ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9208240334 DOC. DATE: ~~92/06/30~~ NOTARIZED: NO DOCKET #
FACIL: 50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
AUTH. NAME AUTHOR AFFILIATION
BAKER, J. W. Washington Public Power Supply System
RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: "WNP-2 Semiannual Radioactive Effluent Release Rept Jan through June 1992." W/920818 ltr.

DISTRIBUTION CODE: IE48D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 37
TITLE: 50.36a(a)(2) Semiannual Effluent Release Reports

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD5 LA	3	3	PD5 PD	1	1
	DEAN, W.	1	1			
INTERNAL:	~~ACRS~~	1	1	NRR/DREP/PRPB11	2	2
	REG FILE 01	1	1	RGN5 DRSS/RPB	2	2
	~~RGN5 FILE 02~~	1	1			
EXTERNAL:	BNL TICHLER, J03	1	1	EG&G SIMPSON, F	2	2
	NRC PDR	1	1			

R I D S / A D D S

R I D S / A D D S

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK. ROOM P1-37 (EXT. 504-2065) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 16 ENCL 16

Er-1

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O. Box 968 • 3000 George Washington Way • Richland, Washington 99352-0968 • (509) 372-5000

August 18, 1992
G02-92-199

Docket No. 50-397

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

Gentlemen:

Subject: WNP-2, OPERATING LICENSE NPF-21
SEMI-ANNUAL EFFLUENT REPORT
JANUARY 1, 1992 - JUNE 30, 1992

In accordance with Title 10 of the Code of Federal Regulations, Part 50.36a(a)(2), and section 6.9.1.11 of the WNP-2 Technical Specifications the subject report is herewith being submitted.

Should you have any questions, please contact Mr. D. J. Pisarcik, Manager, WNP-2 Health Physics.

Sincerely,

RT Havlovick for

J. W. Baker
WNP-2 Plant Manager (Mail Drop 927M)

RFH/bk
Attachment

cc: JB Martin - NRC RV
NS Reynolds - Winston & Strawn
RR Assa - NRC
DL Williams - BPA/399
NRC Site Inspector - 901A
D Sherman - American Nuclear Insurers
TS Strong - WDOH
RG Waldo - EFSEC

IE48

REFERENCE:
10CFR50.36a(a)(2)

WNP-2 SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JANUARY THROUGH JUNE 1992

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

LICENSE NO. NPF-21

TABLE OF CONTENTS

LIST OF TABLES

TABLE

1.0 INTRODUCTION

This report is submitted in compliance with 10CFR50.36a(a)(2) and Technical Specification 6.9.1.11. It includes a summary of the quantities of radioactive liquid and gaseous effluents and solid radwaste released from WNP-2 during the previous six months of operation. Effluent data is summarized on a quarterly basis.

2.0 LIQUID EFFLUENTS

The radwaste liquid effluents were released in "batch mode" during the reporting period. Sixteen (16) liquid batch releases occurred during the first calendar quarter and 53 batch releases were performed during the second calendar quarter. The total time period for the batch releases was 134.1 hours, with the maximum, minimum and average time periods for a release being 2.8, 1.3, and 1.9 hours, respectively. The volume of dilution water considered is assumed to be the total volume of recirculating cooling tower blowdown flow for the period. The average flow rate of the Columbia River during January through June 1992 was 1.1E+05 cubic feet per second.

Computer runs were performed to verify compliance with Offsite Dose Calculation Manual (ODCM) limits. The first quarter calculated dose for the maximum individual (adult age group) was 6.4E-03 mrem whole body and 9.1E-03 mrem for the maximum organ. The second quarter calculated dose for the maximum individual (adult age group) was 2.5E-02 mrem whole body and 2.8E-02 mrem for the maximum organ.

The liquid batch releases were recirculated prior to sampling. A representative sample was obtained and analyzed for each batch release. A composite of the batch samples for each quarter was analyzed for strontium and iron. The methods used for measuring the total radioactivity were gamma spectroscopy, liquid scintillation and proportional counting. Table 2-1 provides a summation of all liquid releases during this reporting period.

The percent of MPC limit in Table 2-1 is based on the total of the MPC fractions using the nuclides in Table 2-2 and the concentrations listed in 10CFR20, Appendix B, Table 2, Column 2.

Estimated total errors are listed in Table 2-1, and are propagated from individual error estimates of sample activity, sample volume, tank volume, and tank homogeneity. The estimated total errors were calculated by obtaining the square root of the sum of the squares of the individual error contributions and multiplying by 1.96 for a 95% confidence level.

There were two abnormal occurrences which were documented in the form of Problem Evaluation Requests (PER) for inclusion into this Semiannual Radioactive Effluent Release Report.

PER, 292-0622, was issued for a liquid batch release sample, 1 of 24, which was found to be missing for inclusion into the monthly batch release composite.

PER, 292-0671, was issued for a floor drain tank which was partially released to the effluent blowdown line prior to the completion of release sampling. Refer to Table 2-2A for data content from this abnormal release. There was no significant dose consequence to station personnel or the general public.

