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Humboldt Bay Power Plant
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PG&E Letter HBL-12-007

10 CFR 50, Appendix I
10 CFR 50.36

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 2011

Dear Commissioners and Staff:

Enclosure 1 contains the Humboldt Bay Power Plant (HBPP), Unit 3 "Annual Radioactive Effluent Release Report," covering the period January 1 through December 31, 2011, as required by Appendix B, Section 8.3 of the Humboldt Bay Quality Assurance Plan.

Enclosure 2 contains Revision 18 of the HBPP SAFSTOR/Decommissioning Offsite Dose Calculation Manual (ODCM), effective April 4, 2011, as required by Part 1, Section 4.2 of the ODCM. All changes made in 2011, as well as the dates the changes were made, are identified in the column of the affected pages.

There are no regulatory commitments made in this letter.

Sincerely,

A handwritten signature in black ink, appearing to read 'Loren Sharp', written over a printed name.

Loren Sharp

cc: Elmo E. Collins, Jr.
John B. Hickman
HBPP Humboldt Distribution

Enclosures

LE48
FSME

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

**HUMBOLDT BAY POWER PLANT UNIT 3
ANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT**

January 1 through December 31, 2011

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INTRODUCTION

This report summarizes gaseous and liquid radioactive effluent releases from Humboldt Bay Power Plant (HBPP) Unit 3 for the four quarters of 2011. 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.

During 2008 all spent nuclear fuel was transferred from the Spent Fuel Pool to the Independent Spent Fuel Storage Installation (ISFSI). Therefore, there was no source term for noble gases for the entire year.

This information is reported as required by Appendix B, Section 8.3 of the Humboldt Bay Quality Assurance Plan 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 such that the information specified by Regulatory Guide 1.21, Appendix B, Section F, is not available. Previous HBPP Annual Radioactive Effluent Release Reports for the period of April 1962 through June 1967 (when the meteorological data logging system was in service) summarized the cumulative joint frequency distribution of wind speed, direction, and atmospheric stability.

Short-lived Nuclides

The Unit was last operated on July 2, 1976. Due to the decay time since operation, short-lived radionuclides are neither expected nor reported. This includes Iodines and noble gases. Kr-85 is no longer an issue since the spent fuel has been relocated to the ISFSI.

Air Particulate Filter Composites – Sr-90

Air particulate sample filters are composited quarterly and analyzed off-site for Sr-90.

Air Particulate Filter Composites – Am-241

Air particulate sample filters are composited quarterly and analyzed off-site for Am-241.

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 detectable levels. Because 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. Since the fuel has been relocated to the ISFSI and the Spent Fuel Pool water is below the drinking water standard, no significant tritium can be released by the gaseous mode.

Liquid Effluents – Sr-90

Batch releases are analyzed individually offsite for Sr-90, rather than analyzed as a quarterly composite as described in Regulatory Guide 1.21.

Liquid Effluents – Ni-63

Batch releases are analyzed individually offsite for Ni-63, rather than analyzed as a quarterly composite as described in Regulatory Guide 1.21.

Average Energy

For HBPP, calculations of the average energy of releases of fission product 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

Noble gases are no longer an issue since the spent nuclear fuel has been relocated to the ISFSI.

b. Iodine Release Rate Limit

The license does not define an iodine release rate limit because of the decay time since the Unit was shutdown.

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.

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 Released

1. Gaseous Effluents – Elevated Release

The original plant stack (an elevated release point) was removed in 1998 and replaced with a roof-level discharge point that is considered a ground level release point. All ventilation and system vents are routed to this release point, which is referred to as the "current" plant stack. Therefore, elevated releases did not occur at HBPP during 2011.

2. Gaseous Effluents – Ground-level Release

a. Fission and Activation Gases

Fission and activation gases are no longer an issue since the spent fuel has been relocated to the ISFSI.

b. Iodines

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

c. Particulates

A continuous air monitor equipped with an alpha spectrometer and with its response calibrated for Am-241, monitors the alpha particulate activity released from the stack. This monitor was installed in December of 2009.

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 using an intrinsic germanium detector. All statistically significant gamma peaks are identified.

After decaying at least seven days, the filters are analyzed for gross alpha radioactivity using a scintillation counter.

Filters are composited and analyzed quarterly for Strontium-90 (the only radioactive Strontium present) and Americium-241 by alpha spectroscopy.

The estimated error in 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 Lower Level of Detection (LLD) presented in the ODCM.

