents were not calculated because there were no detected releases of radioactive noble gases, and because the total body doses would be less than 0.005 milli-rem/yr at the level at which the releases could be detected.
4. Total body doses (to the maximum individual in the population) are based on TLD results of stations at the site boundary, using the shoreline occupancy factors of Regulatory Guide 1.109 for the maximum potential individual (Teen age group).
5. Total body (Adult age group).
6. Bone (Adult age group).
7. For stack releases, a majority of the results were "not detected", resulting in a total activity considered "not detected", for which no dose is calculated.

V. CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL (ODCM)

The ODCM was not revised during the report period.

VI. CHANGES TO THE PROCESS CONTROL PROGRAM (PCP)

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

VII. CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS

There were no changes to the Radioactive Waste Treatment Systems during the report period.

VIII. INOPERABLE EFFLUENT MONITORING INSTRUMENTATION

The radioactive liquid waste process monitor was inoperable for a period of 30 days or more during this reporting period.

The radioactive liquid waste process monitor was declared inoperable on February 22, 2006 due to the failure of STP 3.21.4 "Quarterly Liquid Radwaste Process Monitor Source Check and Channel Functional Test". The reason for the failure was the degradation of the electronics which resulted in the inability to properly adjust and maintain the gain of the system.

A corrective action request was written to repair or replace the monitor on March 10, 2006. After attempts to repair and replace the components of the radioactive liquid waste process monitor were unsuccessful, a new monitoring system was ordered on June 20, 2006. The new monitor was received on November 2, 2006. As of December 31, 2006, the liquid waste process monitor was still declared inoperable. However, it was subsequently tested, calibrated and declared operational on March 2, 2007.

All radioactive liquid discharges performed while the process monitor was inoperable were conducted in accordance with the ODCM requirements for such discharges.

The Stack Flow Monitor was declared inoperable from March 10, 2006 to April 29, 2006. The ODCM Table 2-3 default stack flow value of 25 Mcfm was used for this time period. The reason for the flow monitor being declared inoperable was that STP 3.16.9 "Stack Flow Monitoring System Calibration" was not performed within the ODCM allowed extension period due to procedural problems. The procedural problems were resolved and the STP was performed successfully on April 29, 2006.