TABLE 2-1

WNP-2 LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES
REPORT PERIOD: JANUARY - JUNE 1992

	UNIT	1ST QUARTER	2ND QUARTER	*EST. TOTAL ERROR
A. FISSION AND ACTIVATION PRODUCTS				
TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES AND ALPHA)	Ci	4.7E-03	6.5E-02	22%
AVG. DILUTED CONC. DURING PERIOD	uCi/ml	4.9E-09	8.5E-08	
PERCENT OF MPC LIMIT	%	4.0E-02	2.4E-01	
B. TRITIUM				
TOTAL RELEASE	Ci	4.5E-01	2.6E+00	22%
AVG. DILUTED CONC. DURING PERIOD	uCi/ml	4.7E-07	3.4E-06	
PERCENT OF MPC LIMIT	%	1.6E-02	1.1E-01	
C. DISSOLVED AND ENTRAINED GASES				
TOTAL RELEASE	Ci	<5.0E-04	<1.1E-04	22%
AVG. DILUTED CONC. DURING PERIOD	uCi/ml	<5.2E-10	<1.5E-10	
PERCENT OF MPC LIMIT	%	<2.6E-04	<7.5E-05	
D. GROSS ALPHA RADIOACTIVITY				
TOTAL RELEASE	Ci	1.5E-10	7.5E-11	23%
E. UNDILUTED EFFLUENT VOLUME				
VOLUME OF WATER (PRIOR TO DILUTION)	LITERS	9.2E+05	3.0E+06	15%
F. DILUTION VOLUME				
VOLUME OF DILUTION WATER USED DURING PERIOD	LITERS	9.6E+08	7.6E+08	15%

* At 95% Confidence Level

TABLE 2-2

WNP-2 LIQUID EFFLUENTS - SOURCE TERMS
REPORT PERIOD: JANUARY - JUNE 1992

BATCH MODE

NUCLIDES RELEASED	UNIT	1st QUARTER	2nd QUARTER
STRONTIUM-89	Ci	6.1E-06	9.3E-05
STRONTIUM-90	Ci	3.3E-06	1.7E-05
CESIUM-134	Ci	5.1E-04	1.4E-03
CESIUM-137	Ci	9.8E-04	3.7E-03
IODINE-131	Ci	5.9E-05	9.1E-05
COBALT-58	Ci	8.1E-05	1.8E-03
COBALT-60	Ci	1.5E-03	2.7E-02
IRON-59	Ci	<4.5E-05	3.3E-04
ZINC-65	Ci	7.7E-04	1.3E-02
MANGANESE-54	Ci	1.1E-04	1.5E-03
CHROMIUM-51	Ci	3.8E-04	1.3E-02
ZIRCONIUM/NIOBIUM-95	Ci	<4.9E-05	3.1E-04
MOLYBDENUM-99	Ci	3.6E-05	<7.5E-04
TECHNETIUM-99m	Ci	<3.5E-04	<5.3E-04
BARIUM/LANTHANUM-140	Ci	<9.1E-05	<1.8E-04
CERIUM-141	Ci	<4.1E-05	<7.0E-05
CERIUM-144	Ci	<1.5E-04	<2.6E-04
IRON-55	Ci	4.3E-05	2.5E-03

TABLE 2-2 (Continued)

BATCH MODE

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
OTHERS			
SODIUM-24	Ci	2.5E-04	<3.3E-05
SILVER-110m	Ci	<7.7E-05	2.6E-04
TOTAL FOR PERIOD ABOVE:	Ci	4.7E-03	6.5E-02
XENON-133	Ci	<1.4E-04	<7.1E-05
XENON-135	Ci	<3.6E-04	<4.2E-05
TRITIUM (HYDROGEN-3)	Ci	4.5E-01	2.6E+00

Note: Less than (<) values are not included in the Total For Period values.

TABLE 2-2A

LIQUID EFFLUENT RELEASE FOR PER 292-0671

NUCLIDES RELEASED		JUNE 92
STRONTIUM-89	Ci	1.9E-06
STRONTIUM-90	Ci	3.5E-07
COBALT-58	Ci	2.1E-05
COBALT-60	Ci	6.7E-04
ZINC-65	Ci	1.9E-04
MANGANESE-54	Ci	3.9E-05
IRON-55	Ci	5.1E-05
TRITIUM (HYDROGEN-3)	Ci	4.3E-01
TOTAL	Ci	4.3E-01

TOTAL DISCHARGED	(Liters)	= 6.0E+04
COOLING TOWER BLOWDOWN FLOWRATE	(Liters/min)	= 5.9E+03
DISCHARGED TIME	(Hours)	= 2.1
TOTAL FISSION AND ACTIVATION PRODUCTS:		
Total Release	(Ci)	= 9.4E-04
Diluted Concentration	(uCi/ml)	= 1.3E-06
Percent of MPC Limit		= 3.5E+00
TRITIUM:		
Total Release	(Ci)	= 4.3E-01
Diluted Concentration	(uCi/ml)	= 5.8E-04
Percent of MPC Limit		= 1.9E+01

CALCULATED DOSE (Adult Age Group)

Whole Body	(mrem)	= 6.8E-05
Organ	(mrem)	= 1.3E-04

3.0 GASEOUS EFFLUENTS

The gaseous radwaste effluents from WNP-2 were released from three (3) release points:

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

The gaseous source terms from each release point are listed in Tables 3-1, 3-2, and 3-3. Table 3-4 provides a summation of the total activity released, the average release rate, the percent of ODCM Specification limit, gross alpha radioactivity and the estimated total error associated with the measurements of radioactivity in the gaseous effluents.