Samples are assigned to calendar quarters at 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.

3. Liquid Effluents

a. Batch Releases

Water from contaminated plant systems was collected, filtered, and treated with Cesium-specific ion-exchange media, and then analyzed before discharge (on a batch basis) through the liquid radwaste process monitor. During periods of inoperability of the liquid radwaste process monitor, two samples were collected and analyzed as required in the ODCM.

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

The estimated 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.

Analysis of weekly composite samples from the plant discharge canal did not detect any plant-related radioactivity, with the exceptions of the samples collected on 6/1/11 and 11/23/11. These samples showed Cs-137 concentrations of 4.58 and 8.95 pCi/L, respectively.

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: 10
- b. Total time period for batch releases: 1646 minutes
- c. Maximum time period for a batch release: 179 minutes
- d. Average time period for a batch release: 164.6 minutes
- e. Minimum time period for a batch release: 149 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 released. Table 2A is for reporting the quantities of each of these nuclides determined to be released from an elevated release point (there are none). Table 2B presents the quantities of each of the nuclides determined to be released by the stack or other routes (i.e., ground level release points).

B. Liquid Effluents

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

The quantity of radionuclides released in 2011 is similar to that released in 2010.

**TABLE 1
GASEOUS EFFLUENTS – SUMMATION OF ALL PARTICULATE RELEASES**

	Units	Continuous Mode				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Error %
Total Release	Ci	<4.95e-6	<5.22e-6	<5.31e-6	<4.98e-6	3.60E+01
Average Release Rate	μCi/sec	<6.37e-7	<6.64e-7	<6.69e-7	<6.26e-7	
Percent of Applicable Limit	%	<7.07E-6	<7.36e-6	<7.42e-6	<6.95e-6	
Applicable Limit	μCi/cc	9.01E-11	9.01E-11	9.01E-11	9.01E-11	
Gross Alpha	Ci	4.71E-08	<2.63e-7	<3.01e-7	<2.64e-7	

Table Notes:

The < symbol (less than) used in this table means that a majority of the measurements contributing to the result were less than the MDA for the analysis. The 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 (9.01e-11 μCi); based on a mixture of 84% Cs-137, 11% Co-60 and 5% Sr-90.

TABLE 2A
GASEOUS EFFLUENTS – ELEVATED RELEASES – PARTICULATES
CONTINUOUS MODE – NUCLIDES RELEASED

Nuclides Released	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
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
Am-241	Ci	N/A	N/A	N/A	N/A
Total for period	Ci	N/A	N/A	N/A	N/A

Table Notes:

N/A – There were no elevated gaseous effluents during the report period.

TABLE 2B
GASEOUS EFFLUENTS – GROUND LEVEL RELEASES – PARTICULATES
CONTINUOUS MODE – NUCLIDES RELEASED

Nuclides Released	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Co60	Ci	<1.60e-6	<2.10e-6	<1.96e-6	<1.89e-6
Sr90	Ci	<8.25e-7	<1.30e-7	<5.77e-8	<6.16e-8
Cs137	Ci	<1.44e-6	<1.8e-6	<1.95e-6	<1.81e-6
Am241	Ci	<1.1e-6	<1.19e-6	<1.35e-6	<1.22e-6
Total	Ci	<4.95e-6	<5.22e-6	<5.31e-6	<4.98e-6

Table Notes:

The < symbol used in this table means that a majority of the measurements contributing to the result were less than the 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.

TABLE 3
LIQUID EFFLUENTS – SUMMATION OF ALL RELEASES

Fission & Activation Product	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Error, % Est. Total
Not including alpha, gases & H3	Ci	1.13E-03	1.16E-03	N/A	2.19E-03	1.00E+01
Avg. Diluted Conc.	Ci/ml	3.28E-09	3.35E-09	N/A	6.36E-09	
Percent of Applicable Limit	%	4.32E-01	3.09E-01	N/A	3.80E-01	
Applicable Limit	Ci/ml	7.60E-07	1.08E-06	N/A	1.67E-06	
Tritium						
Total Release	Ci	4.00E-04	2.19E-04	N/A	1.47E-04	1.50E+01
Avg. Diluted Conc.	Ci/ml	1.16E-09	6.35E-10	N/A	4.26E-10	
Percent of Applicable Limit	%	1.16E-04	6.35E-05	N/A	4.26E-05	
Applicable Limit	Ci/ml	1.00E-03	1.00E-03	N/A	1.00E-03	
Gross Alpha						
Total Release	Ci	<4.81e-6	<2.26e-6	N/A	4.60E-06	1.00E+01
Volume of Waste released	Liters	9.69E+04	1.01E+05	N/A	4.91E+04	3.00E+00
Volume of Dilution Water	Liters	3.45E+08	3.45E+08	N/A	3.45E+08	0.00E+00

Table Notes:

1. N/A: There were no batch discharges during the 3rd quarter of 2011.
2. 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).

