

ATTACHMENT

Consumers Power Company
Palisades Plant
Docket 50-255

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE
AND WASTE DISPOSAL REPORT
JANUARY THROUGH JUNE 1989

August 31, 1989

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PDR ADOCK 05000255
R PDR

130 Pages

OC0889-0184-NL04

To TCBordine, P24-608
From WLBeckman
Date August 23, 1989
Subject PALISADES PLANT-
SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY-JUNE 1989
CC CSKozup (w/o attachments)
MLGrogan
Effluent File(s)
DCC: 950/24*03*10/LP
950/22*07*01*01/LP

CONSUMERS
POWER
COMPANY

Internal
Correspondence

WLB89*062

Please find the subject report prepared and reviewed in accordance with Palisades Procedure HP 10.5. This report is believed accurate, pertinent and complete to the best of our ability in meeting the requirements of 10 CFR 50.36(a) and Palisades Technical Specification Section 6.9.3.1a.

The report was prepared by the Palisades RMC Supervisor with technical review assigned to JHager, RMC/RSD.

Upon approval, this report is sent to the General Office Nuclear Licensing Department for issuance to Region III, USNRC.

Technical Review performed by:

J Hager
JHager, Nuclear Operations Analyst

8/28/89
Date

Admin Review performed by:

TPNeal
TPNeal, RMC Administrator

8/28/89
Date

Report approved by:

WLBeckman
WLBeckman, Radiological Services Manager

8/28/89
Date

Palisades Nuclear Plant Semiannual
Radioactive Effluent Release Report

January - June 1989

This report provides information relating to radioactive effluent releases and solid radioactive waste processing at the Palisades Nuclear Plant during the period of January through June 1989. The report format is detailed in Plant Technical Specification 6.9.3.1a. Palisades has been online from January 1 to January 30, offline from January 30 to March 1, then online from March 1 through June 1989.

1. Supplemental Information

A. Batch Releases

Information relating to batch releases of gaseous and liquid effluents is provided in Table HP 10.5-1.

B. Abnormal Releases

None.

2. Gaseous Effluents

Table HP 10.5-2 lists and summarizes all gaseous radioactive effluents released during the reporting period. The unidentified beta was 1.55E-04% of the total release.

3. Liquid Effluents

Table HP 10.5-3 lists and summarizes all liquid radioactive effluents released during the reporting period. The unidentified beta was 1.10E-03% of the total release.

4. Solid Waste

Solid radwaste classification, sources, volume shipped, curie and nuclide content are detailed in Table HP 10.5-4. All radwaste shipments were made to either Barnwell, South Carolina or Richland, Washington for burial.

5. Summary of Radiological Impact on Man

Potential doses to individuals and populations were calculated using GASPAR and LADTAP computer program codes. The first and second quarter values for curies released were input for each nuclide and summarized as follows:

- A. The offsite air dose at the site boundary (0.48 SSE) due to noble gases was 1.44E-03 millirad beta and 7.01E-04 millirad gamma for the first quarter; and 6.14E-04 millirad beta and 3.53E-04 millirad gamma for the second quarter. The maximum noble gas offsite air dose to the nearest residence (0.5 mi S) occurred during the first quarter, being 1.01E-03 millirads beta and 4.91E-04 millirads gamma.

- B. The most restrictive organ dose to an individual in an unrestricted area (based on identified critical receptors) from gaseous effluent releases (tritium, particulate and iodine) was the child bone for the first and second quarters. Doses were $2.26E-02$ and $3.46E-03$ millirem, respectively.
- C. Integrated total body doses to the general population and average doses to individuals (adults) within the population from gaseous effluent releases within a distance of 50 miles from the site boundary were: $1.31E-02$ manRem and $1.25E-05$ millirem for the first quarter; and $4.55E-03$ manRem and $4.33E-06$ millirem for the second quarter.
- D. The maximum total body dose to an individual (adult) in unrestricted water-related exposure pathways was $8.91E-04$ and $7.00E-04$ millirems for the first and second quarters, respectively. The maximum organ doses were $1.75E-03$ millirem (teenage bone) for the first quarter and $1.28E-03$ millirem (teenage bone) for the second quarter.
- E. Integrated total body doses to the general population and average doses to individuals (adults) within the population from liquid effluent releases within a distance of 50 miles from the site boundary were: $3.34E-03$ manRem and $3.18E-06$ millirem for the first quarter; and $2.61E-03$ manRem and $2.49E-06$ millirem for the second quarter.
- F. The Selenium-75 present in the gaseous effluent releases (first and second quarters) and Xe-133m (first quarter) were not significant in either wholebody or organ doses.