Radioactivity measurements for gaseous effluent releases are performed for fission and activation gases by collecting the samples on charcoal traps and analyzing them using gamma spectroscopy. Tritium is sampled by freeze trapping and analyzed by liquid scintillation counting. Particulates and iodines are sampled using particulate filters and charcoal cartridges. Both are analyzed using gamma spectroscopy.

Total error estimates are propagated from individual error estimates of sample volume, sample activity and effluent flow rate measurements. The overriding uncertainty in all cases is in the measurement of the effluent and sample volumes. The estimated error was determined to be 36% at the 95% confidence level.

The percent of ODCM limit for fission and activation gases (air dose) was determined for locations 1 through 8 and was based on quarterly limits of ten (10) millirads for beta and five (5) millirads for gamma. Locations 1 through 8 were used to determine the most restrictive value to be used in Table 3-4, Section A.3.

The percent of ODCM limit calculations for iodines, particulates with half-lives greater than eight (8) days and tritium are based on the quarterly limit of 7.5 mrem to any organ. Locations 4 through 8 were used to determine the most restrictive value to be used in Table 3-4 for each quarter.

Calculations were performed for releases using the NRC GASPAR II computer program and parameters as outlined in the ODCM. Quarterly doses were determined at the following locations:

Location 1: Site Boundary; 1.2 miles (ground and inhalation pathways)

QUANTITY	UNIT	1ST QUARTER	2ND QUARTER
BETA AIR DOSE	mrad	5.7E-02	8.5E-04
PERCENT OF ODCM LIMIT	%	5.7E-01	8.5E-03
GAMMA AIR DOSE	mrad	3.9E-02	6.4E-04
PERCENT OF ODCM LIMIT	%	7.8E-01	1.3E-02
HIGHEST ORGAN DOSE	mrem	5.8E-02	1.6E-02
PERCENT OF ODCM LIMIT	%	7.7E-01	2.1E-01

Location 2: Beyond Site Boundary; 3.9 and 3.3 miles ESE, respectively (ground and inhalation pathways) at the location having the highest X/Q values for mixed mode releases.

QUANTITY	UNIT	1ST QUARTER	2ND QUARTER
BETA AIR DOSE	mrad	7.9E-03	7.5E-05
PERCENT OF ODCM LIMIT	%	7.9E-02	7.5E-04
GAMMA AIR DOSE	mrad	5.4E-03	7.3E-05
PERCENT OF ODCM LIMIT	%	1.1E-01	1.5E-03
HIGHEST ORGAN DOSE	mrem	9.0E-03	2.5E-03
PERCENT OF ODCM LIMIT	%	1.2E-01	3.3E-02

Location 3: Beyond Site Boundary; 3 miles ESE for the first and second quarters, respectively (ground and inhalation pathways) at the location having the highest X/Q values for ground level release mode.

QUANTITY	UNIT	1ST QUARTER	2ND QUARTER
BETA AIR DOSE	mrad	1.3E-02	7.7E-05
PERCENT OF ODCM LIMIT	%	1.3E-01	7.7E-04
GAMMA AIR DOSE	mrad	9.9E-03	7.1E-05
PERCENT OF ODCM LIMIT	%	2.0E-01	1.4E-03
HIGHEST ORGAN DOSE	mrem	1.1E-02	2.8E-03
PERCENT OF ODCM LIMIT	%	1.5E-01	3.7E-02

Location 4: 4.5 miles ESE (ground, vegetables and inhalation pathways)

QUANTITY	UNIT	1ST QUARTER	2ND QUARTER
BETA AIR DOSE	mrad	5.9E-03	3.9E-05
PERCENT OF ODCM LIMIT	%	5.9E-02	3.9E-04
GAMMA AIR DOSE	mrad	4.0E-03	3.3E-05
PERCENT OF ODCM LIMIT	%	8.0E-02	6.6E-04
HIGHEST ORGAN DOSE	mrem	1.4E-02	5.0E-03
PERCENT OF ODCM LIMIT	%	1.9E-01	6.7E-02

Location 5: 6.4 miles SE (ground, meat, cow milk and inhalation pathways)

QUANTITY	UNIT	1ST QUARTER	2ND QUARTER
BETA AIR DOSE	mrad	2.6E-03	4.4E-05
PERCENT OF ODCM LIMIT	%	2.6E-02	4.4E-04
GAMMA AIR DOSE	mrad	1.8E-03	3.8E-05
PERCENT OF ODCM LIMIT	%	3.6E-02	7.6E-04
HIGHEST ORGAN DOSE	mrem	6.0E-03	9.1E-03
PERCENT OF ODCM LIMIT	%	8.0E-02	1.2E-01

Location 6: 4.1 miles ESE (ground, vegetables and inhalation pathways)