TABLE 4
LIQUID EFFLUENTS – NUCLIDES RELEASED – BATCH MODE

Nuclides Released	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
Sr90	Ci	6.76E-04	2.07E-04	N/A	9.81E-05	9.81E-04
Cs137	Ci	8.42E-05	5.87E-04	N/A	1.05E-03	1.72E-03
Co60	Ci	1.54E-04	1.88E-04	N/A	1.71E-04	5.13E-04
Am241	Ci	<4.23E-6	<6.51E-6	N/A	<5.14E-6	<1.59E-5
Ni63	Ci	2.18E-04	1.73E-04	N/A	8.75E-04	1.27E-03
H3	Ci	4.00E-04	2.19E-04	N/A	1.47E-04	7.66E-04
Alpha Emitters	Ci	<4.81E-6	<2.26e-6	N/A	4.60E-06	<1.17e-5
Total for Period	Ci	1.53E-03	1.37E-03	N/A	2.35E-03	5.25E-03

Table Notes:

1. N/A: There were no batch discharges during the 3rd quarter of 2011.
2. 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 reporting period.

TABLE 5
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

Solid Waste Shipped Offsite For Burial Or Disposal			
Type of Waste	Unit	12 Month Period	Estimated Total Error, %
Spent resins, filter sludges, evaporator bottoms, etc.	Cubic Meter	9.93E+00	N/A
	Ci	2.31E+00	N/A
Dry compressible waste, contaminated equipment, etc.	Cubic Meter	6.12E+02	1.00E+01
	Ci	1.32E+00	5.60E+01
Irradiated components, control rods, etc.	Cubic Meter	0.00E+00	N/A
	Ci	0.00E+00	N/A
Other (Processed Waste)	Cubic Meter	3.28E+01	N/A
	Ci	3.10E-02	N/A

TABLE 5 (continued)
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

Solid Waste Disposition	Number of Shipments	Mode of Transportation	Destination
	45	Truck - Hittman	Energy Solutions, LLC
	200	Truck - NCF/Savage	US Ecology
Irradiated Fuel Disposition	Number of Shipments	Mode of Transportation	Destination
	None	N/A	N/A

Estimate of major nuclides by waste type								
Resins, Sludges			Dry compressible waste,			Other (Processed Waste)		
Units	Nuclide	12 Month Period	Units	Nuclide	12 Month Period	Units	Nuclide	12 Month Period
%	H-3	2.96E-02	%	H-3	8.61E-01	%	H-3	2.38E+00
%	C-14	2.96E-03	%	C-14	2.59E-01	%	C-14	6.79E-02
%	Fe-55	0.00E+00	%	Fe-55	1.82E+01	%	Fe-55	1.27E+00
%	Co-60	6.18E+01	%	Co-60	5.38E+00	%	Co-60	5.34E+00
%	Ni-59	0.00E+00	%	Ni-59	1.03E+01	%	Ni-59	1.96E-01
%	Ni-63	1.16E+01	%	Ni-63	1.69E+01	%	Ni-63	1.39E+01
%	Sr-90	4.94E-01	%	Sr-90	3.38E+00	%	Sr-90	8.24E-01
%	Tc-99	2.96E-02	%	Tc-99	5.93E-01	%	Tc-99	1.63E-01
%	I-129	3.95E-04	%	I-129	1.00E-01	%	I-129	2.85E-01
%	Cs-137	2.55E+01	%	Cs-137	6.04E+00	%	Cs-137	7.10E+01
%	Eu-154	4.41E-01	%	Eu-154	0.00E+00	%	Eu-154	0.00E+00
%	U-233	0.00E+00	%	U-233	2.12E-02	%	U-233	1.12E-01
%	U-234	0.00E+00	%	U-234	2.12E-02	%	U-234	1.12E-01
%	U-238	0.00E+00	%	U-238	3.75E-02	%	U-238	2.47E-01
%	Pu-238	5.97E-03	%	Pu-238	2.78E-01	%	Pu-238	2.37E-01
%	Pu-239	9.91E-03	%	Pu-239	1.62E-01	%	Pu-239	1.46E-01
%	Pu-240	4.85E-05	%	Pu-240	1.62E-01	%	Pu-240	1.46E-01
%	Pu-241	6.97E-02	%	Pu-241	3.64E+01	%	Pu-241	2.04E+00
%	Am-241	2.01E-02	%	Am-241	7.92E-01	%	Am-241	7.29E-01
%	Cm-243	0.00E+00	%	Cm-243	1.69E-02	%	Cm-243	4.41E-01
%	Cm-244	0.00E+00	%	Cm-244	1.69E-02	%	Cm-244	4.37E-01
%	Total	1.00E+02	%	Total	9.99E+01	%	Total	1.00E+02

