

3.0 GASEOUS EFFLUENTS

The gaseous radwaste effluents from WNP-2 were released in a continuous mode. There are three (3) release points at WNP-2:

1. Main Plant Vent - mixed mode release
2. Turbine Building - ground level release
3. Radwaste Building - ground level release

There were no batch or abnormal releases of gaseous effluent during the third and fourth quarters of 1984. Monitoring and sampling of the gaseous effluents were performed according to plant procedures. The setpoints for the environmental radiation monitors were set as described in the ODCM.

The gaseous source terms from each release points are listed in Table 3-1 to 3-3. Table 3-4 is a summation of the total releases of gaseous effluents from WNP-2 plus the average release rate, gross alpha activities and the estimated total error associated with the measurements of radioactivity in the gaseous effluents.

The method of calculating the total estimated error associated with the gaseous effluent measurements is similar to the one described in Section 2.0 (Liquid Effluents). The error estimates were performed on the gas grab sample, volume determination, flow rates, gas analysis by gamma spectrometry, air monitoring flow, calibration error of the gas analyzer detectors, and beta scintillation readings. The final error was calculated to be 36% at the 95% confidence level.

In Table 3-4, the "Percent of Technical Specification Limit" calculations were based on the offsite exposure. For the noble gases, dose to the whole body was 6.0 E-02 mrem for the third quarter and 1.8 E-02 mrem for the fourth quarter.

The maximum organ dose from the noble gases was 1.1 E-01 mrem for the third quarter and 3.6 E-02 mrem for the fourth quarter.

The maximum whole body dose due to Iodines and particulates was 6.3 E-02 mrem for the third quarter and 6.9 E-01 mrem for the fourth quarter.

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Table 3-1

WNP-2 GASEOUS EFFLUENTS
SOURCE TERMS - MIXED MODE RELEASES
MAIN PLANT VENT

July - December 1984

CONTINUOUS MODE

Nuclides Released	Unit	3rd Quarter	4th Quarter
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1. Fission gases

Krypton-85	Ci	0.0	0.0
Krypton-85m	Ci	9.1 E-02	7.8 E-01
Krypton-87	Ci	1.0 E+0	4.0 E+0
Krypton-88	Ci	1.1 E+0	2.8 E+00
Xenon-133	Ci	1.4 E-01	3.3 E+0
Xenon-133m	Ci	1.2 E+00	7.9 E+00
Xenon-135	Ci	5.8 E-01	2.1 E+01
Xenon-135m	Ci	1.2 E+0	1.6 E+0.
Xenon-138	Ci	9.5 E+0	3.5 E+01
Xenon-131m	Ci	0.0	0.0
Argon-41	Ci	4.3 E-03	3.3 E+0
Total for period	Ci	1.5 E+01	8.0 E+01

2. Iodines

Iodine-131	Ci	7.2 E-04	1.5 E-03
Iodine-133	Ci	4.2 E-02	1.1 E-02
Total for period	Ci	4.3 E-02	1.3 E-02

Table 3-1 (Continued)

3. Particulates

Strontium-89	Ci	1.9 E-05	2.6 E-06
Strontium-90	Ci	1.0 E-05	1.1 E-05
Cesium-134	Ci	1.0 E-04	3.3 E-04
Cesium-137	Ci	1.2 E-04	3.0 E-04
Barium-lanthanum-140	Ci	4.0 E-04	1.2 E-03
Molybdenum-99	Ci	5.9 E-04	5.1 E-04
Cerium-141	Ci	1.5 E-04	3.6 E-04
Cerium-144	Ci	5.1 E-04	1.0 E-03
Cobalt-58	Ci	1.3 E-04	1.8 E-03
Cobalt-60	Ci	1.3 E-04	3.9 E-04
Chromium-51	Ci	1.0 E-03	3.4 E-03
Zinc-65	Ci	4.5 E-04	1.6 E-03
Zirconium-95	Ci	1.9 E-04	4.0 E-04
Iron-59	Ci	2.0 E-04	9.9 E-04
Manganese-54	Ci	2.3 E-04	9.2 E-04
Total for period	Ci	4.2 E-03	1.3 E-02