QUANTITY	UNIT	1ST QUARTER	2ND QUARTER
BETA AIR DOSE	mrad	8.2E-03	5.2E-05
PERCENT OF ODCM LIMIT	%	8.2E-02	5.2E-04
GAMMA AIR DOSE	mrad	5.7E-03	5.2E-05
PERCENT OF ODCM LIMIT	%	1.1E-01	1.0E-03
HIGHEST ORGAN DOSE	mrem	1.8E-02	6.0E-03
PERCENT OF ODCM LIMIT	%	2.4E-01	8.0E-02

Location 7: 4.3 miles NE (ground and inhalation pathways)

QUANTITY	UNIT	1ST QUARTER	2ND QUARTER
BETA AIR DOSE	mrad	1.6E-03	3.5E-05
PERCENT OF ODCM LIMIT	%	1.6E-02	3.5E-04
GAMMA AIR DOSE	mrad	1.1E-03	2.8E-05
PERCENT OF ODCM LIMIT	%	2.2E-02	5.6E-04
HIGHEST ORGAN DOSE	mrem	1.8E-03	8.0E-04
PERCENT OF ODCM LIMIT	%	2.4E-02	1.1E-02

Location 8: 4.1 miles ENE; (ground, vegetables and inhalation pathways)

QUANTITY	UNIT	1ST QUARTER	2ND QUARTER
BETA AIR DOSE	mrad	3.1E-03	3.6E-05
PERCENT OF ODCM LIMIT	%	3.1E-02	3.6E-04
GAMMA AIR DOSE	mrad	2.0E-03	3.3E-05
PERCENT OF ODCM LIMIT	%	4.0E-02	6.6E-04
HIGHEST ORGAN DOSE	mrem	6.9E-03	3.2E-03
PERCENT OF ODCM LIMIT	%	9.2E-02	4.3E-02

In addition to the reactor facility, WNP-2 has a permanent laundry facility located approximately 0.75 miles from the reactor building. Its ventilation system contains HEPA filters on the discharge and is continuously monitored for particulates. Also, the backup chemistry laboratory within the Emergency Operations Facility (EOF) is located adjacent to the laundry facility. The radiochemical hood within the backup chemistry lab contains HEPA filters and is monitored for radioactive releases when in operation. Gamma spectrometry indicated no radioactive material present other than that attributable to natural background.

There were no abnormal releases of gaseous effluent during the first and second quarters of 1992.

TABLE 3-1

WNP-2 GASEOUS EFFLUENTS - SOURCE TERMS
MIXED MODE RELEASES - MAIN PLANT VENT
REPORT PERIOD: JANUARY - JUNE 1992

CONTINUOUS MODE

1. FISSION/ACTIVATION GASES

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
KRYPTON-85	Ci	<1.3E-01	<1.7E-01
KRYPTON-85m	Ci	<2.8E+01	<8.7E+00
KRYPTON-87	Ci	<5.3E-01	<4.4E-01
KRYPTON-88	Ci	<8.6E-01	<5.2E-01
XENON-133	Ci	1.8E+00	1.3E-01
XENON-133m	Ci	<2.1E+00	<1.1E+00
XENON-135	Ci	7.3E+00	1.5E-01
XENON-135m	Ci	3.6E+00	4.7E-01
XENON-138	Ci	3.0E+00	1.3E+00
OTHERS			
XENON-137	Ci	7.2E-01	<6.4E+00
ARGON-41	Ci	8.2E-02	9.0E-02
TOTAL FOR PERIOD ABOVE:	Ci	1.7E+01	2.1E+00

2. IODINES

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
IODINE-131	Ci	8.3E-04	9.0E-04
IODINE-132	Ci	2.6E-04	<2.2E-04
IODINE-133	Ci	2.3E-03	2.2E-03
IODINE-134	Ci	<1.4E-03	<1.4E-03
IODINE-135	Ci	<7.0E-04	<7.0E-04
TOTAL FOR PERIOD ABOVE:	Ci	3.4E-03	3.1E-03

TABLE 3-1 (Continued)

3. PARTICULATES

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
STRONTIUM-89	Ci	2.1E-05	1.2E-04
STRONTIUM-90	Ci	2.4E-06	8.1E-06
CESIUM-134	Ci	7.0E-05	8.9E-05
CESIUM-137	Ci	<1.3E-04	1.6E-04
BARIUM/LANTHANUM-140	Ci	1.0E-02	1.4E-04
MOLYBDENUM-99	Ci	<7.3E-04	<9.3E-04
CERIUM-141	Ci	<7.6E-05	<1.4E-04
CERIUM-144	Ci	<2.1E-04	<5.2E-04
COBALT-58	Ci	<1.0E-04	<1.0E-04
COBALT-60	Ci	<2.4E-04	1.6E-03
IRON-59	Ci	<3.8E-04	<3.5E-04
MANGANESE-54	Ci	<1.3E-04	<1.3E-04
ZINC-65	Ci	<2.6E-04	1.5E-04
TOTAL FOR PERIOD ABOVE:	Ci	1.0E-02	2.3E-03

OTHER PARTICULATES WITH T 1/2 < 8 DAYS

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
STRONTIUM-91	Ci	4.8E-05	1.1E-05
CESIUM-138	Ci	1.1E-02	2.6E-03
BARIUM-139	Ci	3.6E-02	4.9E-03
TOTAL (T 1/2 <8 DAYS):	Ci	4.7E-02	7.5E-03

4. TRITIUM

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
TRITIUM (HYDROGEN-3)	Ci	8.0E-01	1.5E+00

TOTAL BUILDING RELEASE:	Ci	1.7E+01	3.6E+00

Note: Less than (<) values and particulates with T 1/2 < 8 days are not included in Total Building Release values.

