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Humboldt Bay Power Plant
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March 31, 2008

PG&E Letter HBL-08-008

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 2007

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, 2007. This report is required by Section 5.7.3 of the Humboldt Bay Power Plant Unit 3 Technical Specifications.

Enclosure 2 contains Revision 14 to the "SAFSTOR Offsite Dose Calculation Manual" as required by Part I, Section 4.2 of the "SAFSTOR Offsite Dose Calculation Manual."

Sincerely,

Loren D. Sharp

cc: Elmo E. Collins, Jr.
Joe Davis
John B. Hickman
PG FossilGen HBPP Humboldt Distribution

Enclosures

NMSS01
IE48

FSME

Enclosure 1
PG&E Letter HBL-08-008

HUMBOLDT BAY POWER PLANT UNIT 3
ANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

January 1 through December 31, 2007

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

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 1, 2007 THROUGH DECEMBER 31, 2007

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HUMBOLDT BAY POWER PLANT

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT 2007

INTRODUCTION

This report summarizes gaseous and liquid radioactive effluent releases from Humboldt Bay Power Plant Unit 3 for the four quarters of 2007. 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.

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 are 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 6

b. Total time period for batch releases ..... 1.13E3 minutes

c. Maximum time period for a batch release ..... 3.41E2 minutes

d. Average time period for a batch release ..... 1.89E2 minutes

e. Minimum time period for a batch release ..... 1.40E2 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 quantity of radionuclides released in 2007 is similar to 2006, but higher than in previous years. 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 2007

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	<5.83E1	<5.83E1	<5.83E1	<5.83E1	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	<3.64E-06	<4.29E-06	<3.53E-06	<3.28E-06	3.60E1
2. Average release rate	µCi/sec	<4.30E-07	<5.46E-07	<4.48E-07	<4.51E-07	
3. Percent of applicable limit	%	<3.47E-06	<4.40E-06	<3.62E-06	<3.64E-06	
4. Applicable limit	µCi/cc	1.24E-10	1.24E-10	1.24E-10	1.24E-10	
5. Gross alpha radioactivity	Ci	<9.64E-08	<7.75E-08	<1.08E-07	<1.18-07	

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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ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT 2007

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	<1.02E-06	<1.76-06	<1.02E-06	<9.09E-07
Strontium-90	Ci	<1.37E-07	<1.23E-07	<1.75E-07	1.48E-07
Cesium-137	Ci	<7.23E-07	6.89E-07	<7.33E-07	<5.69E-07
Am-241	Ci	<1.76E-06	<1.72E-06	<1.60E-06	<1.65E-06
Total for period	Ci	<3.47E-06	<4.29E-06	<3.62E-06	<3.28E-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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TABLE 2B

GASEOUS EFFLUENTS – GROUND-LEVEL RELEASES
NUCLIDES RELEASED

Nuclides Released	Unit	Continuous Mode			
		First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1. Fission Gasses					
Krypton-85	Ci	N/A	N/A	N/A	N/A
Total for period	Ci	N/A	N/A	N/A	N/A
2. Particulates					
Cobalt-60	Ci	N/A	N/A	N/A	N/A
Strontium-90	Ci	N/A	N/A	N/A	N/A
Cesium-137	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

Note: N/A – There were no ground level gaseous effluents during the report period.

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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	2.47E-03	5.75E-04	0	2.63E-04	1.00E1
2. Average diluted concentration	µCi/ml	9.87E-11	3.12E-11	0	1.05E-11	
3. Percent of applicable limit	%	1.71E-02	5.71E-03	0	1.57-03	
4. Applicable limit	µCi/ml	5.78E-07	5.46E-07	0	6.66E-7	
B. Tritium						
1. Total release	Ci	1.61E-04	7.25E-06	0	5.88E-05	1.50E1
2. Average diluted concentration	µCi/ml	6.42E-12	3.93E-13	0	2.35E-12	
3. Percent of applicable limit	%	6.42E-07	3.93E-08	0	2.35E-07	
4. Applicable limit	µCi/ml	1.00E-03	1.00E-03	0	1.00E-03	
C. Gross Alpha Radioactivity						
1. Total release	Ci	4.90E-06	5.36E-08	0	8.22E-07	1.00E1
D. Volume of waste released (prior to dilution)	Liters	9.74E+04	2.59E+04	0	2.54+04	3.00E0
E. Volume of dilution water	Liters	2.51E+10	1.84E+10	2.55E+10	2.51E+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	1.81E-03	4.79E-04	0	1.32E-04
Cesium-137	Ci	6.59E-04	9.55E-05	0	1.30E-04
Cobalt-60	Ci	3.27E-06	3.73E-07	0	5.55E-07
Americium-241	Ci	<1.44-05	<3.16E-06	0	<3.04E-06
Nickel-63	Ci	1.55E-04	8.52E-05	0	1.54E-05
Tritium	Ci	1.61E-04	7.25E-06	0	5.88E-05
Europium-155	Ci	1.03E-06	0	0	0
Alpha Emitters	Ci	4.90E-06	5.36E-08	0	8.22E-07
Total for period	Ci	2.79E-03	6.67E-04	0	3.38E-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

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	94.4	1.00E1
	Ci	1.29	5.60E1
c. Irradiated components, control rods, etc.	Cubic Meter	11.1	1.00E1
	Ci	580	5.60E1
d. Other (soils, demolition debris etc.)	Cubic Meter	348	1.00E1
	Ci	0.311	5.60E1