4. Tritium	Ci	1.0 E-04	4.7 E-04
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Total building release	Ci	1.5 E+01	8.0 E+01
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Table 3-2

WNP-2 GASEOUS EFFLUENTS
SOURCE TERMS GROUND LEVEL RELEASES
TURBINE BUILDING

July - December 1984

CONTINUOUS MODE

Nuclides Released	Unit	3rd Quarter	4th Quarter
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1. Fission gases

Krypton-85	Ci	0.0	0.0
Krypton-85m	Ci	0.0	0.0
Krypton-87	Ci	8.5 E-01	2.3 E+0
Krypton-88	Ci	1.1 E+0	2.9 E+0
Xenon-133	Ci	1.1 E+0	2.7 E+0
Xenon-135	Ci	3.0 E-01	7.9 E-01
Xenon-138	Ci	1.4 E+01	3.5 E+01
Xenon-133m	Ci	2.6 E+0	6.3 E+0
Total for period	Ci	2.0 E+01	5.0 E+01

2. Iodines

Iodine-131	Ci	1.4 E-03	4.7 E-04
Iodine-133	Ci	1.7 E-02	7.5 E-03
Total for period	Ci	1.8 E-02	8.0 E-03

Table 3-2 (Continued)

3. Particulates

Strontium-89	Ci	6.0 E-05	1.7 E-05
Strontium-90	Ci	8.4 E-05	2.7 E-05
Cesium-134	Ci	3.6 E-04	3.7 E-04
Cesium-137	Ci	4.1 E-04	4.1 E-04
Barium-lanthanum-140	Ci	1.5 E-03	1.6 E-03
Cerium-141	Ci	4.3 E-04	4.5 E-04
Cerium-144	Ci	1.8 E-03	1.6 E-03
Cobalt-58	Ci	3.8 E-04	3.6 E-04
Molybdenum-99	Ci	5.7 E-04	8.7 E-04
Cobalt-60	Ci	5.1 E-04	5.0 E-04
Chromium-51	Ci	3.0 E-03	3.4 E-03
Zinc-65	Ci	6.8 E-04	1.5 E-03
Zirconium-95	Ci	5.8 E-04	9.9 E-04
Iron-59	Ci	7.4 E-04	1.2 E-03
Manganese-54	Ci	3.5 E-04	3.2 E-04
Total for period	Ci	1.1 E-02	1.4 E-02

4. Tritium	Ci	5.8 E-03	2.6 E-03
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Total building release	Ci	2.0 E+01	5.0 E+01
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Table 3-3

WNP-2 GASEOUS EFFLUENTS
SOURCE TERMS GROUND LEVEL RELEASES
RADWASTE BUILDING

July - December 1984

CONTINUOUS MODE

Nuclides Released	Unit	3rd Quarter	4th Quarter
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1. Fission gases

Krypton-87	Ci	2.6 E-01	1.3 E+00
Krypton-88	Ci	2.8 E-01	1.3 E+00
Xenon-133	Ci	7.6 E-01	1.7 E+00
Xenon-135	Ci	2.4 E-01	2.9 E+00
Xenon-138	Ci	5.3 E+0	1.2 E+01
Xenon-133m	Ci	6.8 E-01	3.5 E+00
Total for period	Ci	7.5 E+0	2.3 E+01

2. Iodines

Iodine-131	Ci	2.9 E-04	7.9 E-04
Iodine-133	Ci	6.1 E-03	5.2 E-03
Total for period	Ci	6.4 E-03	6.0 E-03

Table 3-3 (Continued)

3. Particulates

Strontium-89	Ci	1.0 E-05	1.8 E-06
Strontium-90	Ci	8.1 E-06	2.9 E-06
Cesium-134	Ci	5.8 E-05	3.2 E-04
Cesium-137	Ci	6.0 E-05	9.5 E-04
Barium-Lanthanum-140	Ci	2.1 E-04	8.3 E-04
Molybdenum-99	Ci	1.4 E-04	3.2 E-04
Cerium-141	Ci	7.2 E-05	3.1 E-04
Cerium-144	Ci	2.8 E-04	1.1 E-03
Cobalt-58	Ci	5.3 E-05	3.0 E-04
Cobalt-60	Ci	8.0 E-05	1.7 E-04
Chromium-51	Ci	4.4 E-04	2.4 E-03
Zinc-65	Ci	1.4 E-04	6.9 E-04
Zirconium-95	Ci	1.1 E-04	4.2 E-04
Iron-59	Ci	1.2 E-04	4.7 E-04
Manganese-54	Ci	6.7 E-05	3.4 E-04
Total for period	Ci	1.9 E-03	8.6 E-03