Table Notes:

200 shipments were made to US Ecology under a 10 CFR 20.2002 exemption. These shipments included 1.63 curies of Cs-137, 9.78e-2 curies of H-3, and 8.11e-2 curies of Co-60.

IV. RADIOLOGICAL IMPACT ON MAN

A comparison of calculated doses from various paths shows 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 HBPP.

- A. Doses to the average individual and maximally exposed individual in the population from all water-related pathways were calculated for detected releases, based on the guidance of Regulatory Guide 1.109. The highest result was < 0.01 mrem/yr for the bones of the Child Age Group. The highest result for the maximally exposed individual was 0.020 mrem/yr for the bone of the Child 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 out 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, 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 due to direct radiation from the facility) are based on the 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 <0.01mrem/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.

**TABLE 6
RADIATION DOSE FOR MAXIMALLY EXPOSED INDIVIDUALS**

Dose Source	Dose, milli-rem				
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Annual Total
Liquid Effluents					
Water-related Pathways (1)	<0.01 (5)	<0.01 (5)	N/A (3)	<0.01 (5)	<0.01 (5)
	0.01 (6)	<0.01 (6)	N/A (3)	<0.01 (6)	0.02 (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)
Direct Radiation (4)	<0.01	<0.01	<0.01	<0.01	<0.01

Table 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. Not applicable, as there were no liquid releases during this period
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 (Child age group).
7. For stack releases for all four quarters of 2011, 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 once 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.

Implementation of Design Change Notice-(DCN) D-089, "Abandon Existing Pumps and Piping at Reactor Caisson Sump," required a revision to the ODCM, revision 18. The revision was effective on 4/7/11.

DCN-D-089 abandoned the existing Caisson sump pumps and discharge piping and installed a new pump. The ODCM was revised to reflect this change. The specific changes to the ODCM were as follows: on page II-19, section 3.2.1(c), the word "pumps" was changed to "pump" and "are" was changed to "is", to be grammatically correct.

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 Effluent Monitoring System (RLEMS) was declared inoperable on 11/29/2010 and it remained out of service until 10/14/11 due to a variety of equipment problems. Duplicate sampling and analyses were performed during this period, as required by the ODCM for planned radioactive liquid discharges. Operability was restored following the replacement of the instrumentation; however, the RLEMS has continued to exhibit reliability issues that do not impact its ability to perform its intended functions. The reliability issues and the planned action to correct them are documented in SAPN (SAP notification, i.e. condition report) 1279430.

IX. ERRATA

A. The 2010 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT, PG&E letter HBL-11-002, was submitted in March 31, 2011. The report should have stated that the Stack Particulate Airborne Monitoring System (SPAMS) alpha monitor was determined to have been out of service from the date of initial operability, 12/9/2009 (ref: PG&E letter HBL-10-011), to 3/22/2010. SAPN 1260056, written on 3/23/10, SAPN 1261925, written on 6/2/2010, and SAPN 1274355, written on 7/19/2011, documented 1) this discrepancy, 2) the evaluation of potential radioactive releases during the period, and 3) task completions in order to close out the notifications. The alpha monitor was determined to have been inoperable from the time of initial design acceptance (12/9/2012) to 3/22/2010, when during the performance of Surveillance Test Procedure (STP) 3.16.10, "Calibration of the Stack Particulate-Airborne Monitoring System (SPAMS)," it was discovered that the detector was not set to perform its intended function of detecting alpha radioactivity.

The particulate filter system was in service during this time. An evaluation of the weekly stack particulate samples was performed to determine if there were any alpha conditions not recognized by the SPAMS during this period. The results of the evaluation showed that all potential airborne releases would have been below the level of detection of the stack alpha monitor.