



SACRAMENTO MUNICIPAL UTILITY DISTRICT □ 6201 S Street, P.O. Box 15830, Sacramento CA 95852-1830, (916) 452-3211
AN ELECTRIC SYSTEM SERVING THE HEART OF CALIFORNIA

MPC&D 97-037

February 27, 1997

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington D.C. 20555

Docket No. 50-312
Rancho Seco Nuclear Station
License No. DPR-54

1996 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

Attention: Seymour Weiss:

In accordance with 10 CFR 50.36a(a)(2) and Rancho Seco Permanently
Defueled Technical Specification D6.9.3, the District submits the enclosed
Rancho Seco Annual Radioactive Effluent Release Report for the period
January 1 through December 31, 1996.

Members of your staff requiring additional information or clarification may
contact Einar Ronningen at (916) 452-3211, extension 4467.

Sincerely,

Steve J. Redeker
Manager
Plant Closure & Decommissioning

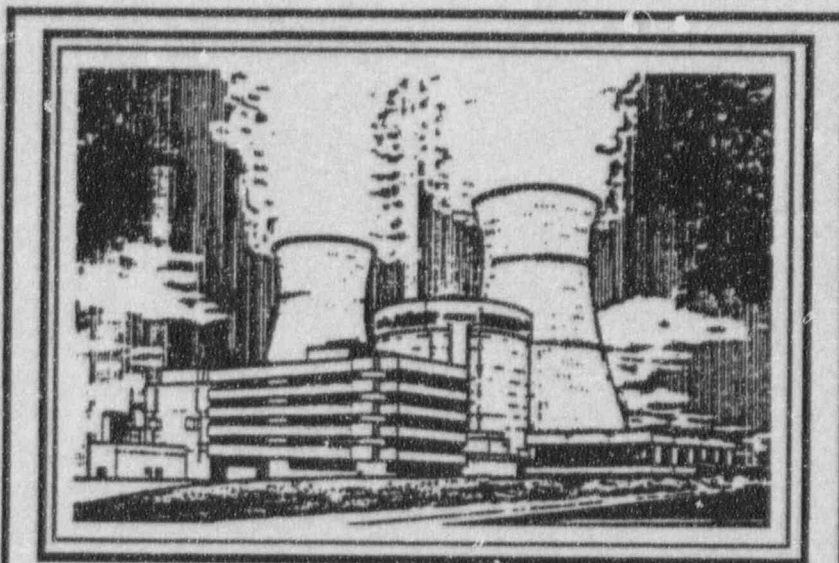
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cc w/atch: NRC Region IV Administrator, NRC, Arlington
R. Dudley, NRC, Rockville

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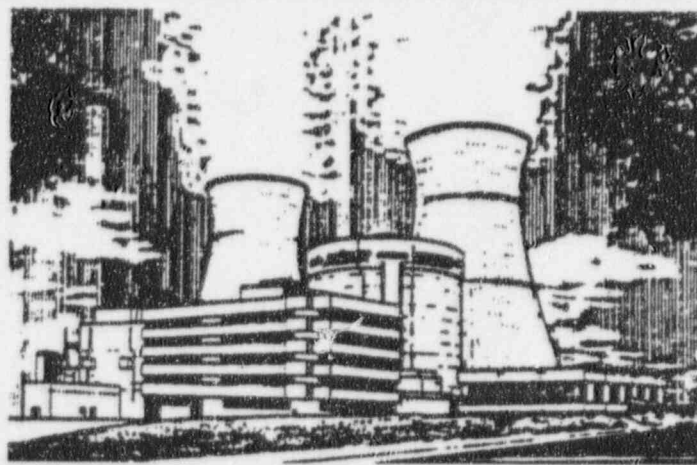


RANCHO SECO
Nuclear Generating Station

LICENSE NUMBER DPR-54

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INTRODUCTION

Rancho Seco Nuclear Generating Station (RSNGS) Unit No. 1 is located in Sacramento County, California approximately 25 miles southeast of Sacramento and 26 miles north-northeast of Stockton. Rancho Seco Unit No. 1 began commercial operation on April 17, 1975. The single unit on the Rancho Seco site is a pressurized water reactor supplied by Babcock and Wilcox. The rated capacity is 963 gross megawatts electrical. Because of a public vote on June 6, 1989, the District shutdown the Rancho Seco Nuclear Generating Station and completed defueling operations on December 8, 1989.

