

# REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIOS)

ACCESSION NBR: 8303290401, DOC DATE: 83/03/18, NOTARIZED: NO, DOCKET #:  
 FACIL: 50-397, NPPSS Nuclear Project, Unit: 2, Washington Public Power 05000397,  
 AUTH. NAME: AUTHOR AFFILIATION:  
 BOUCHEN, GLO, Washington Public Power Supply System  
 RECIPI. NAME: RECIPIENT AFFILIATION:  
 SCHWENCER, A., Licensing Branch 2.

SUBJECT: Forwards draft EIS re instrumentation & radioactive effluents.

DISTRIBUTION CODE: C001S COPIES RECEIVED: LITR: 1 ENCL: 10 SIZE: 6.4  
 TITLE: Licensing Submittals Environmental Rept And Related Correspondence

## NOTES:

	RECIPIENT ID CODE/NAME		COPIES LITR ENCL		RECIPIENT ID CODE/NAME		COPIES LITR ENCL
	NRR/LB2/BCI	18	1	1	NRR/LB2/LAI	19	1 1
	AULUCK, R.	04	1	1			
INTERNAL:	ELD/HDS2		1	0	NRR/DE/AEAB	08	1 1
	NRR/DE/EEB	06	1	1	NRR/DE/EHEB		1 1
	NRR/DE/SAB	07	1	1	NRR/DSI/MEITB		1 1
	NRR/DSI/RAB	09	1	1	<u>REG FILE</u>		1 1
	RGN5		1	1			
EXTERNAL:	ACRS	20	6	6	LPDR	03	1 1
	NRCI POR	02	1	1	NSICI	05	1 1
	NTIS		1	1			

TOTAL NUMBER OF COPIES REQUIRED: LITR: 22. ENCL: 11 Encl

Handwritten text at the top of the page, including a date and several lines of notes.

Handwritten text in the middle section, possibly a list or a series of entries.

Small handwritten notes or a signature at the bottom of the page.

## Washington Public Power Supply System

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

March 18, 1983  
G02-83-240  
NS-L-02-CDT-83-027

Docket No. 50-397

Director of Nuclear Reactor Regulation  
Attention: Mr. A. Schwencer, Chief  
Licensing Branch No. 2  
Division of Licensing  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Mr. Schwencer:

Subject: NUCLEAR PROJECT NO. 2  
DRAFT ENVIRONMENTAL TECHNICAL SPECIFICATIONS

Enclosed for your review are ten (10) copies of the initial submittal of the draft Environmental Technical Specifications for WNP-2.

Very truly yours,



G. D. Bouchey  
Manager, Nuclear Safety and Regulatory Programs

CDT/jca  
Enclosure

cc: R Auluck - NRC  
WS Chin - BPA  
R Feil - NRC Site

COOL  
2  
1/10

12

**DRAFT**

INSTRUMENTATION

3/4.3.7 MONITORING INSTRUMENTATION

RADIATION MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.7.1 The radiation monitoring instrumentation channels shown in Table 3.3.7.1-1 shall be OPERABLE with their alarm/trip setpoints within the specified limits.

APPLICABILITY: As shown in Table 3.3.7.1-1.

ACTION:

- a. With a radiation monitoring instrumentation channel alarm/trip setpoint exceeding the value shown in Table 3.3.7.1-1, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.
- b. With one or more radiation monitoring channels inoperable, take the ACTION required by Table 3.3.7.1-1.
- c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.7.1 Each of the above required radiation monitoring instrumentation channels shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations for the conditions and at the frequencies shown in Table 4.3.7.1-1.

*NOTE: Explanation of changes to this section on 10-1-60.*

Table 3.3.7.1-1 "RADIATION MONITORING INSTRUMENTATION" was modified to be consistent with other nuclear plant technical specifications. The following changes were made:

- (1) Off-Gas Pre-treatment Radiation Monitor - located on table 3.3.7.12-1 & table 4.3.7.12-1.
- (2) Reactor Building Vent Radiation Monitor - located on table 3.3.7.12-1 and table 4.3.7.12-1 "REACTOR BUILDING ELEVATED RELEASE MONITOR".
- (3) Off-Gas Post-Treatment Radiation Monitor - located on table 3.3.7.12-1 and table 4.3.7.12-1.
- (4) Standby Gas Treatment System Exhaust Monitor - This system has the "REACTOR BUILDING ELEVATED RELEASE MONITOR" as its monitor - located on tables 3.3.7.12-1 & 4.3.7.12-1.
- (5) Area Monitors (b). Control Room Direct Radiation Monitor - This is currently not a techspec item consistent with similar nuclear power stations.

TABLE 3.3.7.1-1

RADIATION MONITORING INSTRUMENTATION

<u>INSTRUMENTATION</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE CONDITIONS</u>	<u>ALARM/TRIP SETPOINT</u>	<u>ACTION</u>
1. Main Control Room Ventilation Radiation Monitor	2/(intake)	1,2,3,5 and *	$\leq (4) \text{ mR/hr}$	70
2. Area Monitors				
a. Criticality Monitors				
1) New Fuel Storage Vault	1	#	$\leq (15) \text{ mR/hr}^{(a)}$	71
2) Spent Fuel Storage Pool	1	##	$\leq (15) \text{ mR/hr}^{(a)}$	71





TABLE 3.3.7.1-1 (Continued)  
RADIATION MONITORING INSTRUMENTATION

TABLE NOTATION

\*When the main condenser air evacuation system is in operation.

(a) Alarm only.

#With fuel in the new fuel storage vault.

##With fuel in the spent fuel storage pool.

TABLE 3.3.7.1-1 (Continued)

RADIATION MONITORING INSTRUMENTATION

ACTION

ACTION 70 -

- a. With one of the required monitors inoperable, place the inoperable channel in the (downscale) tripped condition within one hour; restore the inoperable channel to OPERABLE status within 7 days, or, within the next 6 hours, initiate and maintain operation of the control room emergency filtration system in the (isolation) mode of operation.
- b. With both of the required monitors inoperable, initiate and maintain operation of the control room emergency filtration system in the (isolation) mode of operation within one hour.

ACTION 71 -

With the required monitor inoperable, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

TABLE 4.3.7.1-1

RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENTATION</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED</u>
1. Main Control Room Ventilation Radiation Monitor	S	M	R	1, 2, 3, 5 and A
7. Area Monitors				
a. Criticality Monitors				
1) New Fuel Storage Vault	S	M	R	R
2) Spent Fuel Storage Pool	S	M	R	RR



1

3

2

TABLE 4.3.7.1-1 (Continued)

RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TABLE NOTATION

- #With fuel in the new fuel storage vault.
- ##With fuel in the spent fuel storage pool.
- \*When the main condenser air evacuation system is in operation.



BASES

3/4.3.5 REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

The reactor core isolation cooling system actuation instrumentation is provided to initiate actions to assure adequate core cooling in the event of reactor isolation from its primary heat sink and the loss of feedwater flow to the reactor vessel without providing actuation of any of the emergency core cooling equipment.

Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is equal to or less than the drift allowance assumed for each trip in the safety analyses.

3/4.3.6 CONTROL ROD BLOCK INSTRUMENTATION

The control rod block functions are provided consistent with the requirements of the specifications in Section 3/4.1.4, Control Rod Program Controls and Section 3/4.2 Power Distribution Limits. The trip logic is arranged so that a trip in any one of the inputs will result in a control rod block.

Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is equal to or less than the drift allowance assumed for each trip in the safety analyses.