6. Process Control Program (PCP)

The following change was made to the verification statement on Page 5 of PCP. We now require every drum produced to be checked for free water and solidification instead of every tenth drum. A copy of the entire PCP is attached.

7. Offsite Dose Calculation Manual (ODCM)

The following changes were made to the Offsite Dose Calculation Manual (ODCM) during the period:

- A. Page 2 - clarification "allowed to measured".
- B. Page 3 - paragraph clarified.
- C. Page 7 - delete erroneous $3.17E-02$ term from equation 1.6 and change units to mRad/yr from mRem/yr.
- D. Page 8 - added missing age groups.
- E. Pages 11 & 14 - change tb to 15y to agree with NuReg 0172.

- F. Page 16 - added Qf values for cow and goat.
- G. Page 16 - added meat ingestion which was omitted from original.
- H. Page 17 - added D_f to equation 1.17.
- I. Page 18 - corrected wording.
- J. Pages 37 & 38 - updated Tables 1.4 and 1.4a to include 1988 data.
- K. Pages 41-57 - replaced Table 1.7 with data from NuReg 0172.
- L. Page 61 - correct typo.
- M. Page 62 - correct typo.
- N. Page 63 - added description of composite samplers.
- O. Pages 66 & 67 - correction factors to change uCi to pCi.
- P. Page 68 - correct Rem to mRem.
- Q. Pages 76-91 - replace Table 2.1 to values from NuReg 0172.
- R. Page 92 - correct value for Sr-90 (more conservative) as original Table 2.1 data was outdated.

These changes make the ODCM a more accurate document. A complete ODCM is attached.

8. Supplemental Information for the July-December 1988 Semiannual Radioactive Effluent Release Report

Revision of tritium values on Table 10.5-2 is attached. The revision was necessary because of a procedure error which has been corrected.

TABLE HP 10.5-1

PALISADES NUCLEAR PLANT SEMIANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

BATCH RELEASES

JANUARY 1989 to JUNE 1989

A. GASEOUS	Units	1st Quarter	2nd Quarter
Number of Releases		18	11
Total Release Time	Minutes	5.88E+03	2.58E+03
Maximum Release Time	Minutes	5.00E+02	4.50E+02
Average Release Time	Minutes	3.27E+02	2.34E+02
Minimum Release Time	Minutes	1.65E+02	5.80E+01
B. LIQUID	Units	1st Quarter	2nd Quarter
Number of Releases		5	4
Total Release Time	Minutes	2.56E+03	3.32E+03
Maximum Release Time	Minutes	7.35E+02	1.36E+03
Average Release Time	Minutes	5.12E+02	8.29E+02
Minimum Release Time	Minutes	3.75E+02	5.20E+02

TABLE HP 10.5-2

PALISADES NUCLEAR PLANT SEMIANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

GASEOUS EFFLUENTS - SUMMATION OF RELEASES ***

JANUARY 1989 to JUNE 1989

				Est Total
A. FISSION AND ACTIVATION GASES	UNITS	1st QUARTER	2nd QUARTER	Error %
1. Total release	Ci	2.88E+01	1.18E+01	
2. Average release rate for period	uCi/sec	3.70E+00	1.50E+00	5.24
3. Percent of annual avg MPC	%	2.17E-03	1.06E-03	
<hr/>				
B. IODINES				
1. Total Iodine	Ci	2.53E-03	2.91E-04	
2. Average release rate for period *	uCi/sec	3.25E-04	3.70E-05	12.7
3. Percent of annual avg MPC *	%	4.16E-04	2.82E-05	
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C. PARTICULATES				
1. Particulates with half-life > 8 days	Ci	1.63E-04	2.07E-05	
2. Average release rate for period	uCi/sec	2.10E-05	2.63E-06	
3. Percent of annual avg limit MPC	%	3.85E-05	5.56E-06	27.9
4. Gross alpha radioactivity	Ci	2.17E-06	1.64E-06	
5. Gross alpha average release rate for period	uCi/Sec	2.79E-07	2.09E-07	
<hr/>				
D. TRITIUM				
1. Total release	Ci	2.11E+00	1.43E+00	
2. Average release rate for period	uCi/sec	2.71E-01	1.82E-01	
3. Percent of annual avg MPC	%	1.94E-04	1.30E-04	
<hr/>				
E.				
1. Beta air dose at site boundary due to Noble Gases (TS 3.24.5.2a)	mRads	1.44E-03	6.14E-04	
2. Percent limit	%	1.44E-02	6.14E-03	
3. Gamma air dose at site boundary due to Noble Gases (TS 3.24.5.21)	mRads	7.01E-04	3.53E-04	
4. Percent limit	%	1.40E-02	7.06E-03	
<hr/>				
F.				
1. Maximum organ dose to public based based on critical receptors (TS 3.24.5.3)	mRem	2.26E-02	3.46E-03	
2. Percent of limit	%	3.01E-01	4.61E-02	
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Note: Data is reported for I-131 and I-133 only.				
Note: Large error factor due to small amount of particulates present in gaseous effluents.				