This Annual Radioactive Effluent Release Report (ARERR) provides a summary of gaseous and liquid effluent releases made from Rancho Seco during the period January 1 through December 31, 1996. Also presented in this report is the projected radiological impact from these releases and a summary of solid radwaste shipments.

This report has been prepared by the Sacramento Municipal Utility District to meet the requirements of Rancho Seco Technical Specification D6.9.3 and Offsite Dose Calculation Manual (ODCM) Step 6.15. It is presented in accordance with the format of USNRC Regulatory Guide 1.21. The radiation doses reported in this ARERR are calculated for a hypothetical individual who receives the maximum possible exposure at or beyond the applicable Site Boundary.

Releases of radioactivity in gaseous and liquid effluents during this report period did not exceed the limits of 10 CFR 20 or the numerical guidelines of 10 CFR 50, Appendix I. A 40 CFR 190 dose evaluation is not required because radioactive effluent releases did not exceed twice the numerical guidelines of 10 CFR 50, Appendix I.

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I. SUPPLEMENTAL INFORMATION

A. REGULATORY LIMITS & GUIDELINES FOR EFFLUENT RELEASES

1. Gaseous Effluents

- a. Noble Gas dose rate limit at or beyond the Site Boundary for Gaseous Effluents (Offsite Dose Calculation Manual (ODCM) Technical Requirement 6.14.6):

500 mrem/year to the total body
3000 mrem/year to the skin
- b. Noble Gas air dose limit at or beyond the Site Boundary for Gaseous Effluents (ODCM Technical Requirement 6.14.7, numerical guidelines of 10 CFR 50, Appendix I):

5 mrad per calendar quarter for gamma radiation
10 mrad per calendar quarter for beta radiation
10 mrad per calendar year for gamma radiation
20 mrad per calendar year for beta radiation
- c. Dose rate limit at or beyond the Site Boundary for Gaseous Effluents for Tritium and radioactive material in particulate form with half-lives greater than 8 days (ODCM Technical Requirement 6.14.6):

1500 mrem/year to any organ
- d. Dose commitment to a member of the public at or beyond the Site Boundary for Gaseous Effluents from Tritium and radioactive material in particulate form with half-lives greater than 8 days (ODCM Technical Requirement 6.14.8, numerical guidelines of 10 CFR 50, Appendix I):

7.5 mrem per calendar quarter to any organ
15 mrem per calendar year to any organ

2. Liquid Effluents

- a. The concentration of radioactive material in liquid effluents released beyond the Site Boundary for Liquid Effluents shall not exceed the limits of 10 CFR 20, Appendix B, Table 2, Column 2. This applies to all radionuclides except dissolved or entrained noble gases (ODCM Technical Requirement 6.14.2).
- b. Dose commitment to a member of the public at or beyond the Site Boundary for Liquid Effluents from radioactive materials in liquid effluents shall be limited to (ODCM Technical Requirement 6.14.3, numerical guidelines of 10 CFR 50, Appendix I):

1.5 mrem per calendar quarter to the total body
5 mrem per calendar quarter to any organ
3 mrem per calendar year to the total body
10 mrem per calendar year to any organ

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B. MAXIMUM EFFLUENT CONCENTRATIONS

1. Gaseous Effluents

The concentrations listed in 10 CFR 20, Appendix B, Table 2, Column 1 (air) are not directly used in calculations for determining permissible gaseous effluent release rates. The annual dose limits of 10 CFR 20 for unrestricted areas are the doses associated with the concentrations of 10 CFR 20, Appendix B, Table 2, Column 1. ODCM Technical Requirement dose rate limits (mrem/yr) for gaseous effluents are provided to ensure that the dose rate from gaseous effluents at any time at the Site Boundary for Gaseous Effluents will be within the annual dose limits of 10 CFR 20 for unrestricted areas. These dose rate limits (listed above in part A) are used for determining permissible gaseous effluent release rates.