TABLE 3-2

WNP-2 GASEOUS EFFLUENTS - SOURCE TERMS
GROUND LEVEL RELEASES - TURBINE GENERATOR BUILDING
REPORT PERIOD: JANUARY - JUNE 1992

CONTINUOUS MODE

1. FISSION/ACTIVATION GASES

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
KRYPTON-85	Ci	<3.8E-01	<5.1E-01
KRYPTON-85m	Ci	<8.5E+01	<9.2E+01
KRYPTON-87	Ci	<8.3E-01	<7.7E-01
KRYPTON-88	Ci	<9.2E-01	<7.7E-01
XENON-133	Ci	1.2E+01	<5.1E-01
XENON-133m	Ci	<3.8E+00	<3.1E+00
XENON-135	Ci	2.7E+01	2.1E-01
XENON-135m	Ci	3.8E+00	2.8E-01
XENON-138	Ci	3.1E+00	6.8E-01
OTHERS			
NONE			
TOTAL FOR PERIOD ABOVE:	Ci	4.6E+01	1.2E+00

2. IODINES

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
IODINE-131	Ci	1.4E-03	1.1E-03
IODINE-132	Ci	6.9E-03	<2.4E-04
IODINE-133	Ci	1.2E-02	1.9E-03
IODINE-134	Ci	7.5E-04	<6.7E-04
IODINE-135	Ci	2.0E-02	2.3E-02
TOTAL FOR PERIOD ABOVE:	Ci	4.1E-02	2.6E-02

TABLE 3-2 (continued)

3. PARTICULATES

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
STRONTIUM-89	Ci	6.0E-04	1.1E-03
STRONTIUM-90	Ci	<3.5E-06	<2.7E-06
CESIUM-134	Ci	<2.4E-04	<1.8E-04
CESIUM-137	Ci	<3.2E-04	<2.5E-04
BARIUM/LANTHANUM-140	Ci	1.2E-02	1.1E-03
MOLYBDENUM-99	Ci	<2.3E-03	<1.8E-03
CERIUM-141	Ci	<2.7E-04	<2.1E-04
CERIUM-144	Ci	<6.6E-04	<5.1E-04
COBALT-58	Ci	<2.9E-04	<2.2E-04
COBALT-60	Ci	<3.5E-04	<2.7E-04
IRON-59	Ci	<6.8E-04	<5.2E-04
MANGANESE-54	Ci	<2.4E-04	<1.8E-04
ZINC-65	Ci	<5.2E-04	<4.0E-04
TOTAL FOR PERIOD ABOVE:	Ci	1.3E-02	2.2E-03

OTHER PARTICULATES WITH T 1/2 < 8 DAYS

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
RUBIDIUM-89	Ci	9.4E-04	2.5E-04
STRONTIUM-91	Ci	1.4E-03	1.5E-04
STRONTIUM-92	Ci	1.4E-02	<2.8E-04
CESIUM-138	Ci	1.8E+00	2.2E-01
BARIUM-139	Ci	7.5E-01	1.9E-01
TOTAL (T 1/2 <8 DAYS):	Ci	2.6E+00	4.1E-01

TABLE 3-2 (continued)

4. TRITIUM

NUCLIDES RELEASED	UNITS	1ST QUARTER	2ND QUARTER
TRITIUM (HYDROGEN-3)	Ci	5.6E+00	5.4E-01

TOTAL BUILDING RELEASE	Ci	5.2E+01	1.7E+00

Note: Less than (<) values and particulates with T 1/2 < 8 days are not included in the Total Building Release values.

TABLE 3-3

WNP-2 GASEOUS EFFLUENTS - SOURCE TERMS
GROUND LEVEL RELEASES - RADWASTE BUILDING
REPORT PERIOD: JANUARY - JUNE 1992

CONTINUOUS MODE

1. FISSION/ACTIVATION GASES

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
KRYPTON-85	Ci	<3.2E+01	<3.9E+01
KRYPTON-85m	Ci	<1.1E-01	<1.4E-01
KRYPTON-87	Ci	<1.3E+00	<4.2E-01
KRYPTON-88	Ci	<3.2E+00	<5.3E-01
XENON-133	Ci	3.6E+00	1.1E+00
XENON-133m	Ci	<6.3E+00	<7.3E-01
XENON-135	Ci	3.8E+00	8.2E-01
XENON-135m	Ci	8.3E+00	1.2E+00
XENON-138	Ci	1.9E-01	1.8E-01
OTHERS			
NONE			
TOTAL FOR PERIOD ABOVE:	Ci	1.6E+01	3.3E+00