3/4.3.7 MONITORING INSTRUMENTATION

3/4.3.7.1 RADIATION MONITORING INSTRUMENTATION

The OPERABILITY of the radiation monitoring instrumentation ensures that; (1) the radiation levels are continually measured in the areas served by the individual channels; (2) the alarm or automatic action is initiated when the radiation level trip setpoint is exceeded; and (3) sufficient information is available on selected plant parameters to monitor and assess these variables following an accident. This capability is consistent with 10 CFR 50, Part 50, Appendix A, General Design Criteria 19, 41, 60, 61, 63 and 64.

3.4.3.7.2 SEISMIC MONITORING INSTRUMENTATION

The OPERABILITY of the seismic monitoring instrumentation ensures that sufficient capability is available to promptly determine the magnitude of a seismic event and evaluate the response of those features important to safety. This capability is required to permit comparison of the measured response to that used in the design basis for the unit. (This instrumentation is consistent with the recommendations of Regulatory Guide 1.12, "Instrumentation for Earthquakes," April 1974.)

DEC 21 1982

## INSTRUMENTATION

### RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

#### LIMITING FOR OPERATION

3.3.7.11 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.3.7.11-1 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.1.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined in accordance with the methodology and parameters described in the Offsite Dose Calculation Manual (ODCM).

APPLICABILITY: At all times.

#### ACTION:

- a. With a radioactive liquid effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above specification, immediately suspend the release of radioactive liquid effluents monitored by the affected channel or declare the channel inoperable.
- b. With less than the minimum number of radioactive liquid effluent monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 3.3.7.11-1. Restore the inoperable instrumentation to OPERABLE status within the time specified in the ACTION or explain why this inoperability was not corrected in a timely manner in the next Semiannual Radioactive Effluent Release Report.
- c. The provisions of Specifications 3.0.3, and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

4.3.7.11 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations at the frequencies shown in Table 4.3.7.11-2.



TABLE 3.3.7.11-1

Radioactive Liquid Effluent Monitoring Instrumentation

<u>Instrument</u>	<u>Minimum Channels Operable</u>	<u>Action</u>
1. Gross Radioactivity Monitors Providing Automatic Termination of Release		
a. Liquid Radwaste Effluent Line	1	100
2. Gross Radioactivity Monitors Not Providing Automatic Termination of Release		
a. Service Water System Effluent Line	1	101
b. RHR Service Water System Effluent Line	1/Loop	101
3. Flow Rate Measurement Devices		
a. Liquid Radwaste Effluent Line	1	102
b. Plant Discharge - Blowdown Line	1	102

3/4 3-87

Washington Nuclear - Unit 2

TABLE 3.3.7:T1-1 (Continued)

TABLE NOTATION

- ACTION 100 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases may continue for up to 14 days provided that prior to initiating a release:
- a. At least two independent samples are analyzed in accordance with Specification 4.11.1.1.1
  - b. At least two technically qualified members of the Facility Staff independently verify the release rate calculations and discharge line valving;
- Otherwise, suspend release of radioactive effluents via this pathway.
- ACTION 101 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 30 days provided that, at least once per 8 hours, grab samples are collected and analyzed for gross radioactivity (beta or gamma) at a limit of detection of at least  $10^{-7}$  microcuries/ml.
- ACTION 102 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 30 days provided the flow rate is estimated at least once per 4 hours during actual releases.

TABLE 4.3.7.11-2

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>SOURCE CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>
1. Gross Radioactivity Monitors Providing Automatic Termination of Release				
a. Liquid Radwaste Effluent Line	P*	P	R(3)	Q(1)
2. Gross Radioactivity Monitors Not Providing Automatic Termination of Release				
a. Service Water System Effluent Line	D	M	R(3)	Q(2)
b. RHR Service Water System Effluent Line	D	M	R(3)	Q(2)
3. Flow Rate Measurement Devices				
a. Liquid Radwaste Effluent Line	D(4)	N.A.	R	Q
b. Plant Discharge-Blowdown Line	D(4)	N.A.	R	Q

\*Perform CHANNEL CHECK at least one per 24 hours if discharge valve interlocks referenced in Table 3.3.7.11-1 are not functioning.

TABLE 4.3.7.11-2 (Continued)

TABLE NOTATION

- (1) The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occur if any of the following conditions exists:
  1. Instrument indicates measured levels above the alarm/trip setpoint.
  2. Circuit failure.
  3. Instrument indicates a downscale failure.
- (2) The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exists:
  1. Instrument indicates measured levels above the alarm setpoint.
  2. Circuit failure.
  3. Instrument indicates a downscale failure.
  4. Instrument controls not set in operate mode.
- (3) The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards shall permit calibrating the system over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration shall be used. (Operating plants may substitute previously established calibration procedures for this requirement.)
- (4) CHANNEL CHECK shall consist of verifying indication of flow during periods of release. CHANNEL CHECK shall be made at least once per 24 hours on days on which continuous, periodic, or batch releases are made.

## INSTRUMENTATION

### RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

#### LIMITING CONDITION FOR OPERATION

---

3.3.7.12 The radioactive gaseous effluent monitoring instrumentation channels shown in Table 3.3.7.12-1 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.2.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined in accordance with the methodology and parameters described in the ODCM.

APPLICABILITY: As shown in Table 3.3.7.12-1

#### ACTION:

- a. With a radioactive gaseous effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above specification, immediately suspend the release of radioactive gaseous effluents monitored by the affected channel or declare the channel inoperable.
- b. With less than the minimum number of radioactive gaseous effluent monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 3.3.7.12-1. Restore the inoperable instrumentation to OPERABLE status within the time specified in the ACTION or explain why this inoperability was not corrected in a timely manner in the next Semiannual Radioactive Effluent Release Report.
- c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.3.7.12 Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations at the frequencies shown in Table 4.3.7.12-2.

TABLE 3.3.7.12-1

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

<u>Instrument</u>	<u>Minimum Channels Operable</u>	<u>Applicable</u>	<u>Action</u>
1. Main Condenser Off-Gas Post-Treatment Monitor			
a. Gross Gamma Detector Alarm and Automatic Isolation of the Off-Gas System Outlet and Drain Valves.	2	**	110
2. Main Condenser Offgas Pre-Treatment Monitor			
a. Gamma sensitive ion-chamber located upstream of holdup line	1	**	115
3. Reactor Building Elevated Release Monitor			
a. Noble Gas Activity Monitor	1	*	110
b. Iodine Sampler	1	*	112
c. Particulate Sampler	1	*	112
d. Effluent System Flow Rate Monitor	1	*	114
e. Sampler Flow Rate Monitor	1	*	114
4. Turbine Building Ventilation Exhaust Monitor			
a. Noble Gas Activity Monitor	1	*	110
b. Iodine Sampler	1	*	112
c. Particulate Sampler	1	*	112
d. Effluent System Flow Rate Monitor	1	*	114
e. Sampler Flow Rate Monitor	1	*	114

TABLE 3.3.7.12-1 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

<u>Instrument</u>	<u>Minimum Channels Operable</u>	<u>Applicable</u>	<u>Action</u>
5. Rad-Waste Building Ventilation Exhaust			
a. Noble Gas Activity Monitor	1	*	110
b. Iodine Sampler	1	*	112
c. Particulate Sampler	1	*	112
d. Effluent System Flow Rate Monitor	1	*	114
e. Sampler Flow Rate Monitor	1	*	114
6. Main Condenser Off-Gas Treatment Explosive Gas Monitoring			
a. Hydrogen	2	**	111

TABLE NOTATION

\* At all times

\*\* During Main Condenser Off-Gas Treatment System Operation

ACTION 110 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 30 days provided grab samples are taken at least once per 8 hours and these samples are analyzed for noble gas gamma emitters within 24 hours.