2. Liquid Effluents

The concentration values listed in 10 CFR 20, Appendix B, Table 2, Column 2 are used in calculations to determine permissible liquid discharge flow rates. The most conservative Maximum Effluent Concentration (MEC) value for each radionuclide detected in the liquid effluent sample (excluding dissolved or entrained noble gases) is used in the calculations.

C. MEASUREMENT METHODS FOR TOTAL RADIOACTIVITY

1. Fission and Activation Gases

Gamma Spectroscopy (HPGe)

Liquid Scintillation (H-3)

2. Particulates

Gamma Spectroscopy (HPGe)

Beta Proportional (Sr-90, gross beta)

Alpha Proportional (gross alpha)

3. Liquid Effluents

Gamma Spectroscopy (HPGe)

Liquid Scintillation (H-3)

Beta Proportional (Sr-90, gross beta)

Alpha Proportional (gross alpha)

NOTE: HPGe refers to Hyper-Pure Germanium

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D. BATCH RELEASES (via monitored pathways)

1. Liquid (RHUT Releases)	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
a. Number of batch releases	3	2	1	3
b. Total time period for batch releases (hours)	6	9	2	6
c. Maximum time period for a batch release (hours)	2	5	2	2
d. Average time period for a batch release (hours)	2	4	2	2
e. Minimum time period for a batch release (hours)	1	4	2	1
2. Liquid (Retention Basin Discharges)				
a. Number of batch releases	1	1	1	1
b. Total time period for batch releases (hours)	6	10	15	9
c. Maximum time period for a batch release (hours)	6	10	15	9
d. Average time period for a batch release (hours)	6	10	15	9
e. Minimum time period for a batch release (hours)	6	10	15	9
f. Average stream flow during periods of release of effluent into a flowing stream (cfs)	19.7	15.6	15.3	14.9

NOTE: The Regenerant Holdup Tanks (RHUTs) are released to the Retention Basins. The Retention Basins are discharged offsite. All 10 CFR 50, Appendix I dose calculations are based on the RHUT releases. All 10 CFR 20 calculations are based on the Retention Basin discharges.

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E. UNPLANNED RELEASES

This section describes unplanned releases of radioactivity in liquid and gaseous effluent.

Gaseous

None

Liquid

None

F. RADIOACTIVE EFFLUENT MONITORING INSTRUMENTATION INOPERABLE FOR GREATER THAN 30 DAYS

None

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II. ESTIMATION OF ERROR

The methods for establishing error estimates included review of applicable station procedures, inspection of sampling equipment, engineering estimates, statistical applications, review of calibration setpoint data, and communication with plant personnel. The various sources of error (s) in reported values of gaseous effluents, liquid effluents, and solid waste are assumed to be independent, and thus the total error is calculated according to the formula:

$$\text{Total Error} = \sqrt{\sigma_1^2 + \sigma_2^2 + \sigma_3^2 \dots + \sigma_i^2}$$

where: σ_i = relative error associated with component i

Sources of error for gaseous effluents include fan error (flow), grab sampling, collection, filter efficiency, counting, and calibration.

Sources of error for liquid effluents include RHUT volume, dilution water flow rate, grab sampling, counting, and calibration.

Sources of error for solid waste include offsite lab smear analysis, dose rate meter calibration, dose rate meter reading, Wastetrak dose-to-curie calculation, sample volume measurement, gamma spec counting, gamma spec calibration, and waste volume determination.

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III. GASEOUS EFFLUENTS

Table III-A, Gaseous Effluents - Summation of All Releases, provides a detailed summary of gaseous effluent releases per quarter. This table summarizes releases of fission and activation gases, particulates with half-lives greater than 8 days, and tritium. The methodology used to calculate the Percent of ODCM Technical Requirement limit is as follows:

$$\% \text{ Tech Req Limit} = \frac{\sum_i [(F_i)(\text{Avg Rel Rate})(X/Q)(\text{Dose Factor})]}{(\text{Dose Rate Limit})} \times 100\%$$

where:

F_i = The fraction of the total number of Curies of nuclide i out of the total curies in that category for that quarter (unitless).

