Enclosure 1
PG&E Letter HBL-05-009

HUMBOLDT BAY POWER PLANT UNIT 3
ANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

January 1 through December 31, 2004

PACIFIC GAS AND ELECTRIC COMPANY
HUMBOLDT BAY POWER PLANT
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ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 1, 2004 THROUGH DECEMBER 31, 2004

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INTRODUCTION

This report summarizes gaseous and liquid radioactive effluent releases from Humboldt Bay Power Plant Unit 3 for the four quarters of 2004. 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 Part I, 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.

Errata For Previous Reports

None.

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 used to determine the limit is estimated by decay correcting the mixture observed prior to installing the stack HEPA filter in 1998 (nominal mixture was: 44% Co60, 4% Sr90, 52% Cs137). For this report, that mixture has been decay corrected by 6 years.

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). 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, or composites of batches, were analyzed for radioactive strontium (Sr-90), gross alpha 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 ..... 9.55E2 minutes

c. Maximum time period for a batch release ..... 1.75E2 minutes

d. Average time period for a batch release ..... 1.59E2 minutes

e. Minimum time period for a batch release ..... 1.25E2 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.

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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	<5.89E1	<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	<1.82E-06	<2.39E-06	<2.18E-06	1.75E-07	3.60E1
2. Average release rate	µCi/sec	<2.32E-07	<3.04E-07	<2.74E-07	2.20E-08	
3. Percent of applicable limit	%	<2.50E-06	<3.28E-06	<2.96E-06	7.35E-07	
4. Applicable limit	µCi/cc	9.27E-11	9.27E-11	9.27E-11	3.00E-11	
5. Gross alpha radioactivity	Ci	<3.22E-08	<4.07E-08	<4.34E-08	<4.34E-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 the typical mixture for 1998, decay corrected by approximately 6 years. For the year 2004, the mixture is estimated to be 65.8% Cs-137, 29.1% Co-60 and 5.1% Sr-90.

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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	<5.89E1	<5.89E1
Total for period	Ci	<5.83E1	<5.83E1	<5.89E1	<5.89E1
2. Particulates					
Cobalt-60	Ci	<6.27E-07	<9.06E-07	<7.92E-07	<8.72E-07
Strontium-90	Ci	<1.89E-07	<1.27E-07	<9.51E-08	1.75E-07
Cesium-137	Ci	<5.76E-07	<7.18E-07	<7.69E-07	<6.92E-07
Am-241	Ci	<3.86E-07	<6.40E-07	<5.22E-07	<1.05E-06
Total for period	Ci	<1.82E-06	<2.39E-06	<2.18E-06	1.75E-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, 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	7.66E-05	5.89E-05	0.00E+00	2.78E-05	1.00E1
2. Average diluted concentration	µCi/ml	3.01E-12	2.85E-12	0.00E+00	1.08E-12	
3. Percent of applicable limit	%	4.19E-04	4.03E-04	0.00E+00	1.30E-04	
4. Applicable limit	µCi/ml	7.19E-07	7.08E-07	0.00E+00	8.36E-07	
B. Tritium						
1. Total release	Ci	5.92E-04	5.64E-05	0.00E+00	1.74E-05	1.50E1
2. Average diluted concentration	µCi/ml	2.33E-11	2.73E-12	0.00E+00	6.76E-13	
3. Percent of applicable limit	%	2.33E-06	2.73E-07	0.00E+00	6.76E-08	
4. Applicable limit	µCi/ml	1.00E-03	1.00E-03	1.00E-03	1.00E-03	
C. Gross Alpha Radioactivity						
1. Total release	Ci	5.30E-06	1.04E-06	0.00E+00	1.11E-07	1.00E1
D. Volume of waste released (prior to dilution)	Liters	7.64E+04	5.05E+04	0.00E+00	1.81E+04	3.00E0
E. Volume of dilution water	Liters	2.55E+10	2.06E+10	2.18E+10	2.57E+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).

There were no liquid releases in the third quarter.

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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	3.00E-05	2.43E-05	0.00E+00	5.63E-06
Cesium-137	Ci	4.66E-05	3.46E-05	0.00E+00	2.19E-05
Cobalt-60	Ci	<9.64E-07	<5.40E-07	0.00E+00	2.73E-07
Americium-241	Ci	<3.20E-06	<3.20E-06	0.00E+00	<2.86E-07
Total for period	Ci	7.66E-05	5.89E-05	0.00E+00	2.78E-05

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).

There were no liquid releases in the third quarter.

III. SOLID RADIOACTIVE WASTE

Table 5 summarizes the disposal of solid radioactive waste made during the report period. The volume reported is the 'as-buried' quantity.