ACTION 111 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, operation of main condenser offgas treatment system may continue for up to 30 days provided grab samples are collected at least one per 4 hours and analyzed within the following 4 hours. If the recombiner(s) temperature remains constant and THERMAL POWER has not changed, the grab sample collection frequency may be changed to 8 hours.

ACTION 112 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 30 days provided samples are continuously collected with auxiliary sampling equipment as required in Table 4.11.2-1.

ACTION 113 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 30 days provided the flow rate is estimated at least once per 4 hours.

ACTION 114 - With the number of channels OPERABLE less than required by the minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 30 days provided the flow rate is estimated at least once per 4 hours.

ACTION 115 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, releases to the environment may continue for up to 72 hours provided:

- a. The offgas system is not bypassed, and
- b. The Turbine Building vent noble gas activity monitor is OPERABLE;

Otherwise, be in at least STARTUP/HOT STANDBY within 12 hours.



TABLE 4.3.7.12-1

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>SOURCE CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS FOR WHICH SURVEIL- LANCE REQUIRED</u>
1. Main Condenser Off-Gas Post Treatment Monitor					
a. Gross gamma detector alarm and automatic isolation of the off gas system outlet and drain valves	D	D	Q(1)	R(2)	*
2. Main Condenser Off-Gas Pre-Treatment Monitor					
a. Gamma sensitive ion-chamber located upstream of hold up line	D	M	Q(1)	R(2)	**
3. Reactor Building Elevated Release Monitor					
a. Noble Gas Activity Monitor	D	M	Q(1)	R(2)	*
b. Iodine Sampler	W	N.A.	N.A.	N.A.	*
c. Particulate Sampler	W	N.A.	N.A.	N.A.	*
d. Effluent System Flow Rate Monitor	D	N.A.	Q	R	*
e. Sampler Flow Rate Monitor	D	N.A.	Q	R	*
4. Turbine Building Ventilation Exhaust Monitor					
a. Noble Gas Activity Monitor	D	M	Q(1)	R(2)	*
b. Iodine Sampler	W	N.A.	N.A.	N.A.	*
c. Particulate Sampler	W	N.A.	N.A.	N.A.	*
d. Effluent System Flow Rate Monitor	D	N.A.	Q	R	*
e. Sampler Flow Rate Monitor	D	N.A.	Q	R	*

TABLE 4.3.7.12-1 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>SOURCE CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>OPERATIONAL CONDITIONS FOR WHICH SURVEIL- LANCE REQUIRED</u>
5. Rad-Waste Building Ventilation Exhaust Monitor					
a. Noble Gas Activity Monitor	D	M	Q(1)	R(2)	*
b. Iodine Sampler	W	N.A.	N.A.	N.A.	*
c. Particulate Sampler	W	N.A.	N.A.	N.A.	*
d. Effluent System Flow Rate Monitor	D	N.A.	Q	R	*
e. Sampler Flow Rate Monitor	D	N.A.	Q	R	*
6. Main Condenser Off-Gas Treatment System Explosive Gas Monitoring System					
a. Hydrogen Monitor	D	N.A.	M	Q(3)	**

TABLE NOTATION

- \* At all times
- \*\* During Main Condenser Off-Gas Treatment System Operation

- (1) The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exists:
  1. Instrument indicates measured levels above the alarm setpoint.
  2. Circuit failure.
  3. Instrument controls not set in the Operate mode.
- (2) The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards shall permit calibrating the system over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration shall be used. Operating plants may substitute previously established calibration procedures for this requirement.
- (3) The CHANNEL CALIBRATION shall include the use of standard gas samples containing a nominal:
  1. 0.5 volume percent hydrogen, balance nitrogen, and
  2. Four volume percent hydrogen, balance nitrogen.

## INSTRUMENTATION

### 3/4.11.1 LIQUID EFFLUENTS

#### CONCENTRATION

#### LIMITING CONDITION FOR OPERATION

---

3.11.1.1 The concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS (see Figure 5.1.1-1) shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table 11, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to the concentrations specified in Table 3.11.1.1-1.

APPLICABILITY: At all times.

#### ACTION:

With the concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS exceeding the above limits, immediately restore the concentration to within the above limits.

#### SURVEILLANCE REQUIREMENTS

---

4.11.1.1.1 The radioactivity content of each batch of radioactive liquid waste shall be determined prior to release by sampling and analysis in accordance with Table 4.11.1.1-1. The results of pre-release analyses shall be used with the calculational methods and parameters in the ODCM to assure that the concentration at the point of release is maintained within the limits of Specifications 3.11.1.1.

4.11.1.1.2 Post-release analyses of samples composited from batch releases shall be performed in accordance with Table 4.11.1.1-1. The results of the previous post-release analyses shall be used with the calculational methods and parameters in the ODCM to assure that the concentrations at the point of release were maintained within the limits of Specification 3.11.1.1.

TABLE 3.11.1.1-1

MAXIMUM PERMISSIBLE CONCENTRATION OF  
DISSOLVED OR ENTRAINED NOBLE GASES  
RELEASED FROM THE SITE TO UNRESTRICTED AREAS  
IN LIQUID WASTE

<u>NUCLIDE</u>	<u>MPC ( CI/ml)*</u>
Kr 84 m	2E-4
Kr 85	5E-4
Kr 87	4E-5
Kr 88	9E-5
Ar 41	7E-5
Xe 133 m	5E-4
Xe 133	6E-4
Xe 135 m	2E-4
Xe 135	2E-4

\*Computed from Equation 20 of ICRP Publication 2 (1959), adjusted for infinite cloud submersion in water, and  $R = 0.01$  rem/week,  $P_w = 1.0$  gm/cm<sup>3</sup>, and  $P_w/P_t = 1.0$ .

TABLE 4.11.1.1-1

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

Liquid Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) <sup>a</sup> (Ci/ml)
Batch Waste Release Tanks <sup>b</sup>	P Each Batch	P Each Batch	Principal Gamma Emitters <sup>c</sup>	$5 \times 10^{-7}$
			I-131	$1 \times 10^{-6}$
	P One Batch/M	M	Dissolved and Entrained Gases (Gamma Emitters)	$1 \times 10^{-5}$
	P Each Batch	M Composite <sup>d</sup>	H-3	$1 \times 10^{-5}$
			Gross Alpha	$1 \times 10^{-7}$
	P Each Batch	Q Composite <sup>d</sup>	Sr-89, Sr-90	$5 \times 10^{-8}$
			Fe-55	$1 \times 10^{-6}$

TABLE 4.11.1.1-1 (Continued)

TABLE NOTATION

- a. The LLD is the smallest concentration of radioactive material in a sample that will be detected with 95% probability, with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

$$LLD = \frac{4.66s_b}{E \cdot V \cdot 2.22 \times 10^6 \cdot Y \cdot \exp(-\lambda \Delta t)}$$

Where:

LLD is the "a priori" lower limit of detection as defined above (as microcurie per unit mass or volume),

$s_b$  is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute),

E is the counting efficiency (as counts per transformation),

V is the sample size (in units of mass or volume),

$2.22 \times 10^6$  is the number of transformations per minute per microcurie,

Y is the fractional radiochemical yield (when applicable),

$\lambda$  is the radioactive decay constant for the particular radionuclide, and

$\Delta t$  is the elapsed time between midpoint of sample collection and time of counting (for plant effluents, not environmental samples).

The value of  $s_b$  used in the calculation of the LLD for a detection system shall be based on the actual observed variance of the background counting rate or of the counting rate of the blank samples (as appropriate) rather than on an unverified theoretically predicted variance. Typical values of E, V, Y, and  $\Delta t$  shall be used in the calculation.