TABLE HP 10.5-2

PALISADES NUCLEAR PLANT SEMIANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

GASEOUS EFFLUENTS

JANUARY 1989 to JUNE 1989

1. FISSION GASES	Units	1st QUARTER	2nd QUARTER
Krypton-85	Ci	None	None
Krypton-85m	Ci	1.92E-02	1.70E-02
Krypton-87	Ci	3.43E-02	3.64E-02
Krypton-88	Ci	7.17E-02	4.44E-02
Xenon-131m	Ci	1.50E-02	4.52E-03
Xenon-133	Ci	2.78E+01	1.10E+01
Xenon-133m	Ci	9.93E-03	7.49E-03
Xenon-135	Ci	2.28E-01	1.84E-01
Xenon-135m	Ci	2.71E-01	3.17E-01
Xenon-138	Ci	1.01E-01	1.33E-01
Argon-41	Ci	2.21E-01	3.68E-02
Total for Period	Ci	2.88E+01	1.18E+01
<hr/>			
2. IODINES			
Iodine-131	Ci	2.17E-03	1.10E-04
Iodine-132	Ci	None	None
Iodine 133	Ci	3.60E-04	1.81E-04
Iodine-135	Ci	None	None
Total for Period	Ci	2.53E-03	2.91E-04

TABLE HP 10.5-2

PALISADES NUCLEAR PLANT SEMIANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

GASEOUS EFFLUENTS

JANUARY 1989 to JUNE 1989

3. PARTICULATES *	Units	1st QUARTER	2nd QUARTER
Chromium-51	Ci	None	None
Manganese-54	Ci	None	None
Cobalt-58	Ci	3.72E-07	None
Cobalt-60	Ci	2.36E-06	None
Niobium-95	Ci	None	None
Selenium-75	Ci	1.77E-05	8.41E-06
Cesium-134	Ci	1.60E-05	None
Cesium-137	Ci	6.98E-05	3.35E-06
Strontium-89 **	Ci	4.5E-07	6.0E-07
Strontium-90 **	Ci	3.8E-07	1.2E-06
Net Unidentified Beta	Ci	5.64E-05	7.11E-06
Total	Ci	1.63E-04	2.07E-05

* Note: Particulates with half-lives > 8 days.

** Note: Calculated from vendor analysis of monthly stack gas filters. Reported net beta and vendor analyzed Sr-89/90 were input to GASPARE code as Sr-90 to yield conservative dose estimates.

TABLE HP 10.5-3

PALISADES NUCLEAR PLANT SEMIANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

JANUARY 1989 to JUNE 1989

A. FISSION AND ACTIVATION PRODUCTS	UNITS	1st QUARTER	2nd QUARTER	Est Total Error %
1. Total release (not including tritium, gases, alpha)	Ci	1.14E-03	1.07E-03	
2. Average diluted concentration during period	uCi/ml	3.56E-11	3.26E-11	8.77
3. Percent of MPC	%	3.92E-03	1.90E-03	
B. TRITIUM				
1. Total release	Ci	1.77E+01	2.09E+01	
2. Average diluted concentration during period	uCi/ml	5.55E-07	6.40E-07	4.58
3. Percent of MPC	%	1.85E-02	2.13E-02	
C. DISSOLVED AND ENTRAINED GASES				
1. Total Release	Ci	None	None	
2. Average diluted concentration during period	uCi/ml	None	None	N/A
3. Percent of MPC	%	None	None	
D. GROSS ALPHA RADIOACTIVITY (Total Release) *				
	Ci	1.51E-06	8.22E-07	
1. Gross alpha average diluted concentration during period	uCi/ml	4.73E-14	2.51E-14	
E. VOLUME OF WASTE RELEASED (Prior to Dilution)				
	Liters	1.13E+06	7.66E+05	
F. VOLUME OF DILUTION WATER USED DURING PERIOD				
	Liters	3.19E+10	3.28E+10	
G. MAXIMUM DOSE COMMITMENT - WHOLEBODY				
	mRem	8.91E-04	7.00E-04	
Percent of TS 3.24.4.1a limit	%	5.94E-02	4.67E-02	
H. MAXIMUM DOSE COMMITMENT - ORGAN				
	mRem	1.75E-03	1.28E-03	
Percent of TS 3.24.4.1a limit	%	3.50E-02	2.56E-02	