2. IODINES

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
IODINE-131	Ci	1.2E-04	5.4E-05
IODINE-132	Ci	7.9E-05	2.4E-05
IODINE-133	Ci	3.1E-04	8.0E-05
IODINE-134	Ci	3.3E-05	<3.9E-04
IODINE-135	Ci	2.5E-05	3.1E-05
TOTAL FOR PERIOD ABOVE:	Ci	5.7E-04	1.9E-04

TABLE 3-3 (Continued)

3. PARTICULATES

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
STRONTIUM-89	Ci	2.8E-05	2.4E-05
STRONTIUM-90	Ci	<4.7E-06	<3.7E-06
CESIUM-134	Ci	<4.9E-05	<3.1E-05
CESIUM-137	Ci	<5.5E-05	<3.2E-05
BARIUM/LANTHANUM-140	Ci	<1.3E-04	<9.0E-05
MOLYBDENUM-99	Ci	<5.2E-04	<3.6E-04
CERIUM-141	Ci	<4.5E-05	<2.7E-05
CERIUM-144	Ci	<1.7E-04	<9.0E-05
COBALT-58	Ci	<4.2E-05	<2.6E-05
COBALT-60	Ci	<7.7E-05	<5.1E-05
IRON-59	Ci	<1.5E-04	<8.2E-05
MANGANESE-54	Ci	<4.3E-05	<2.5E-05
ZINC-65	Ci	<1.0E-04	<6.4E-05
TOTAL FOR PERIOD ABOVE:	Ci	2.8E-05	2.4E-05

OTHER PARTICULATES WITH T 1/2 < 8 DAYS

NUCLIDES RELEASED	UNIT	1ST QUARTER	2ND QUARTER
NONE	Ci		
TOTAL (T 1/2 <8 DAYS):	Ci	NA	NA

4. TRITIUM

NUCLIDES RELEASED	UNITS	1ST QUARTER	2ND QUARTER
TRITIUM (HYDROGEN-3)	Ci	4.0E-02	2.6E-01

TOTAL BUILDING RELEASE:	Ci	1.6E+01	3.6E+00

Note: Less than (<) values are not included in the Total Building Release value.

TABLE 3-4

WNP-2 GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES
REPORT PERIOD: JANUARY - JUNE 1992

	UNITS	1ST QUARTER	2ND QUARTER	*EST. TOTAL ERROR
A. FISSION AND ACTIVATION GASES				
1. TOTAL RELEASE	Ci	7.8E+01	6.6E+00	36%
2. AVG. RELEASE RATE FOR PERIOD	uCi/sec	1.0E+01	8.4E-01	
3. PERCENT OF ODCM LIMIT	%	7.8E-01	1.3E-02	
B. IODINES				
1. TOTAL IODINE RELEASE	Ci	4.5E-02	2.9E-02	36%
2. AVG. RELEASE RATE FOR PERIOD	uCi/sec	5.7E-03	3.7E-03	
3. PERCENT OF ODCM LIMIT	%	2.4E-01	1.2E-01	
C. PARTICULATES				
1. TOTAL PARTICULATE RELEASE	Ci	2.3E-02	4.5E-03	36%
2. AVG. RELEASE RATE FOR PERIOD	uCi/sec	2.9E-03	5.7E-04	
3. PERCENT OF ODCM LIMIT	%	2.4E-01	1.2E-01	
4. GROSS ALPHA ACTIVITY	Ci	8.3E-04	6.6E-04	
D. TRITIUM				
1. TOTAL TRITIUM RELEASE	Ci	6.4E+00	2.3E+00	36%
2. AVG. RELEASE RATE FOR PERIOD	uCi/sec	8.2E-01	2.9E-01	
3. PERCENT OF ODCM LIMIT	%	2.4E-01	1.2E-01	

* At 95% confidence level

TABLE 3-5

WNP-2 GASEOUS EFFLUENTS - BATCH RELEASES
REPORT PERIOD: JANUARY - JUNE 1992

TYPE	NUMBER	TOTAL TIME (hr)	MAXIMUM TIME (hr)	MINIMUM TIME (hr)	MEAN TIME (hr)
PURGE	3	17.3	7.3	3.1	5.8
VENT	30	32.5	3.1	0.5	1.1

4.0 SOLID RADWASTE

A total volume of 6194.6 ft^3 (175.3 m^3) of solid waste was transported in 27 shipments during the January through June 1992 reporting period. The reported volumes are the disposal volumes of the containers shipped for burial. The total activity of the waste shipped was 470 Ci; 469.4 Ci was contained in dewatered spent resins, 0.325 Ci was contained in DAW and 0.235 Ci was contained in solidified liquids.

A. Dewatered Spent Resin

Dewatered resins accounted for 3194.6 ft^3 (90.4 m^3) of the radioactive wastes shipped during the reporting period. The burial containers were ES-190, EL-142 and EA-142 liners provided by NUPAC Services, Inc. The total activity of the resins shipped during the reporting period was 469.4 Ci. The principal nuclides and their percent contribution to the total activity are listed in Table 4-3. The solid wastes were shipped to the U S Ecology Hanford Burial Site using NUPAC 10-142 or NUPAC 14-210 casks.

The counting error associated with the total activity has consistently been found to be less than 3.0% at one standard deviation for previous reporting periods. The statistical counting error is assumed to be 3.0% for the purpose of this error evaluation.