TABLE 4.11.1.1-1

TABLE NOTATION

- b. A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analyses, each batch shall be isolated, and then thoroughly mixed to assure representative sampling.
- c. The principal gamma emitters for which the LLD specification applies exclusively are the following radionuclides: Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144. This list does not mean that only these nuclides are to be considered. Other gamma peaks that are identifiable, together with those of the above nuclides, shall also be analyzed and reported in the Semiannual Radioactive Effluent Release Report pursuant to Specification 6.9.1.8.
- d. A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen that is representative of the liquids released.



## RADIOACTIVE EFFLUENTS

### DOSE

#### LIMITING CONDITION FOR OPERATION

---

3.11.1.2 The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released from each reactor unit to UNRESTRICTED AREAS (see Figure 5.1.1-1) shall be limited:

- a. During any calendar quarter to less than or equal to 1.5 mrem to the total body and to less than or equal to 5 mrem to any organ, and
- b. During any calendar year to less than or equal to 3 mrem to the total body and to less than or equal to 10 mrem to any organ.

APPLICABILITY: At all times.

#### ACTION:

- a. With the calculated dose from the release of radioactive materials in liquid effluents exceeding any of the above limits; in lieu of a Licensee Event Report, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions that have been taken to reduce the releases and the proposed corrective actions to be taken to assure that subsequent releases will be in compliance with the above limits. This Special Report shall also include the radiological impact on finished drinking water supplies at the nearest downstream drinking water source.
- b. The provisions of specifications 3.0.3 and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.11.1.2 Cumulative dose contributions from liquid effluents for the current calendar quarter and the current calendar year shall be determined in accordance with the methodology and parameters in the ODCM at least once per 31 days.

## RADIOACTIVE EFFLUENTS

### LIQUID WASTE TREATMENT SYSTEM

#### LIMITING CONDITION FOR OPERATION

---

3.11.1.3 The liquid radwaste treatment system, as described in the ODCM, shall be OPERABLE. The appropriate portions of the system shall be used to reduce the radioactive materials in liquid waste prior to their discharge when the projected doses due to the liquid effluent, from each reactor unit, to UNRESTRICTED AREAS (see Figure 5.1.1-1) would exceed 0.06 mrem to the total body or 0.2 mrem to any organ in a 31 day period.

APPLICABILITY: At all times.

#### ACTION:

- a. With radioactive liquid waste being discharged without treatment and in excess of the above limits, in lieu of a Licensee Event Report, prepare and submit to the Commission within 30 days pursuant to Specification 6.9.2, a Special Report which includes the following information:
  1. Identification of the inoperable equipment or subsystems and the reason for inoperability,
  2. Action(s) taken to restore the inoperable equipment to OPERABLE status, and
  3. Summary description of action(s) taken to prevent a recurrence.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.11.1.3.1 Doses due to liquid releases from each reactor unit to UNRESTRICTED AREAS shall be projected at least once per 31 days in accordance with the methodology and parameters in the ODCM.

4.11.1.3.2 The liquid radwaste treatment system shall be demonstrated OPERABLE by operating the liquid radwaste treatment system equipment for at least 10 minutes at least once per 92 days unless the liquid radwaste system has been utilized to process radioactive liquid during the previous 92 days.

## RADIOACTIVE EFFLUENTS

### LIQUID HOLDUP TANKS

#### LIMITING CONDITION FOR OPERATION

---

3.11.1.4 The quantity of radioactive material contained in any outside temporary tanks shall be limited to less than or equal to the limits calculated in the ODCM.

APPLICABILITY: At all times.

ACTION:

- a. With the quantity of radioactive material in any of the temporary tanks exceeding the above limit, immediately suspend all additions of radioactive material to the tank and within 48 hours reduce the tank contents to within the limit.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.11.1.4 The quantity of radioactive material contained in each of the temporary tanks shall be determined to be within the above limit by analyzing a representative sample of the tank's contents at least once per 7 days when radioactive materials are being added to the tank.

## RADIOACTIVE EFFLUENTS

### 3/4.11.2 GASEOUS EFFLUENTS

#### DOSE RATE

#### LIMITING CONDITION FOR OPERATION

---

3.11.2.1 The dose rate due to radioactive materials released in gaseous effluents from the site (see Figure 5.1.1-1) shall be limited to the following:

- a. For noble gases: Less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin, and
- b. For all radioiodines and for all radioactive materials in particulate form and radionuclides (other than noble gases) with half lives greater than 8 days: Less than or equal to 1500 mrem/yr to any organ.

APPLICABILITY: At all times.

#### ACTION:

With the dose rate(s) exceeding the above limits, immediately decrease the release rate to within the above limit(s).

## SURVEILLANCE REQUIREMENTS

---

4.11.2.1.1 The dose rate due to noble gases in gaseous effluents shall be determined to be within the above limits in accordance with the methods and procedures of the ODCM.

4.11.2.1.2 The dose rate due to radioactive materials, other than noble gases, in gaseous effluents shall be determined to be within the above limits in accordance with the methods and procedures of the ODCM by obtaining representative samples and performing analyses in accordance with sampling and analysis program specified in Table 4.11.2-1.

TABLE 4.11.2-1

## RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

Gaseous Release Type *	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) <sup>a</sup> ( $\mu\text{Ci/ml}$ )
A. Containment Purge	P Each Purge <sup>b</sup> Grab Sample	P Each Purge <sup>b</sup>	Principal Gamma Emitters <sup>f</sup>	$1 \times 10^{-4}$
			H-3	$1 \times 10^{-6}$
B. Reactor Building Vents, & Turbine Building Vents	Mb Grab Sample	Mb	Principal Gamma Emitters <sup>f</sup>	$1 \times 10^{-4}$
			H-3	$1 \times 10^{-6}$
C. All Release Types as listed in A and B.	Continuous	Wc, d Charcoal Sample	I-131	$1 \times 10^{-12}$
	Continuous	Wc, d Particulate Sample	Principal Gamma Emitters <sup>b</sup> (I-131, Others)	$1 \times 10^{-11}$
	Continuous	Q Composite Particulate Sample	Gross Alpha	$1 \times 10^{-11}$
	Continuous	Q Composite Particulate Sample	Sr-89, Sr-90	$1 \times 10^{-11}$
	Continuous	Noble Gas Monitor	Noble Gases Gross Beta or Gamma	$1 \times 10^{-6}$ (XE-133 equivalent)

TABLE 4.11.2-1 (Continued)

TABLE NOTATION

- a. The LLD is the smallest concentration of radioactive material that will be detected with 95% probability with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

$$LLD = \frac{4.66s_b}{E \cdot V \cdot 2.22 \times 10^6 \cdot Y \cdot \exp(-\lambda \Delta t)}$$

Where:

LLD is the "a priori" lower limit of detection as defined above (as microcurie per unit mass or volume),

$s_b$  is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute);

E is the counting efficiency (as counts per transformation),

V is the sample size (in units of mass or volume),

$2.22 \times 10^6$  is the number of transformations per minute per microcurie,

Y is the fractional radiochemical yield (when applicable),

$\lambda$  is the radioactive decay constant for the particular radionuclide, and

$\Delta t$  is the elapsed time between midpoint of sample collection and time of counting (for plant effluents, not environmental samples).

The value of  $s_b$  used in the calculation of the LLD for a detection system shall be based on the actual observed variance of the background counting rate or of the counting rate of the blank samples (as appropriate) rather than on an unverified theoretically predicted variance. Typical values of E, V, Y, and  $\Delta t$  shall be used in the calculation.