2. Estimate of major nuclide composition (by type of waste)	Unit	Nuclide	12 Month Period
b. Dry compressible waste,	%	H-3	6.83E-2
contaminated equipment, etc.	%	C-14	3.49E-2
	%	Fe-55	5.14E0
	%	Co-60	1.83E1
	%	Ni-59	1.35E-1
	%	Ni-63	3.45E1
	%	Sr-90	1.30E0
	%	Tc-99	2.83E-1
	%	I-129	3.78E-2
	%	Cs-137	3.35E1
	%	U-234	1.90E-3
	%	U-238	1.84E-3
	%	Pu-238	2.78E-1
	%	Pu-239	3.32E-1
	%	Pu-241	4.20E0
	%	Am-241	1.53E-0
	%	Cm-243	3.19E-1
	%	Cm-244	1.85E-4
c. Irradiated components,	%	H-3	4.51E-2
control rods, etc.	%	C-14	2.05E-1
	%	Fe-55	1.15E-1
	%	Co-60	5.71E1
	%	Ni-59	3.35E-1
	%	Ni-63	4.19E1
	%	Sr-90	1.19E-4
	%	Zr-93	1.23E-1
	%	Nb-94	6.01E-3

	%	Tc-99	3.86E-4
	%	Sb-125	1.12E-1
	%	Cs-137	7.83E-4
	%	Pu-238	2.69E-4
	%	Pu-239	7.02E-5
	%	Pu-241	3.58E-3
	%	Am-241	5.84E-4
	%	Cm-243	9.81E-4
	%	Cm-244	2.52E-6
d. Other (Processed Waste)	%	H-3	4.93E-0
	%	C-14	1.16E-1
	%	Fe-55	8.59E-1
	%	Co-60	8.88E-1
	%	Ni-59	9.90E-3
	%	Ni-63	2.31E0
	%	Sr-90	5.43E-1
	%	Tc-99	6.85E-2
	%	Cs-137	8.85E1
	%	U-234	2.39E-1
	%	U-238	2.30E-1
	%	Pu-238	4.29E-2
	%	Pu-239	5.05E-2
	%	Pu-241	9.52E-1
	%	Am-241	2.35E-1
	%	Cm-244	2.26E-2

TABLE 5 - Continued

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

3. Solid Waste Disposition	Number of Shipments	Mode of Transportation	Destination
	22	Truck	Energy Solutions, LLC
	3	Truck	Barnwell Waste Management Facility

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 0.030 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 0.01 mrem/yr.

   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, milli-rem				
Dose Source	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Annual Total
Liquid Effluents					
Water-related Pathways (1)	<0.01 (5) 0.02 (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)	<0.01	<0.01	<0.01	<0.01	0.01

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 revised two times during the report period. The changes maintained the level of radioactive effluent control and dose commitment required by regulation, and did not adversely affect the accuracy or reliability of effluent, dose or setpoint calculations.

Revision 13 to the ODCM was reviewed by the Plant Staff Review Committee (PSRC) on 3/1/07, approved by the Plant Manager on 3/1/01, and became effective on 3/2/07. The changes in this revision were to reflect the installation of a new Radioactive Liquid Effluent Monitoring System (RLEMS) that replaced the non-repairable existing RLEMS. As a result, the ODCM was revised to:

- Reflect an updated RLEMS calibration factor obtained during the baseline calibration of the new RLEMS.
- Incorporate a new RLEMS setpoint during normal operations, identified during calculations associated with the radiological calibration of the new system.
- Lower the allowable background of the RLEMS to allow meeting the requirements of Specification 2.1.
- Table 1-1 has been modified to better reflect the effect of dilution on the alarm setpoints.

The revision also reflects a change in nomenclature to more closely follow the ODCM. (The RLEMS has been identified in the past as the Process Monitor, Liquid Process Monitor, Liquid Effluent Monitor, Liquid Process Monitoring System, and other similar names).

Revision 14 to the ODCM was reviewed by the Plant Staff Review Committee (PSRC) on 12/15/05, approved by the Plant Manager on 8/23/07, and became effective on 9/6/07. This revision to the ODCM incorporated the following changes:

- Table 2-7 – During a previous revision (REV 12) to the ODCM the Ground Water sample frequency, locations, and number of samples were inadvertently deleted. This information was re-inserted and not edited.
- Table 2-7 – Footnote (b) was deleted. This footnote unclearly explained how each phosphor in a TLD was considered to be a separate dosimeter and also stated that film badges should not be used. The number of phosphors in a TLD has nothing to do with this table. Phosphors are used to calculate TLD dose and phosphors are averaged. This is discussed in the annual reporting of these doses in the Annual Radioactive Effluent Release Report. Since film badges are no longer used, reference to them warrants removal.
- Table 2-10 – TLD Station number 33 was deleted because changing TLDs in the winter is a safety hazard due to mud and swampy conditions and. When the new generating plants are installed, more mass will exist between Unit 3 and the TLD, thus shielding the TLD. Additionally, since the Unit 3 unfiltered exhaust stack was replaced with a HEPA filter exhaust, the TLD is not subject to radiation caused by fallout of plant

radionuclides. This station is not an ODCM required TLD station. Trends from 1990 to 2006 for three TLD stations indicated no increase in background with exposure deviations within the 95% confidence levels based on the mean values for the 1990s. These TLD stations are: Station 14, at the South Bay School parking lot, and T14 and T15, located on the plant south Owner Controlled Area fence between Unit 3 and Station 33. This station is a HBPP elective station and is not one of the four ODCM required stations.

- Figure 2-3 – The locations of the following stations were deleted since they were not specified in table 2-10: 13, 16, 30, 33, & 35.
- Figure 2-4 - The locations of the following stations were deleted since they were not specified in table 2-10: 20 & 23
- Figure 2-5 – The TLD location at station 5 was deleted since it is not specified in Table 2-10

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 notification 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. The system was tested, installed, 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.