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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	7.53E1	1.00E1
	Ci	4.63E-2	5.60E1
c. Irradiated components, control rods, etc.	Cubic Meter	0	N/A
	Ci	0	N/A
d. Other (Processed Waste)	Cubic Meter	2.69E1	1.00E1
	Ci	6.34E-2	5.60E1

2. Estimate of major nuclide composition (by type of waste)	Unit	Nuclide	12 Month Period
d. Other (Processed Waste)	%	H-3	6.59E-4
	%	C-14	6.07E-2
	%	Fe-55	6.51E0
	%	Co-60	6.82E0
	%	Ni-59	7.24E-2
	%	Ni-63	1.96E1
	%	Sr-90	5.24E0
	%	Tc-99	4.14E-2
	%	I-129	1.76E-5
	%	Cs-137	5.39E1
	%	Pu-238	5.10E-2
	%	Pu-239	1.93E-1
	%	Pu-241	6.47E0
	%	Am-241	9.55E-1
	%	Cm-244	6.85E-2

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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
d. Other (Processed Waste)	%	H-3	6.59E-4
	%	C-14	6.07E-2
	%	Fe-55	6.53E0
	%	Co-60	6.83E0
	%	Ni-59	7.24E-2
	%	Ni-63	1.96E1
	%	Sr-90	5.24E0
	%	Tc-99	4.14E-2
	%	I-129	1.76E-5
	%	Cs-137	5.39E1
	%	Pu-238	5.10E-2
	%	Pu-239	1.93E-1
	%	Pu-241	6.47E0
	%	Am-241	9.54E-1
	%	Cm-244	6.85E-2

3. Solid Waste Disposition	Number of Shipments	Mode of Transportation	Destination
	4	Truck	Clive, Utah

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 0.001 mrem/yr (total body) for the Adult age group, and less than 0.001 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 0.001 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) <0.01 (6)	<0.01 (5) <0.01 (6)	<0.01 (5) <0.01 (6)	<0.01 (5) <0.01 (6)	<0.01 (5) <0.01 (6)
Airborne Effluents					
Particulates (2)	0.00 (9) 0.00 (9)	0.00 (9) 0.00 (9)	0.00 (9) 0.00 (9)	<0.01 (7) <0.01 (8)	<0.01 (7) <0.01 (8)
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. Total body (Child age group).
8. Bone (Child age group).
9. For stack releases in the first, second, and third quarters, a majority of the results were "not detected", resulting 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 three 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 10 to the ODCM was reviewed by the Plant Staff Review Committee (PSRC) on 12/17/03, approved by the Plant Manager on 12/17/03, and became effective on 1/8/04. This revision added a definition for "circuit failure" for the stack noble gas monitor. The definition of "loss of AC power" was appended to note 1b of Table 2-4 (in section I).

Revision 10A to the ODCM was reviewed by the Plant Staff Review Committee (PSRC) on 3/16/04, approved by the Plant Manager on 3/16/04, and became effective on 1/25/04. This minor revision changed the description to provide a street address for offsite environmental station 32 (which is an elective station, rather than one required by the ODCM).

Revision 11 to the ODCM was reviewed by the PSRC on 4/9/04, approved by the Plant Manager on 4/9/04, and was made effective on 4/21/04. The primary purpose of this revision was to compensate for a potential shift in the response of the stack noble gas detectors, identified in SAPN 1223050, summarized below.

A review of detector performance suggested that recent replacement detectors (beginning about year 2000) differ from the original detectors (installed for SAFSTOR), as the later detectors have a lower response to the internal check source (10% to 15% lower count rates), even though they have approximately the same response to the calibration sources (less than 5% change). Also, for a long term average, the system response to the calibration sources appears to be about 11% lower than the value found when the system was initially calibrated with Kr-85 gas by the manufacturer. To adapt to the reduced response for the internal source checks, the acceptance limits for those checks needed to be lowered by about 11%. To accommodate this change without adversely affecting the bias of the system response, and in order to account for the possibility of an actual reduced response to Kr-85, the system calibration factor and the calibration (surrogate) source test limits also needed be reduced by about 11%.

The revised value for the calibration factor is 3.48 E-8 μC/cc per cpm. This value is the result of dividing 3.1E-8 by 0.89 to reflect an 11% decrease in sensitivity. Note that the calibration factor is the reciprocal of sensitivity. The changes for this issue follow:

- Section II, Paragraph 1.2.2 for the Kr-85 stack gas monitor alarm point – Changed the value for "K" from 3.1E-8 to 3.48E-8 micro-Ci/cc per cpm.

- Section II, Paragraph 1.2.3 – Changed the calculated alarm point from 9,200 cpm to 8,266 cpm. The plant policy alarm setpoint of 1000 cpm is not changed.

- Appendix C – Added a section titled "Kr-85 Calibration Adjustment" to document the calibration factor change.