TABLE 4.11.2-1 (Continued)

TABLE NOTATION

- b. If the iodine or particulate monitoring channel(s) is(are) inoperative, analyses shall also be performed following shutdown, startup, or a THERMAL POWER change exceeding 15 percent of the RATED THERMAL POWER within a one hour period.
- c. Particulate and/or charcoal samples shall be analyzed when an alarm is received indicating rate of activity buildup exceeds 3 times normal.
- d. Samples shall be changed at least once per 7 days and analyses shall be completed within 48 hours after changing, or after removal from sampler. If the iodine or particulate monitoring channel(s) is(are) inoperative, sampling shall also be performed at least once per 24 hours for at least 7 days following each shutdown, startup or THERMAL POWER change exceeding 15 percent of RATED THERMAL POWER in one hour and analyses completed within 48 hours of changing. When samples collected for 24 hours are analyzed, the corresponding LLDs may be increased by a factor of 10.
- e. The ratio of the sample flow rate to the sampled stream flow rate shall be known for the time period covered by each dose or dose rate calculation made in accordance with Specifications 3.11.2.1, 3.11.2.2 and 3.11.2.3.
- f. The principal gamma emitters for which the LLD specification applies exclusively are the following radionuclides: Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, and Xe-138 for gaseous emissions and Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141 and Ce-144 for particulate emissions. This list does not mean that only these nuclides are to be detected and reported. Other peaks which are measurable and identifiable, at the 95% confidence level, together with the above nuclides, shall also be identified and reported.



## RADIOACTIVE EFFLUENTS

### DOSE - NOBLE GASES

#### LIMITING CONDITION FOR OPERATION

---

3.11.2.2 The air dose due to noble gases released in gaseous effluents from each reactor unit, to areas at and beyond the SITE BOUNDARY see Figure 5.1.1-1 shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation and
- b. During any calendar year: Less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

APPLICABILITY: At all times.

#### ACTION:

- a. With the calculated air dose from radioactive noble gases in gaseous effluents exceeding any of the above limits, in lieu of a Licensee Event Report, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions that have been taken to reduce the releases and the proposed corrective actions to be taken to assure that subsequent releases will be in compliance with the above limits.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.11.2.2 Dose Calculations Cumulative dose contributions for the current calendar quarter and current calendar year shall be determined in accordance with the ODCM at least once per 31 days.

DOSE - RADIOIODINES, RADIOACTIVE MATERIALS IN PARTICULATE FORM, AND  
RADIONUCLIDES OTHER THAN NOBLE GASES

LIMITING CONDITION FOR OPERATION

3.11.2.3 The dose to an individual from radioiodines and radioactive materials in particulate form, and radionuclides, other than noble gases, with half-lives greater than 8 days in gaseous effluents released, from each reactor unit, from the site (see Figure 5.1.1-1) shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 7.5 mrem to any organ, and
- b. During any calendar year: Less than or equal to 15 mrem to any organ.

APPLICABILITY: At all times.

- a. With the calculated dose from the release of radioiodines, radioactive particulates, and radionuclide (other than noble gases) with half-lives greater than 8 days, in gaseous effluent exceeding any of the above limits, in lieu of a Licensee Event Report, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2 a Special Report identifying the cause(s) for exceeding the limit and defines the corrective action taken to reduce the releases and assure subsequent releases will be in compliance with the above limits.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.3 Dose Calculations Cumulative dose contributions for the current calendar quarter and current calendar year shall be determined in accordance with the ODCM at least once per 31 days.

## RADIOACTIVE EFFLUENTS

### GASEOUS RADWASTE TREATMENT SYSTEM

#### LIMITING CONDITION FOR OPERATION

---

3.11.2.4 The GASEOUS RADWASTE TREATMENT SYSTEM shall be in operation.

APPLICABILITY: Whenever the main condenser steam jet air ejector system is in operation.

#### ACTION:

- a. With the GASEOUS RADWASTE TREATMENT SYSTEM inoperable for more than 7 days, in lieu of a Licensee Event Report, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report which includes the following information:
  1. Identification of the inoperable equipment or subsystems and the reason for inoperability,
  2. Action(s) taken to restore the inoperable equipment to OPERABLE status, and
  3. Summary description of action(s) taken to prevent a recurrent.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.11.2.4 The GASEOUS RADWASTE TREATMENT SYSTEM shall be verified to be in operation at least once per 92 days.

## RADIOACTIVE EFFLUENTS

### VENTILATION EXHAUST TREATMENT SYSTEM

#### LIMITING CONDITION FOR OPERATION

3.11.2.5 The appropriate portions of the VENTILATION EXHAUST TREATMENT SYSTEM shall be OPERABLE and shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected doses due to gaseous effluent releases from each reactor unit to areas at and beyond the SITE BOUNDARY (see Figure 5.1.1-1) when averaged over 31 days would exceed 0.3 mrem to any organ.

APPLICABILITY: At all times.

#### ACTION:

- a. With the VENTILATION EXHAUST TREATMENT SYSTEM inoperable for more than 31 days, or with gaseous waste being discharged without treatment and in excess of the above limits, in lieu of any other report required by Specification 6.9.1, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report which includes the following information:
  1. Identification of the inoperable equipment or subsystems, and the reason for the inoperability,
  2. Action(s) taken to restore the inoperable equipment to OPERABLE status, and
  3. Summary description of action(s) taken to prevent a recurrent.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

4.11.2.5.1 Doses due to gaseous releases from each reactor unit to areas at and beyond the SITE BOUNDARY shall be projected at least once per 31 days in accordance with the methodology and parameters in the ODCM.

4.11.2.5.2 The VENTILATION EXHAUST TREATMENT SYSTEM shall be demonstrated OPERABLE by operating the VENTILATION EXHAUST TREATMENT SYSTEM equipment for at least 10 minutes, at least once per 92 days unless the appropriate system has been utilized to process radioactive gaseous effluents during the previous 92 days.

RADIOACTIVE EFFLUENTS

EXPLOSIVE GAS MIXTURE

LIMITING CONDITION FOR OPERATION

---

3.11.2.6 The concentration of hydrogen in the main condenser offgas treatment system shall be limited to less than or equal to 4% by volume.

APPLICABILITY: Whenever the main condenser air ejector system is in operation.

ACTION:

- a. With the concentration of hydrogen in the main condenser offgas treatment system exceeding the limit, restore the concentration to within the limit within 48 hours.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

---

4.11.2.6 The concentration of hydrogen in the main condenser offgas treatment system shall be determined to be within the above limits by continuously monitoring the waste gases in the main-condenser offgas treatment system with the hydrogen monitors required OPERABLE by Table 3 3.7.12-1 of Specification 3.3.7.12.

## RADIOACTIVE EFFLUENTS

### MAIN CONDENSER

#### LIMITING CONDITION FOR OPERATION

3.11.2.7 The gross radioactivity (beta and/or gamma) rate of noble gases measured at the main condenser air ejector shall be limited to less than or equal to  $(3.323 \times 10^5)$  microcuries/sec after 30 minutes decay).

APPLICABILITY: At all times.

#### ACTION:

With the gross radioactivity (beta and/or gamma) rate of noble gases at the main condenser air ejector exceeding  $(3.323 \times 10^5)$  microcuries/sec after 30 minutes decay), restore the gross radioactivity rate to within its limit within 72 hours or be in at least HOT STANDBY within the next 12 hours.

#### SURVEILLANCE REQUIREMENTS

4.11.2.7.1 The radioactivity rate of noble gases at (near) the outlet of the main condenser air ejector shall be continuously monitored in accordance with Specification 3.3.7.12.

4.11.2.7.2 The gross radioactivity (beta and/or gamma) rate of noble gases from the main condenser air ejector shall be determined to be within the limits of Specification 3.11.2.7 at the following frequencies by performing an isotopic analysis of a representative sample of gases taken at the discharge (prior to dilution and/or discharge) of the main condenser air ejector.