NOTE: F_i always equals 1.0 for H-3 because it is the only nuclide in the category.

$$\text{Avg Rel Rate} = \frac{(\text{Total Curies per category per quarter}) \left(\frac{1 \text{ E} + 06 \text{ } \mu\text{Ci}}{\text{Ci}} \right)}{(\# \text{ seconds in the quarter})}$$

X/Q = A default dispersion factor determined to be conservative when compared to the use of actual data (sec/m³).

Dose Factor = The values derived for each nuclide i from NRC Regulatory Guide 1.109 (K_i , $Li+1.1Mi$, or $Raij$). [Units in (mrem/yr)/($\mu\text{Ci}/\text{m}^3$)]

Dose Rate Limit = The Technical Requirement (i.e., Regulatory) limits for dose rate listed in Section I of this report (mrem/yr).

NOTE: Particulates with half-lives less than 8 days are not included in this calculation.

The methodology used to calculate the Estimated Total Error (%) in Table III-A is presented in Section II of this report.

Table III-B, Gaseous Effluents - Ground Level Releases, provides a complete quarterly summary of the amount of radioactivity (Ci) released per radionuclide in each quarter. Data from continuous and batch releases are provided for fission gases, particulates, and tritium. Data reported for batch releases results only from unplanned releases.

Table III-C, Gaseous Effluents - Typical Lower Limits of Detection, provides a listing of the typical lower limit of detection (LLD) concentrations in $\mu\text{Ci}/\text{cc}$ for various radionuclides.

Table III-D, Radiological Impact on Man Due to Gaseous Effluent Releases, provides a summary of calculated radiation doses delivered to a maximum exposed hypothetical individual at the Site Boundary for Gaseous Effluents (actual doses will be assessed in the 1996 Annual REMP Report). The maximum calculated organ dose, gamma air dose, and beta air dose are listed for each quarter along with an annual total. The dose due to direct radiation based on Thermoluminescent Dosimeter (TLD) results is also listed. Presented in this table for each category is a comparison versus ODCM Technical Requirement dose limits with the exception of direct radiation measurements.

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TABLE III-A

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>	<u>Est. Total Error, %</u>
A. Fission & Activation Gases (i.e. Noble Gases)						
1. Total Release	Ci	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	N/A
2. Average Release Rate for period	μCi/sec	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	
3. Percent of Tech Req limit	%	N/A	N/A	N/A	N/A	
B. Particulates						
1. Particulates with half-lives>8 days	Ci	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.5 E+01
2. Average Release Rate for period	μCi/sec	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	
3. Percent of Tech Req limit	%	N/A	N/A	N/A	N/A	
4. Gross Alpha radioactivity ¹	Ci	0.00 E-00	1.56 E-07	5.86 E-08	1.17 E-08	
C. Tritium						
1. Total Release	Ci	2.97 E-01	4.07 E-01	4.43 E-01	4.78 E-01	2.5 E+01
2. Average Release Rate for period	μCi/sec	3.82 E-02	5.18 E-02	5.57 E-01	6.01 E-02	
3. Percent of Tech Req limit	%	3.23 E-04	4.38 E-04	4.72 E-04	5.09 E-04	

Note 1: Gross alpha activity has been determined to be naturally occurring and not the result of the fuel cycle.

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TABLE III-B

GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

Nuclides Released	Unit	Continuous Mode			
		<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
1. Fission Gases (i.e., Noble Gases)					
None					
2. Particulates					
None					
3. Tritium					
H-3	Ci	2.97 E-01	4.07 E-01	4.43 E-01	4.78 E-01

NOTE: Batch releases of gaseous effluent are no longer planned to be made from Rancho Seco Nuclear Generating Station.

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TABLE III-C

GASEOUS EFFLUENTS - TYPICAL LOWER LIMITS OF DETECTION

<u>RADIONUCLIDES</u>	<u>LLD ($\mu\text{Ci/cc}$)</u>
1. Tritium (H-3)	2.27 E-10
2. Fission & Activation Gases:	
Krypton-85	3.47 E-06
3. Particulates:	
Manganese-54	2.08 E-12
Cobalt-58	2.29 E-12
Iron-59	5.89 E-12
Cobalt-60	3.11 E-12
Strontium-89	2.00 E-15
Strontium-90	5.00 E-15
Cesium-134	1.52 E-12
Cesium-137	1.88 E-12
Barium-140	3.06 E-12
Cerium-141	1.15 E-12
Cerium-144	3.69 E-12