4. Tritium	Ci	1.0 E-02	1.6 E-03
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Total building release	Ci	7.5 E+0	2.3 E+01
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Table 3-4

WNP-2 GASEOUS EFFLUENTS
SUMMATION OF ALL RELEASES

July - December 1984

Unit	3rd Quarter	4th Quarter	Est. Total Error %*
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A. Fission & activation gases

1. Total release	Ci	4.3 E+01	1.5 E+02	3.6 E+1
2. Average release rate for period	uCi/sec	5.4 E+00	1.9 E+01	
3. Percent of Tech. Spec. limit	%	1.2 E-02	3.6 E-03	

B. Iodines

1. Total iodine (131, 133)	Ci	6.7 E-02	2.7 E-02	3.6 E+1
2. Average release rate for period	uCi/sec	8.5 E-03	3.4 E-03	
3. Percent of Tech. Spec. limit	%	3.2 E-03	1.0 E-03	

C. Particulates

1. Particulates with half-lives 8 days	Ci	1.7 E-02	3.6 E-02	3.6 E+1
2. Average release rate for period	uCi/sec	2.2 E-03	4.6 E-03	
3. Percent of Tech. Spec. limit	%	1.9 E-03	4.5 E-02	
4. Gross alpha radioactivity	Ci	6.6 E-10	1.1 E-09	

D. Tritium

1. Total releases	Ci	1.7 E-02	4.7 E-03	3.6 E+1
2. Average release rate for period	uCi/sec	2.2 E-03	5.9 E-04	
3. Percent of Tech. Spec. limit**	%	4.9 E-07	7.3 E-08	

* At 95% confidence level

** Based on offsite exposure to the maximum organ. age group, the child.

Table.6-4

SEMI-ANNUAL SUMMARY OF DOSES FROM WNP-2 GASEOUS EFFLUENTS

Location: 1.2 miles site boundary
Reporting Period: Third and Fourth Quarter, 1984
Age Group: Child

	<u>Third Quarter</u>	<u>Fourth Quarter</u>	<u>1984 Total Cumulative</u>	<u>Balance to Year-End</u>
Beta air dose (mrad)	5.0E-02	1.9E-02	1.2E-01	1.98E+01
Gamma air dose (mrad)	9.0E-02	2.7E-02	2.3E-01	9.77E+00
Whole body dose from Noble gases (mrem)*	6.0E-02	1.8E-02	1.1E-01	4.99E+02
Maximum organ dose from Noble gases (mrem)*	1.1E-01	3.6E-02	2.7E-01	2.99E+03
Whole body dose from Iodines and particulates (mrem)**	1.3E-02	4.8E-01	6.4E-01	1.49E+03
Maximum organ dose from Iodines and particulates (mrem)**	6.3E-02	6.9E-01	9.9E-01	1.49E+03

Location: Taylor Flats, 4.2 miles SE
Reporting Period: Third and Fourth Quarters, 1984
Age Group: Infant

	<u>Third Quarter</u>	<u>Fourth Quarter</u>	<u>1984 Total Cumulative</u>	<u>Balance to Year-End</u>
Whole body dose (mrem)***	5.2E-04	2.5E-02	5.7E-02	1.49E+01
Maximum organ dose (mrem)***	1.6E-02	6.5E-02	2.0E-01	1.48E+01
50 mile population whole body dose (man-rem)	4.9E-03	3.3E-01		
50 mile maximum organ dose (man-rem)	4.1E-02	5.5E-01		

* Plume submersion exposure pathway.

** Inhalation and ground contamination exposure pathways.

*** Ground, goat milk, and inhalation exposure pathways.