- a. At least once per 31 days.
- b. Within 4 hours following an increase, as indicated by the Condenser Air Ejector Noble Gas Activity Monitor, of greater than 50%, after factoring out increases due to changes in THERMAL POWER level, in the nominal steady state fission gas release from the primary coolant.

## RADIOACTIVE EFFLUENTS

### VENTING OR PURGING

#### LIMITING CONDITION FOR OPERATION

---

3.11.2.8 VENTING or PURGING of the containment drywell shall be through the primary Containment Vent and Purge System or the Standby Gas Treatment System.

APPLICABILITY: Whenever the drywell is vented or purged.

#### ACTION:

- a. With the requirements of the above specification not satisfied, suspend all VENTING and PURGING of the drywell.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.11 2 8 The containment drywell shall be determined to be aligned for VENTING or PURGING through the Primary containment Vent and Purge System or the Standby Gas Treatment System within 4 hours prior to start of and at least once per 12 hours during VENTING or PURGING of the drywell.

## RADIOACTIVE EFFLUENTS

### 3/4.11 3 SOLID RADIOACTIVE WASTE

#### LIMITING CONDITION FOR OPERATION

---

3.11.3 The solid radwaste system shall be OPERABLE and used, as applicable in accordance with a PROCESS CONTROL PROGRAM, for the SOLIDIFICATION and packaging of radioactive wastes to ensure meeting the requirements of 10 CFR Part 20 and of 10 CFR Part 71 prior to shipment of radioactive wastes from the site.

APPLICABILITY: At all times.

#### ACTION:

- a. With the requirements of 10 CFR Part 20, and/or 10 CFR Part 1, not satisfied suspend shipments of defectively processed or defectively packaged solid radioactive wastes from the site.
- b. With the solid radwaste system inoperable for more than 31 days, in lieu of any other report required by Specification 6.9.1, prepare and submit to the Commission within 30 days pursuant to Specification 6.9.2 a Special Report which includes the following information:
  1. Identification of the inoperable equipment or subsystems and the reason for inoperability,
  2. Action(s) taken to restore the inoperable equipment to OPERABLE status,
  3. A description of the alternative used for SOLIDIFICATION and packaging of radioactive wastes. and,
  4. Summary description of action(s) taken to prevent a recurrent.
- c. The provisions of Specifications 3.0 3. 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.11.3.1 The solid radwaste system shall be demonstrated OPERABLE at least once per 92 days by:

- a. Operating the solid radwaste system at least once in the previous 92 days in accordance with the PROCESS CONTROL PROGRAM, or
- b. Verification of the existence of a valid contract for SOLIDIFICATION to be performed by a contractor in accordance with a PROCESS CONTROL PROGRAM.



## RADIOACTIVE EFFLUENTS

### SURVEILLANCE REQUIREMENTS (Continued)

---

4.11.3.2 THE PROCESS CONTROL PROGRAM shall be used to verify the SOLIDIFICATION of at least one representative test specimen from at least every tenth batch of each type of wet radioactive waste (e.g., filter sludges, spent resins, evaporator bottoms, and sodium sulfate solutions).

- a. If any test specimen fails to verify SOLIDIFICATION, the SOLIDIFICATION of the batch under test shall be suspended until such time as additional test specimens can be obtained, alternative SOLIDIFICATION parameters can be determined in accordance with the PROCESS CONTROL PROGRAM, and a subsequent test verifies SOLIDIFICATION. SOLIDIFICATION of the batch may then be resumed using the alternative SOLIDIFICATION parameters determined by the PROCESS CONTROL PROGRAM.
- b. If the initial test specimen from a batch of waste fails to verify SOLIDIFICATION, the PROCESS CONTROL PROGRAM shall provide for the collection and testing of representative test specimens from each consecutive batch of the same type of wet waste until at least 3 consecutive initial test specimens demonstrate SOLIDIFICATION. The PROCESS CONTROL PROGRAM shall be modified as required, as provided in Specification 6.13 to assure SOLIDIFICATION of subsequent batches of waste.

## RADIOACTIVE EFFLUENTS

### 3/4.11.4 TOTAL DOSE

#### LIMITING CONDITION FOR OPERATION

3.11.4 The annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC, due to releases of radioactivity and radiation, from uranium fuel cycle sources shall be limited to less than or equal to 25 mrem to the total body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrem.

APPLICABILITY: At all times.

#### ACTION:

- a. With the calculated doses from the release of radioactive materials in liquid or gaseous effluents exceeding twice the limits of Specifications 3.11.1.2.a, 3.11.1.2.b, 3.11.2.2.a, 3.11.2.2.b, 3.11.2.3.a, or 3.11.2.3.b, calculations should be made including direct radiation contributions from the reactor units and from outside storage tanks to determine whether the above limits of Specification 3.11.4 have been exceeded. If such is the case, in lieu of a Licensee Event Report, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report that defines the corrective action to be taken to reduce subsequent releases to prevent recurrent of exceeding the above limits and includes the schedule for achieving conformance with the above limits. This Special Report shall include an analysis that estimates the radiation exposure (dose) to a MEMBER OF THE PUBLIC from uranium fuel cycle sources, including all effluent pathways and direct radiation, for the calendar year that includes the release(s) covered by this report. It shall also describe levels of radiation and concentrations of radioactive material involved, and the cause of the exposure levels or concentrations. If the estimated dose(s) exceeds the above limits, and if the release condition resulting in violation of 40 CFR 190 has not already been corrected, the Special Report shall include a request for a variance in accordance with the provisions of 40 CFR Part 190. Submittal of the report is considered a timely request, and a variance is not granted until staff action on the request is complete.
- b. The provisions of Specifications 3.0.3, 3.0.4 are not applicable.

## SURVEILLANCE REQUIREMENTS

4.11.4 Dose Calculations Cumulative dose contributions from liquid and gaseous effluents shall be determined in accordance with Specifications 4.11.1.2, 4.11.2.2, and 4.11.2.3, and in accordance with the ODCM.

### 3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

#### 3/4.12.1 MONITORING PROGRAM

##### LIMITING CONDITION FOR OPERATION

3.12.1 The radiological environmental monitoring program shall be conducted as specified in Table 3.12-1.

APPLICABILITY: At all times.

##### ACTION:

- a. With the radiological environmental monitoring program not being conducted as specified in Table 3.12-1, prepare and submit to the Commission, in the Annual Radiological Operating Report, a description of the reasons for not conducting the program as required and the plans for preventing a recurrence. (Deviations are permitted from the required sampling schedule if specimens are unobtainable due to hazardous conditions, seasonal unavailability, malfunction of automatic sampling equipment or other legitimate reasons. Every reasonable effort shall be made to correct all deficiencies prior to the end of the next sampling period. All deviations will be documented in the annual report.)
- b. With the level of radioactivity in an environmental sampling medium exceeding the reporting levels of Table 3.12-2 when averaged over any calendar quarter, prepare and submit to the Commission within 30 days from the end of the affected calendar quarter a special report pursuant to Specification 6.9.2. When more than one of the radionuclides in Table 3.12-2 are detected in the sampling medium, this report shall be submitted if:

$$\frac{\text{concentration (1)}}{\text{limit level (1)}} + \frac{\text{concentration (2)}}{\text{limit level (2)}} + \dots \geq 1.0$$

When radionuclides other than those in Table 3.12-2 are detected and are the result of plant effluents, this report shall be submitted if the potential annual dose to an individual is equal to or greater than the calendar year limits of Specifications 3.11.1.2, 3.11.2.2 and 3.11.2.3.

This report is not required if the measured level of radioactivity was not the result of plant effluents; however, in such an event, the condition shall be reported and described in the Annual Radiological Environmental Operating Report.