Other parameters considered in estimating the total error of the activity shipped included the error in measuring the absolute volume, the weight of the waste in the liners, the representativeness of the sample taken, the homogeneity of the nuclide distribution within a batch or liner and the geometry error in the gamma spectroscopy analysis. The gamma spectroscopy calibration error is approximately 5%. The best estimate of the total error in the activity of spent resin shipped is assumed to be less than or equal to 25%.

B. Dry Active Waste (DAW)

A total of 2775 ft^3 (78.5 m^3) of DAW was shipped in Container Products Corporation B-25 boxes or NUPAC Services ES-190 encapsulation liners. The total activity of the DAW shipped was 0.325 Ci. The value of the activity shipped was determined by using computerized dose rate-to-Curie conversion factors. The conversion factors were based on a nuclide distribution taken from analysis of contamination found in the major DAW production areas. This distribution is updated annually in conjunction with offsite analyses of hard-to-measure nuclides. A meaningful counting error cannot be generated for DAW; however, the total error may be assumed to be less than or equal to 25%, since DAW would be subjected to similar error contributions as spent resin.

C. Other Waste

A total of 225 ft^3 (6.4 m^3) of aqueous liquid was solidified using an approved solidification agent (Aquaset) and was shipped for burial in Type A, 17H or 17C drums. The total activity was 0.235 Ci. The activity was determined by using computerized dose rate-to-Curie conversion factors. The isotopic distribution for this waste was a composite consisting of DAW scaling factors for C-14, Tc-99, I-129 and Fe-55, plus an in-house measured Tritium (H-3) and gamma isotopic distribution for reactor coolant (decayed 30 days). The distribution will be updated annually in conjunction with offsite analyses of hard-to-measure nuclides. This distribution is subject to the same error components as resins and DAW. Therefore, the total error may be assumed to be less than or equal to 25%.

4.1 Scaling Factor Methodology

Scaling factors are based on outside laboratory (SCIENTECH Inc. formerly SAIC) analysis of hard-to-measure nuclides. Scaling factors are updated on an annual basis or when triggered by an order of magnitude change in corrosion to fission product ratios (Co-60/Cs-137) in the resin waste streams, as compared to the previous offsite analysis.

C-14, Ni-63, Fe-55

The ratio of each of these nuclides to Co-60 is determined after outside laboratory analysis of each waste stream. The resulting scaling factors are applied to the measured Co-60 concentration for a particular batch or container of radwaste to arrive at the C-14, Ni-63 and Fe-55 concentrations.

H-3, Tc-99, I-129, Sr-90

The ratio of each of these nuclides to Cs-137 is determined after outside laboratory analysis of each waste stream. The resulting scaling factors are applied to the measured Cs-137 concentration for a particular batch or container of radwaste to arrive at the H-3, Tc-99, I-129 and Sr-90 concentrations.

Transuranics

The ratio of hard to measure TRU nuclides to Ce-144 is determined after outside laboratory analysis of each waste stream, as recommended by the AIF report, "Methodologies for Classification of Low Level Radioactive Waste for Nuclear Power Plants." These nuclides will be reported if Ce-144 is detected and TRU nuclides have been detected by outside laboratory analyses. TRU nuclides include Pu-239, Pu-238, Pu-241, Am-241, Cm-242 and Cm-244.

Outside laboratory LLDs must be at least 1 nCi/g for TRU, 35 nCi/g for PU-241 and 200 nCi/g for Cf-242.

SCALING FACTORS

TABLE 4-1 - REQUIRED NUCLIDES

RATIO	DAW	RWCU POWDER RESIN	CFD POWDER RESIN	EDF/FDR POWDERED RESIN	EDR/FDR BEAD RESIN
H-3/ CS-137	1.97E+00*	1.88E-06*	6.34E-02*	1.07E-04*	1.27E-02*
C-14/ CO-60	2.25E-03*	8.63E-06	1.32E+00	2.61E-04	3.20E-03
Tc-99/ Cs-137	3.11E-01*	1.37E-06*	8.76E-03*	9.82E-06*	2.97E-03*
I-129/ Cs-137	4.02E-01*	1.44E-05*	1.24E-02*	8.04E-06*	2.41E-03*

* Scaling factor based on LLD value.

TABLE 4-2 - CONDITIONAL NUCLIDES

RATIO	DAW	RWCU POWDER RESIN	CFD POWDER RESIN	EDF/FDR POWDERED RESIN	EDR/FDR BEAD RESIN
Ni-63/Co-60	NOTE 1	5.12E-03	3.32E-02	1.84E-01	NOTE 1
Fe-55/Co-60	2.36E-01	9.83E-02	2.23E-01	2.46E-01	NOTE 1
Sr-90/Cs-137	NOTE 1	1.30E-02	1.92E-01	2.81E-03	4.84E-02
Pu-239,240 /Ce-144	NOTE 1	9.65E-02	NOTE 1	2.60E-03	NOTE 1
Pu-238/Ce-144	NOTE 1	4.70E-02	NOTE 1	7.03E-03	NOTE 1
Pu-241/Ce-144	NOTE 1	5.50E+00	NOTE 1	2.14E-01	NOTE 1
Am-241/Ce-144	NOTE 1	8.29E-03	2.56E-04	NOTE 1	NOTE 1
Cm-242/Ce-144	NOTE 1	9.25E-03	7.80E-03	2.75E-02	NOTE 1
Cm-243,244/ Ce-144	NOTE 1	1.13E-02	4.08E-04	NOTE 1	NOTE 1

NOTE 1: Isotope not identified by offsite laboratory analysis.