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TABLE III-D

RADIOLOGICAL IMPACT ON MAN DUE TO GASEOUS EFFLUENT RELEASES

CALCULATED RADIATION DOSES AT THE SITE BOUNDARY FOR GASEOUS EFFLUENTS:

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>	<u>1996 Annual</u>
A. Tritium, Particulate						
1. Maximum Organ Dose	mrem	9.64 E-03 (a)	1.32 E-02 (a)	1.44 E-02 (a)	1.55 E-02 (a)	5.72E-02 (a)
Percent Tech Req limit	%	1.29 E-01	1.76 E-01	1.92 E-01	2.07 E-01	3.52E-01
B. Noble Gas						
1. Gamma Air Dose	mrad	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Percent Tech Req limit	%	N/A	N/A	N/A	N/A	N/A
2. Beta Air Dose	mrad	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Percent Tech Req limit	%	N/A	N/A	N/A	N/A	N/A
C. Direct Radiation						
1. Dose (TLD results)	mrem	0.00 E+00*	0.00 E+00*	0.00 E+00*	0.00 E+00*	0.00 E+00*
2. Percent of Tech Req limit	%	N/A	N/A	N/A	N/A	N/A

(a) Child - All Except Bone

NOTE: The quarterly doses listed above were calculated using dose factors from GASPAR and default meteorological data for each quarter. Annual doses are the sum of quarterly doses.

* Averages of all doses at TLD Indicator Stations are less than the averages for all control stations for this Period. None of the Indicator stations indicate significant radiation attributable to Plant operations.

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IV. LIQUID EFFLUENTS

Table IV-A, Liquid Effluents - Summation of All Releases, provides a detailed summary of liquid effluent releases per quarter. This table summarizes releases of fission and activation products, tritium, dissolved and entrained gases, and gross alpha radioactivity. Also listed is the volume of waste released prior to dilution and the volume of dilution water used during each quarter.

The following methodology is used to calculate the Average Diluted Concentration and the Percent of ODCM Technical Requirement Limit in Table IV-A:

$$\% \text{ Tech Req Limit} = \sum_i^n \left[\frac{C_i}{\text{MEC}_i} \right]$$

where: n = The total number of radionuclides identified
 C_i = The average diluted concentration of radionuclide i

$$= \frac{(\text{Total Release per Category per Quarter in } \mu\text{Ci})}{(\text{Total Release Volume (part F in Table IV - A) in ml})}$$

MEC_i = The MEC of the i th radionuclide, from 10 CFR 20, Appendix B, Table 2, Column 2

The methodology used to calculate the estimated total error in Table IV-A is presented in Section II of this report.

Table IV-B, Liquid Effluents, provides a complete quarterly summary of the amount of radioactivity (C_i) released per radionuclide in each quarter. Data is provided for fission and activation products, and for dissolved and entrained gases. Tritium and gross alpha are not included in this table (they are listed in Table IV-A). Since no continuous releases of liquid radioactive effluent are made from RSNGS, data is provided only for batch releases.

Table IV-C, Liquid Effluents - Typical Lower Limits of Detection, provides a listing of the typical lower limit of detection (LLD) concentrations in $\mu\text{Ci/ml}$ for various radionuclides.

Table IV-D, Radiological Impact on Man Due To Liquid Effluent Releases, provides a summary of calculated radiation doses delivered to a maximum exposed hypothetical individual at the Site Boundary for Liquid Effluents (actual doses will be assessed in the 1996 Annual REMP Report). The maximum calculated total body dose and organ dose are listed for each quarter along with an annual total. A comparison versus ODCM Technical Requirement dose limits is also presented.