- c. With milk or fresh leafy vegetable samples unavailable from one or more of the sample locations required by Table 3.12-1, in lieu of any other report required by Specification 6.9.1, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report which identifies the cause of the unavailability of samples and identifies locations for obtaining replacement samples. The locations from which samples were unavailable may then be deleted from those required by Table 3.12-1, provided the locations from which the replacement samples were obtained are added to the environmental monitoring program as replacement locations.
- d. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

4.12.1 The radiological environmental monitoring samples shall be collected pursuant to Table 3.12-1 from the locations given in this table and shown in Figures 3.12-1a and 3.12-1b and shall be analyzed pursuant to the requirements of Tables 3.12-1 and 4.12-1.

4.12.1.2 Reports - The results of analyses performed on the radiological environmental monitoring samples shall be summarized in the Annual Radiological Operating Report, pursuant to Specifications 6.9.1.6 and 6.9.1.7.

TABLE 3.12-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

<u>Sample Type</u>	<u>Sample Location Code<sup>1*</sup></u>	<u>Sampling and <sup>1</sup> Collection Frequency</u>	<u>Type and Frequency<sup>11</sup> of Analysis</u>
1. AIRBORNE			
a. Particulates and Radioiodine	1, 4-9A, 21, 23, 40, and 48	Continuous Sampling Weekly Collection	Particulate: Gross beta <sup>2</sup> Gamma isotopic <sup>3</sup> on quarterly composite (by location)  Radioiodine: Gamma for I-131 weekly
2. DIRECT RADIATION <sup>4</sup>	1-9A, 10-25, 40-46, 1S-16S	Quarterly	Gamma Dose
3. WATERBORNE			
a. Surface	26 and 27	Composite aliquots monthly <sup>5</sup>	Gamma isotopic <sup>3</sup>
b. Drinking Water	28 and 29	Composite aliquots monthly <sup>5</sup>	Gamma isotopic <sup>3</sup>
c. Ground Water	--	7	7
d. Sediment from Shoreline	33 and 34	Semi-annually	Gamma isotopic <sup>3</sup>

TABLE 3.12-1.  
(Continued)

<u>Sample Type</u>	<u>Sample Location Code<sup>1*</sup></u>	<u>Sampling and Collection Frequency</u>	<u>Type and Frequency<sup>11</sup> of Analysis</u>
4. INGESTION			
a. Milk <sup>8</sup>	9C, 35, 36, and 40	Semi-monthly during grazing season Monthly at other times	Gamma isotopic <sup>3</sup> Iodine - 131
b. Fish <sup>9</sup>	30, 38 and 39	Semi-annually, 4 in vicinity of discharge 1 from Snake River	Gamma isotopic <sup>3</sup> on edible portions
c. Garden Produce <sup>10</sup>	37A and 37B 9B	Monthly during growing season in the River-view area of Pasco; and a control at Grandview	Gamma isotopic <sup>3</sup> on edible portions

\*Sample locations are shown on Figures 3.12-1a and 3.12-1b.

- 1-Deviations are permitted if samples are unobtainable due to hazardous conditions, seasonal availability, malfunction of automatic sampling equipment, or other legitimate reasons. All deviations will be documented in the annual report.
- 2 Particulate sample filters will be analyzed for gross beta after at least 24 hours decay. If gross beta activity is greater than 10 times the mean of the control sample, gamma isotopic analysis should be performed on the individual sample.
- 3 Gamma isotopic means identification and quantification of gamma emitting radionuclides that may be attributable to the effluents of the facility.
- 4 TLDs used in the REMP meet the requirements of ANSI N545-1975 except for the energy dependence (Section 4.3.4) specified for the region between 30-50 kev. TLD locations 1S-16S are sampled to demonstrate compliance with the restricted boundary dose limits.
- 5 Composite samples will be collected with equipment which is capable of collecting an aliquot at time intervals which are short relative to the compositing period.

TABLE 3.12-1  
(Continued)

- 6 Tritium analysis will be performed on a quarterly composited sample.
- 7 Ground water samples are not collected since there are no wells which are presently being used for either drinking or irrigation where the hydraulic gradient or recharge properties are suitable for contamination by WNP-2 effluents.
- 8 Milk samples will be obtained from farms or individual milk animals which are located in sectors with the higher calculated annual average ground-level D/Q's. If Cesium-134 or Cesium-137 is measured in an individual milk sample in excess of 30 pCi/l, then Strontium 90 analysis should be performed.
- 9 The species of interest to be collected are primarily salmonids.
- 10 Garden produce will be obtained from farms or gardens which use Columbia River water, if possible, for irrigation and different varieties will be obtained as they are in season. One sample of root food, leafy vegetables, and fruit should be collected each period.
- 11 Frequency of analysis will be as collected or as stated in these footnotes for special case.

TABLE 3.12-2

Station	Sector	Radial Miles(a)	Direct Radiation Air Particulate & Radioiodines	Surface Water	Drinking Water	Groundwater	Shoreline Sediment	Milk	Fish	Garden Products
1S	N	0.3	X							
2S	NNE	0.4	X							
3S	NE	0.5	X							
4S	ENE	0.4	X							
5S	E	0.4	X							
6S	ESE	0.4	X							
7S	SE	0.5	X							
8S	SSE	0.7	X							
9S	S	0.7	X							
10S	SSW	0.8	X							
11S	SW	0.7	X							
12S	WSW	0.5	X							
13S	W	0.5	X							
14S	WNW	0.5	X							
15S	NW	0.5	X							
16S	NNW	0.4	X							
1	S	1.3	X	X						
2	NNE	1.8	X							
3	SE	2.0	X							
4	SSE	9.3	X	X						
5	ESE	7.7	X	X						
6	S	7.7	X	X						
7	WNW	2.7	X	X						
8	ESE	4.7	X	X						
9A*	WSW	30.0	X	X						
9B*	WSW	35.0								
9C*	WSW	33.0					X		X	
10	E	3.1	X							
11	ENE	2.0	X							
12	NNW	6.1	X							
13	SW	1.4	X							
14	WSW	1.4	X							
15	W	1.4	X							
16	WNW	1.4	X							
17	NNW	1.2	X							
18	N	1.1	X							
19	NE	1.8	X							
20	ENE	1.9	X							

\*Control Location



TABLE 3.12-2

[illegible]

\* Control Location

(a) Taken from center of WNP-2 containment.

(b) Not currently used.

(c) Not currently sampled.

(d) Intake water (station 26) is also the control location for drinking water.