The secondary purpose of revision 11 to the ODCM was to clarify the sections titled "Specifications", "Specification Bases" and "Calculation Methods and Parameters" related to "Gaseous Effluents." The existing text was intended to explain that under normal conditions the Instantaneous Dose Rate limitation and the Quarterly and Annual Dose limitations were not likely to be reached, based on the assessment of the SAFSTOR Environmental Report and the NRC Final Environmental Statement (NUREG-1166), and that therefore, only unusual conditions ("accidents") would require surveillance actions and/or dose calculations. However, as identified in SAPN 1224122, this discussion belongs in the "Specification Bases" rather than in the "Specification", and the content of "Specification" should say what/when actions are required. In addition, calculation methodology has been added (to use if it is ever required), replacing the justification for not having it. Finally, Tritium is clearly treated separately (with no monitoring, since the associated calculated exposures are trivial). Individual changes follow:

- Part I, Sections 2.6.2, 2.6.3 & (new) 2.6.4 – Removed text related to the Environmental Report, and inserted language describing the actual surveillance that is performed (or not, in the case of Tritium).

- Part I, Section 2.7.2 – Moved explanatory text to BASES section 3.7, and referenced it. Revised the surveillance following an "accident involving spent fuel", removing the comparison with the Environmental Report baseline condition. Inserted language to be somewhat more specific ("majority of fuel assemblies") and then going directly to a dose calculation.

- Part I, Section 2.8.2 – Inserted clarification that no Tritium dose calculation (or baseline comparison surveillance) is required.

- Part I, Section 3.6 – Deleted the paragraph that stated that the NUREG dose assessment established that the dose rate limit is met. This may or may not be correct, and including it is not necessary to explain the basis of the limit or the basis of the surveillance.

- Part I, Section 3.6 – Revised the reasoning for not monitoring Tritium, to make it a comparison to a dose rate rather than a detection limit.

- Part I, Section 3.7 – Moved information about the calculation methodology to section 4.2, and added text (partly from section 2.7.2) explaining the basis for not routinely doing calendar year or calendar quarter dose calculations.

- Part I, Section 3.8 – Moved information about the calculation methodology to section 4.3.2/3, and added text (partly from section 4.3.1.a/b/c and 4.3.1.a/b/c explaining the basis for not routinely doing calendar year or calendar quarter dose calculations. Added the reasoning for not doing dose calculations for Tritium, since it is a negligible contribution to the total dose.

- Part II, Sections 2.1 through (new) 2.4 – Added section specifically for 31 day calculation, renumbers subsequent sections. Removed language from old 2.1 & 2.2 that (pointlessly) repeated the specification limits. Removed the text that explained calculation methodology was not required for dose determination, since the calculation methodology already exists in the ODCM, to permit dose calculations for other purposes (e.g., dose estimates for the effluent report). Added language to point to the annual dose calculation (section 2.4) with appropriate corrections for periods shorter than a year.

- Part II, Section 4.1.1 and 4.1.2 – Removed language that (pointlessly) repeated the specification limits. Removed the text that explained calculation methodology was not required for dose rate determination, since the calculation methodology already exists in the ODCM, to permit dose calculations for other purposes (e.g., dose estimates for the effluent report). Added language to identify where the methodology can be found.

- Part II, Section 4.2.1 and 4.2.2 – Removed language that (pointlessly) repeated the specification limits. Removed the text that explained calculations were not required for routine releases. Provided the calculation methodology in new formulae (4-1a) and (4-2a), adapted from the formulae in section 4.2.3. Added language to identify the basis of the methodology.

- Part II, Section 4.2.3 – Renumbered formulae (4-1) & (4-2) as (4-1b) and (4-2b) to distinguish them from the formulae in section 4.2.1.

- Part II, Section 4.3.1 and 4.3.2 – Removed language that (pointlessly) repeated the specification limits. Removed the text that explained calculations were not required for routine releases. Added language to identify the basis of the methodology.

- Part II, Section 4.3.3 – Inserted descriptive text from BASES section 3.8, about the multiple pathways considered in the calculation.

Revision 11 to the ODCM included additional miscellaneous changes...

- Section I, Limiting Condition 2.10.1 – Changed wording for calculations of direct radiation from "reactor" to "Unit No. 3", to more clearly apply the limit to actual multiple radiation sources.

- Section I, Surveillance Requirements 2.11.2 – Inserted the words "Quality Related" to more clearly distinguish the ODCM required sampling from the other sampling, which is done for various (non-ODCM) reasons and is included in the tables for informational purposes.

- Section I, Table 2-7 – Added an "X" for the California State air sample at Humboldt Hill. Added footnote (5) for that sample and for the State TLDs, indicating the activity is actually done by Humboldt Co. Health Dept.

- Section I, Table 2-10 – Revised TLD Station 32 description to reflect the name of the business at that location.

- Section II, Paragraph 1.2.2 for the Kr-85 stack gas monitor alarm point – Corrected the subscript on the total body dose factor, changing it from D_{TB} to D_A to be consistent with the term used in the formula.

- Section II, Paragraph 2.4 (previously 2.3) for the variable C_i – Changed the text to better apply the calculation to an annual basis, indicating an average concentration for a generic "period" rather than for a calendar quarter. Changed the last sentence be consistent.

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

No effluent monitoring instrumentation was INOPERABLE for periods of 30 days or more during this reporting period.