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TABLE IV-A

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>	<u>Est. Total Error, %</u>
A. Fission & Activation Products						
1. Total Release (not including tritium, gases, alpha)	Ci	1.52 E-05	1.04 E-05	4.26 E-06	2.06 E-05	2.3 E+01
2. Average diluted concentration during period	μCi/ml	3.49 E-12	3.00 E-12	1.24 E-12	6.13 E-12	
3. Percent of Tech Req limit	%	3.42 E-04	2.97 E-04	1.24 E-04	6.13 E-04	
B. Tritium						
1. Total Release	Ci	1.73 E-03	5.98 E-04	0.00 E+00	1.07 E-03	2.3 E+01
2. Average diluted concentration during period	μCi/ml	3.99 E-10	1.72 E-10	0.00 E+00	3.19 E-10	
3. Percent of Tech Req limit	%	3.99E-05	1.72 E-05	N/A	3.19 E-05	
C. Dissolved and Entrained Gases (i.e., Noble Gases)						
1. Total Release	Ci	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	N/A
2. Average diluted concentration during period	μCi/ml	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	
D. Gross Alpha radioactivity						
1. Total Release	Ci	2.39 E-07	0.00E+00	0.00E+00	0.00E+00	2.3 E+01
E. Volume of Waste Released						
Retention Basins (prior to dilution)	Liters	1.04 E+06	1.12 E+06	1.17 E+06	1.37 E+06	5.0 E+00
RHUTs (prior to dilution)	Liters	7.19 E+05	3.94 E+05	1.65 E+05	8.48 E+05	5.0 E+00
F. Volume of dilution water used during period						
	Liters	4.34 E+09	3.48 E+09	3.44 E+09	3.36 E+09	2.0 E+01

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TABLE IV-B
LIQUID EFFLUENTS

<u>Nuclides Released</u>		<u>Batch Mode</u>			
		<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
1. <u>Fission and activation products</u> <u>(excluding tritium, gases alpha)</u>	<u>Unit</u>				
Co-60	Ci	4.56E-07	0.00 E+00	0.00 E+00	0.00 E+00
Sr-89 ¹	Ci	0.00 E+00	1.40 E-07	0.00 E+00	0.00 E+00
Sr-90	Ci	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Cs-134	Ci	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Cs-137	Ci	1.47 E-05	1.03 E-05	4.26 E-06	2.06 E-05
Total for period (above)	Ci	1.52 E-05	1.04 E-05	4.26 E-06	2.06 E-05
2. <u>Dissolved and entrained gases</u>					
None					

NOTE: No continuous releases of liquid radioactive effluent are made from Rancho Seco Nuclear Generating Station.

Note 1: The detection of Sr-89 is suspected to be a statistical anomaly due to the short half-life and lack of a production mechanism since 1989.

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TABLE IV-C

LIQUID EFFLUENTS - TYPICAL LOWER LIMITS OF DETECTION

<u>RADIONUCLIDES</u>	<u>BATCH MODE: LLD ($\mu\text{Ci/ml}$)</u>
1. Tritium (H-3)	2.60 E-06
2. Particulates:	
Manganese-54	2.11 E-09
Iron-59	3.71 E-09
Cobalt-57	2.12 E-09
Cobalt-58	1.93 E-09
Cobalt-60	1.98 E-09
Zinc-65	4.34 E-09
Strontium-90	5.00 E-10
Ruthenium-106	1.79 E-08
Silver-110m	1.94 E-09
Antimony-125	5.78 E-09
Cesium-134	1.93 E-09
Cesium-136	2.23 E-09
Cesium-137	2.30 E-09
Barium-140	7.75 E-09
Cerium-141	3.60 E-09
Cerium-144	1.59 E-08
3. Dissolved and Entrained Gases:	
Krypton-85	4.87 E-07

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TABLE IV-D

RADIOLOGICAL IMPACT ON MAN DUE TO LIQUID EFFLUENT RELEASES

CALCULATED RADIATION DOSE COMMITMENTS FOR LIQUID EFFLUENTS:

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>	<u>1996 Annual</u>
A. Maximum Total Body Dose	mrem	3.86 E-03	3.39 E-03	1.43 E-03	7.13 E-03	1.58 E-02
		(a)	(a)	(a)	(a)	(a)
Percent Tech Req limit	%	2.57 E-01	2.26 E-01	9.53 E-02	4.75 E-01	5.27 E-01
B. Maximum Organ Dose	mrem	8.20 E-03	7.27 E-03	3.06 E-03	1.52 E-02	3.37 E-02
		(b)	(b)	(b)	(b)	(b)
Percent Tech Req limit	%	1.64 E-01	1.45 E-01	6.12 E-02	3.04 E-01	3.37 E-01

- (a) Adult
(b) Child - Bone

Note: The quarterly doses listed above were calculated using dose factors from LADTAP and the average dilution flow (cfs) for each respective quarter. Annual doses are the sum of quarterly doses.