Note: Calculated from vendor analysis of monthly radwaste composite samples.

TABLE HP 10.5-3

PALISADES NUCLEAR PLANT SEMIANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

LIQUID EFFLUENTS

JANUARY 1989 to JUNE 1989

1. NUCLIDES RELEASED	Units	1st QUARTER	2nd QUARTER
Cesium-137	Ci	3.41E-04	2.93E-04
Cobalt-58	Ci	7.41E-05	5.42E-05
Manganese-54	Ci	None	None
Cobalt-60	Ci	3.53E-04	4.87E-04
Cesium-134	Ci	None	None
Niobium-95	Ci	None	None
Rubidium-88	Ci	None	None
Chromium-51	Ci	None	None
Antimony-125	Ci	None	5.58E-05
Iodine-131	Ci	None	None
Strontium-89***	Ci	1.99E-06	1.07E-04
Strontium-90***	Ci	5.11E-06	5.40E-06
Net Unidentified Beta	Ci	3.60E-04	6.5E-05
Fission & Activation Product Total	Ci	1.14E-03	1.07E-03
Noble Gases	Ci	None	None
Tritium	Ci	1.77E+01	2.09E+01
Grand Total	Ci	1.77E+01	2.09E+01

*** NOTE: Calculated from vendor analysis of monthly radwaste composite samples.
Reported net beta and vendor analyzed Sr-89/90 were input to LADTAP code
as Sr-90 to yield conservative dose estimates.

TABLE HP 10.5-4

PALISADES NUCLEAR PLANT SEMIANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

SOLID RADIOACTIVE WASTE

JANUARY 1989 to JUNE 1989

<u>Waste Class</u>	<u>Source of Waste</u>	<u>Solidification Agent</u>	<u>Container Type</u>	<u>Volume (Cu.ft.)</u>	<u>*Total Curies</u>	<u>Principal Radionuclides*</u>
A	DAW	N/A	Metal Box	4114.8	10.7422	H ₃ , Mn-54, Fe-55, Co-57, Co-58, Co-60, Ni-63, Cs-134, Cs-137, Sr-90, Tc-99, C-14, I-129
A	Resin	N/A	Metal Box	120.4	0.7634	Mn-54, Co-58, Co-60, H ₃ , Cs-134, Cs-137, Tc-99
A	Concentrates	Asphalt	Metal Drums	752.1	9.606	H ₃ , Mn-54, Fe-55, Co-57, Co-58, Co-60, Ni-63, Cs-134, Cs-137, Sr-90, Tc-99, C-14, I-129, Sb-125
A	Filters	N/A	HIC Liner	84	11.3466	Co-58, Co-60, Cs-137, Mn-54, Ni-63, Sb-125
C	Irradiated Hardware	N/A	Steel liner	14.6	4111.8	Mn-54, Fe-55, Co-60, Ni-63
Total Shipped				5085.9	4144.2582	

* NOTE: Gamma isotopes are measured quantities; all other isotopes are estimated.

TABLE HP 10.5-2

PALISADES NUCLEAR PLANT SEMIANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