TABLE 4-3
WNP-2 SOLID WASTE SHIPMENTS

JANUARY - JUNE 1992

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

1. Type of Waste

Waste Stream	Unit	6-month Period	Est. Total Error %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m^3 Ci	90.4 469.4	25
b. Dry active waste, contaminated equip., etc.	m^3 Ci	78.5 0.325	25
c. Irradiated components, control rods, etc.	m^3 Ci	No Shipment	
d. Other, (absorbed aqueous liquid)	m^3 Ci	6.4 0.235	25

2. Estimate of major nuclide composition (by type of waste):

a. Dewatered Spent Resins **

Nuclide	%	Ci
Zn-65	37.3	175
Co-60	28.5	134
Cr-51	7.6	35.5
Cs-137	4.9	23.1
Cs-134	4.2	19.8
Fe-55*	4.0	18.8
Co-58	2.7	12.7
Sr-89	2.4	11.4
Mn-54	2.1	9.84
Ni-63*	1.5	7.23
Ce-144	1.5	6.97
Ba/La-140	1.2	5.49

*Indicates scaled nuclide

**Nuclides contributing < 1 percent (%) of total are not listed.

b. Dry Active Waste (DAW) **

Nuclide	%	Ci
Co-60	72.6	0.236
Fe-55*	17.1	0.056
Zn-65	6.8	0.022
Sb-125	2.3	0.008
Mn-54	1.2	0.004

*Indicates scaled nuclide

**Nuclides contributing < 1 percent (%) of total are not listed.

c. Irradiated Components - None

d. Other Waste - Solidified Liquids **

Nuclide	%	Ci
Co-60	33.0	0.078
Zn-65	23.5	0.055
Cr-51	16.3	0.038
H-3	13.5	0.032
Fe-55*	7.9	0.018
Co-58	2.9	0.007
Mn-54	1.3	0.003

*Indicates Scaled Nuclide

**Nuclides contributing < 1 percent (%) of total are not listed.

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
27	10-142 Cask (9) 14-210 Cask (12) Flatbed (6)	US Ecology Richland,WA

5.0 METEOROLOGY

The meteorological data for the first half of calendar year 1992 will be included the Semiannual Radioactive Effluent Release Report due 60 days after January 1, 1993, and will include data covering the full calendar year 1992. A planned outage of the main meteorological tower occurred during the 2nd Quarter 1992 driven by the WNP-2 computer outage.

6.0 DOSE ASSESSMENT IMPACT ON MAN

The dose impact on man for the Calendar Year 1992 will be included in Semiannual Radioactive Effluent Release Report due 60 days after January 1, 1993.

7.0 REVISIONS TO THE ODCM

During this reporting period there were no amendments to the Offsite Dose Calculation Manual (ODCM) reviewed and accepted by the Plant Operations Committee (POC) and approved by the Plant Manager.

8.0 REVISIONS TO THE PROCESS CONTROL PROGRAM (PCP)

There have been no significant changes to the Process Control Program (PCP) during the reporting period. The PCP implementing procedure (PPM 1.12.2) was revised to provide clarity effective 01/20/92.

9.0 NEW OR DELETED LOCATIONS FOR DOSE ASSESSMENTS AND/OR ENVIRONMENTAL MONITORING LOCATIONS

9.1 Locations where GASPAR II dose calculations were performed for the first and second quarters of 1992:

9.1.1 4.5 miles east southeast (ESE) for the highest organ dose using ground, vegetation and inhalation pathways.

9.1.2 6.4 miles southeast (SE) for the highest organ dose using ground, meat, cow milk, and inhalation pathways.

9.1.3 4.1 miles east southeast (ESE) for the highest organ dose using ground, vegetable and inhalation pathways.

9.1.4 4.3 miles northeast (NE) for the highest organ dose using ground and inhalation pathways.

9.1.5 4.1 miles east northeast (ENE) for the highest organ dose using ground, vegetable and inhalation pathways.

9.2 Environmental monitoring locations which have been added during this reporting period are as follows.

9.2.1 Station 59, 9.6 miles SE, milk sampling was re-established at this location.

9.2.2 Station ST 101, 0.23 miles ENE, storm drain; this location will be sampled for water, sediment, soil and vegetation.

9.2.3 Station ST 102, 0.36 miles SE, sanitary waste treatment facility; this location will be sampled for water and sediment.

9.2.4 Station ST 118, 0.27 miles S, protected storage area; this location will be sampled for soil.

9.3 Station 61, 6.5 miles SE, was discontinued as a TLD and cherry sampling location during this reporting period at the owner's request.

10.0 MAJOR CHANGES TO RADIOACTIVE LIQUID, GASEOUS AND SOLID WASTE TREATMENT SYSTEMS

No major changes were made to the radioactive waste systems (liquid, gaseous, or solid) during this reporting period.