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V. SOLID WASTE

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

No shipments of radioactive waste were made to a disposal site during the reporting period.

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments

None

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ADDENDUM

CORRECTIONS TO THE 1995 ARERR

On February 9, 1995, the power supply for the flow dampers in one of the gaseous effluent flow paths was removed in error. A subsequent flow test of this pathway measured a flow rate greater than the default flow rate in use at the time. The power supply for the dampers has since been replaced, but the default flow rate, which is intended to be conservative, has been recalculated to account for the potential loss of the power supply. The new default flow rate was made retroactive to February 9, 1995, and the offsite impact has been reevaluated back to the same date. The effluent flow path involved was only operated intermittently during 1995, resulting in small changes to the effluent data previously reported. The release data affected by the new default flow rate, indicated by shading, is included in the attached pages.

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TABLE III-A

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>	<u>Est. Total Error, %</u>
A. Fission & Activation Gases (i.e. Noble Gases)						
1. Total Release	Ci	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	N/A
2. Average Release Rate for period	μCi/sec	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	
3. Percent of Tech Req limit	%	N/A	N/A	N/A	N/A	
B. Particulates						
1. Particulates with half-lives>8 days	Ci	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.5 E+01
2. Average Release Rate for period	μCi/sec	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	
3. Percent of Tech Req limit	%	N/A	N/A	N/A	N/A	
4. Gross Alpha radioactivity ¹	Ci	4.24E-08	1.26E-07	4.70E-08	3.78E-07	
C. Tritium						
1. Total Release	Ci	6.95E-01	7.04E-01	2.28E+00	3.91E-01	2.5 E+01
2. Average Release Rate for period	μCi/sec	8.94E-02	8.95E-02	2.87E-01	4.92E-02	
3. Percent of Tech Req limit	%	7.57E-04	7.58E-04	2.43E-03	4.16E-04	

Note 1: Gross alpha activity has been determined to be naturally occurring and not the result of the fuel cycle.

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TABLE III-B

GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

Nuclides Released	Unit	Continuous Mode			
		<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
1. Fission Gases (i.e., Noble Gases)					
None					
2. Particulates					
None					
3. Tritium					
H-3	Ci	6.95E-01	7.04E-01	2.28E+00	3.91E-01

NOTE: Batch releases of gaseous effluent are no longer planned to be made from Rancho Seco Nuclear Generating Station.

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TABLE III-D

RADIOLOGICAL IMPACT ON MAN DUE TO GASEOUS EFFLUENT RELEASES

CALCULATED RADIATION DOSES AT THE SITE BOUNDARY FOR GASEOUS EFFLUENTS:

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>	<u>1995 Annual</u>
A. Tritium, Particulate						
1. Maximum Organ Dose	mrem	2.25E-02	2.29E-02	7.38E-02	1.27E-02	1.32E-01
		(a)	(a)	(a)	(a)	(a)
Percent Tech Req limit	%	3.00E-01	3.05E-01	9.84E-01	1.69E-01	8.79E-01
B. Noble Gas						
1. Gamma Air Dose	mrad	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Percent Tech Req limit	%	N/A	N/A	N/A	N/A	N/A
2. Beta Air Dose	mrad	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
Percent Tech Req limit	%	N/A	N/A	N/A	N/A	N/A
C. Direct Radiation						
1. Dose (TLD results)	mrem	0.00 E+00*	0.00 E+00*	0.00 E+00*	0.00 E+00*	0.00 E+00*
2. Percent of Tech Req limit	%	N/A	N/A	N/A	N/A	N/A

(a) Child - All Except Bone

NOTE: The quarterly doses listed above were calculated using dose factors from GASPAR and default meteorological data for each quarter. Annual doses are the sum of quarterly doses.

* Averages of all doses at TLD Indicator Stations are less than the averages for all control stations for this Period. None of the Indicator stations indicate significant radiation attributable to Plant operations.