GASEOUS EFFLUENTS - SUMMATION OF RELEASES ***

JULY 1988 to DECEMBER 1988

A. FISSION AND ACTIVATION GASES	UNITS	3rd QUARTER	4th QUARTER	Est Total Error %
1. Total release	Ci	7.27E+02	1.68E+01	
2. Average release rate for period	uCi/sec	9.14E+01	2.11E+00	6.00
3. Percent of annual avg MPC	%	5.25E-02	2.13E-03	
<hr/>				
B. IODINES				
1. Total Iodine	Ci	1.87E-02	7.17E-04	
2. Average release rate for period *	uCi/sec	2.31E-03	4.30E-05	5.00
3. Percent of annual avg MPC *	%	3.02E-03	4.33E-05	
<hr/>				
C. PARTICULATES				
1. Particulates with half-life > 8 days	Ci	2.65E-04	6.54E-05	
2. Average release rate for period	uCi/sec	3.33E-05	8.22E-06	
3. Percent of annual avg limit MPC	%	7.24E-06	5.65E-06	24.6**
4. Gross alpha radioactivity	Ci	6.67E-06	2.82E-06	
5. Gross alpha average release rate for period	uCi/Sec	8.39E-07	3.55E-07	
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D. TRITIUM				
1. Total release	Ci	1.03E+00	1.32E+00	
2. Average release rate for period	uCi/sec	1.30E-01	1.66E-01	
3. Percent of annual avg MPC	%	9.29E-05	1.19E-04	
<hr/>				
E.				
1. Beta air dose at site boundary due to Noble Gases (TS 3.24.5.2a)	mRads	3.63E-02	1.16E-03	
2. Percent limit	%	3.63E-01	1.16E-02	
3. Gamma air dose at site boundary due to Noble Gases (TS 3.24.5.21)	mRads	1.61E-02	1.05E-03	
4. Percent limit	%	3.22E-01	2.10E-02	
<hr/>				
F.				
1. Maximum organ dose to public based based on critical receptors (TS 3.24.5.3)	mRem	7.60E-02	3.37E-03	
2. Percent of limit	%	1.01E+00	4.49E-02	

Note: Data is reported for I-131 and I-133 only.

Note: Large error factor due to small amount of particulates present in gaseous effluents.

*** Note: Fourth Quarter totals include release of WGD T-68A on 12/24/88.

PALISADES NUCLEAR POWER PLANT
OFFSITE DOSE CALCULATION MANUAL

REVISION 3

August 31, 1989

<p>Item to be Reviewed: <i>REMOVE THE STRUCTURAL MEMBER</i></p>	<p>Item Identification: No. <u>1185</u> Rev. <u>3</u></p>				
<p>1. Does the item involve a change to procedures as described in the FSAR? List FSAR Section(s) affected <u>11.0</u></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Yes	No	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Yes	No				
<input type="checkbox"/>	<input checked="" type="checkbox"/>				
<p>2. Does the item involve a change to the facility as described in the FSAR? List FSAR Section(s) affected <u>11.0</u></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Yes	No	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Yes	No				
<input type="checkbox"/>	<input checked="" type="checkbox"/>				
<p>3. Does the item involve a test or experiment not described in the FSAR? <u>11.0</u></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Yes	No	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Yes	No				
<input type="checkbox"/>	<input checked="" type="checkbox"/>				
<p>4. Does the item require a change to the Technical Specifications? List affected section(s) <u>delete of 2.57, 2.58, 3.1</u></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Yes	No	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Yes	No				
<input type="checkbox"/>	<input checked="" type="checkbox"/>				
<p>7 7 3 1</p> <p>page 1 <i>the technical change "deleted" & "inserted"</i> page 2 <i>technical specifications</i> page 7 <i>Table contains 2.57-3.1 term and change made to word</i> page 8 <i>deleted paragraph</i> page 9 <i>change of the way to open with safety valve</i> page 10 <i>same as 9</i> page 11 <i>delete the value for max. temp</i> page 12 <i>delete the value for max. temp (insert in original)</i> page 13 <i>same as 12</i> (over)</p>					
<p>If any Safety Review question listed above is answered Yes, perform a written Safety Evaluation according to Section 2.3.</p> <p>If all Safety Review questions listed above are answered No, a written Safety Evaluation is not required. However, this Attachment shall accompany other documentation for the item being evaluated in order to provide documentation that a Safety Evaluation was not required.</p>					
<p><i>[Signature]</i> Approved by: <u> </u></p>	<p><i>[Signature]</i> Approved by: <u> </u></p>				

page 48 c. 0 clarification
 page 57 new table 1.4 }
 page 58 new table 1.4c } revised for 1988 data
 page 57-58 table 1.7 from study 0120
 page 61 correct type
 page 62 correct type
 page 63-64 base on section on language samples
 page 66 clarification of units
 page 67 same - look
 page 68 run to error - clarification
 page 76-77 table 2.1 from study 0120
 page 80 table on dist 800 rate-area distribution
 caused by mixed individual rate levels as

These changes will make base calculations more accurate and
 reliable.

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