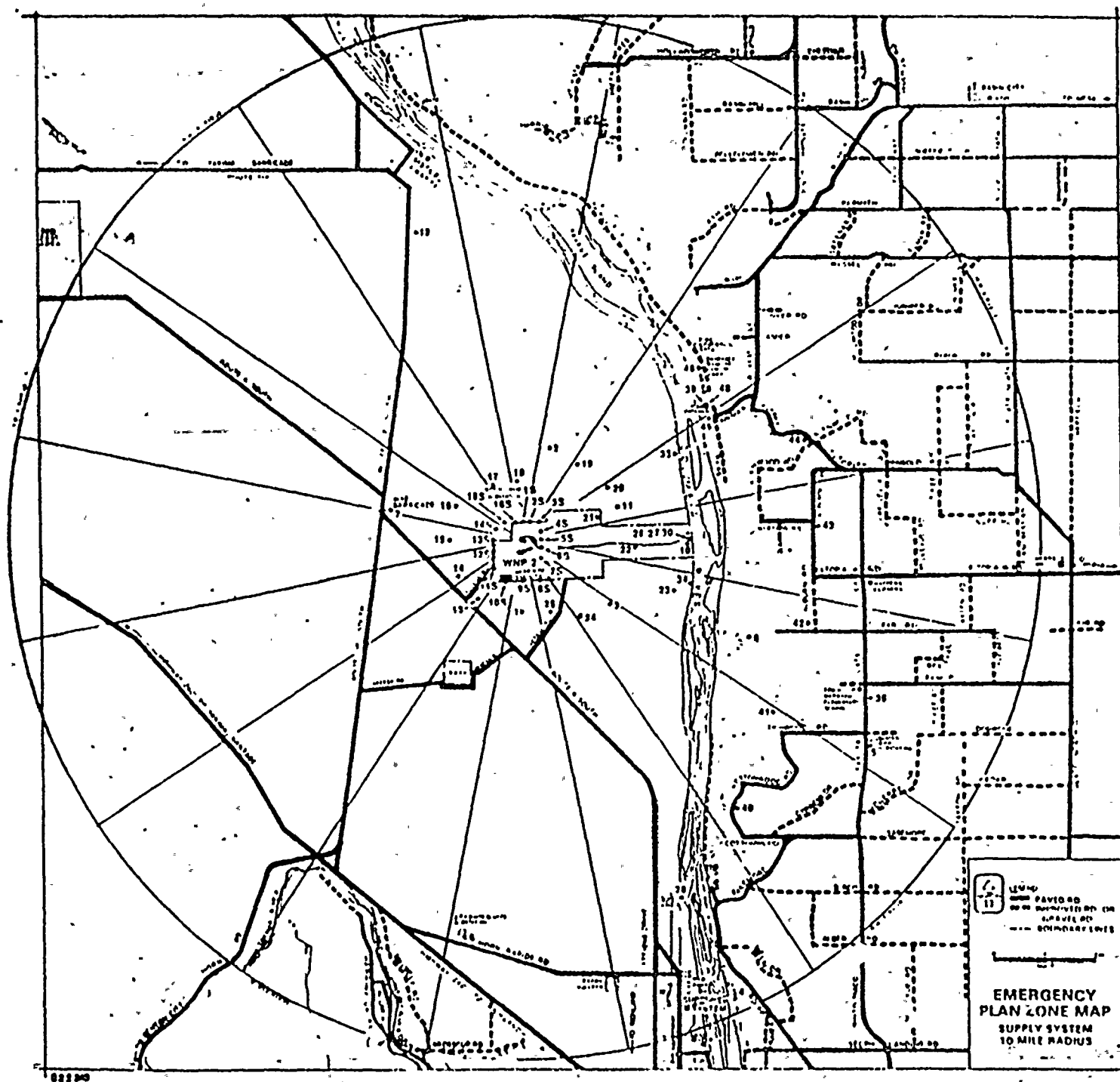


FIGURE 3.12-1(n)  
RADIOLOGICAL ENVIRONMENTAL MONITORING SAMPLE LOCATIONS INSIDE OF 10 MILE RADIUS

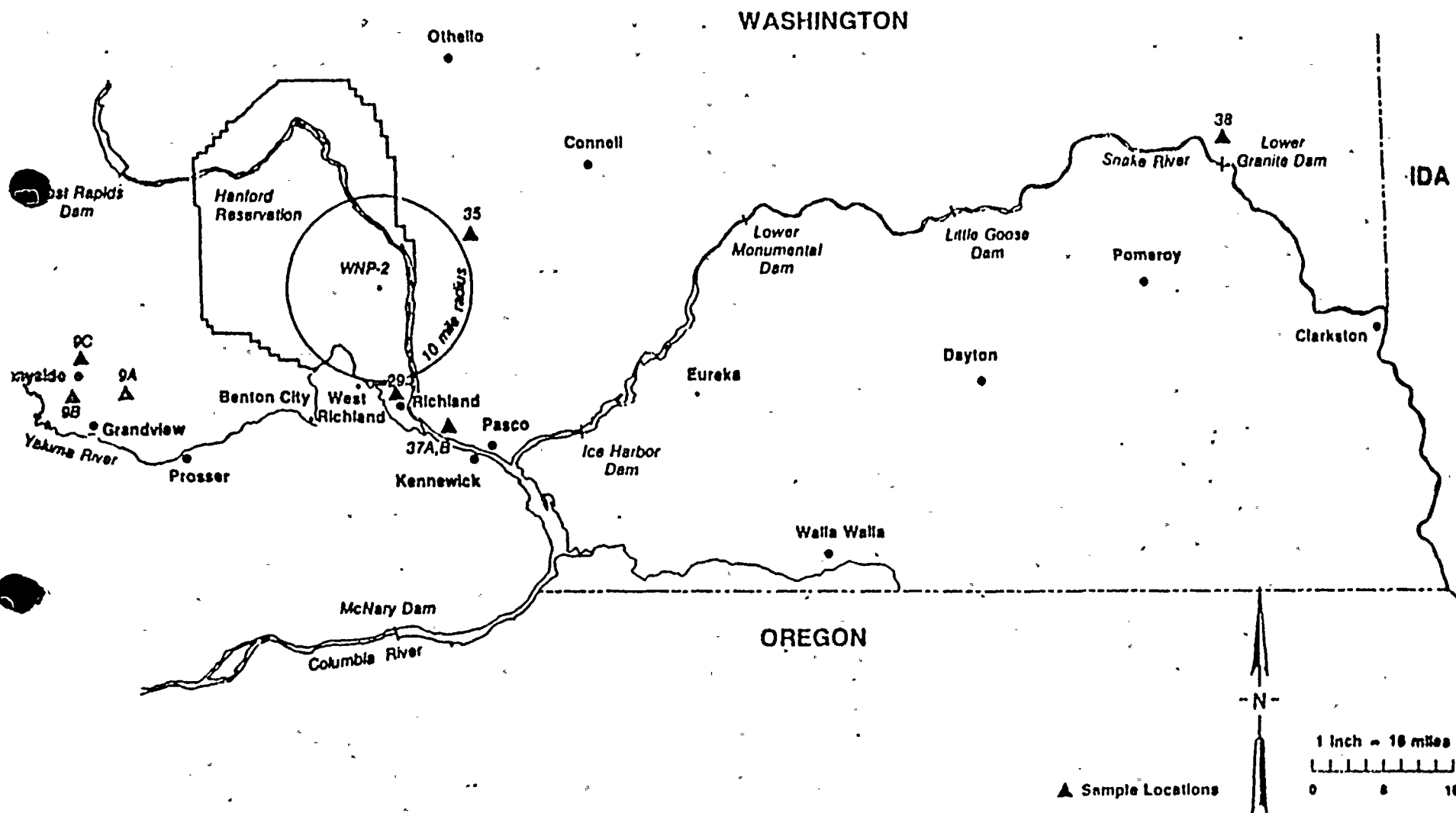


FIGURE 3.12- 1(b) Radiological Environmental Monitoring Sample Locations Outside of 10-Mile Radius



TABLE 3.12-2

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

## Reporting Levels

<u>Analysis</u>	<u>Water (pCi/l)</u>	<u>Airborne Particulate or Gases (pCi/m3)</u>	<u>Fish (pCi/Kg, wet)</u>	<u>Milk (pCi/l)</u>	<u>Food Products (pCi/Kg, wet)</u>
H-3	$2 \times 10^4$ <sup>(a)</sup>				
Mn-54	$1 \times 10^3$		$3 \times 10^4$		
Fe-59	$4 \times 10^2$		$1 \times 10^4$		
Co-58	$1 \times 10^3$		$3 \times 10^4$		
Co-60	$3 \times 10^2$		$1 \times 10^4$		
Zn-65	$3 \times 10^2$		$2 \times 10^4$		
Zr-Nb-95	$4 \times 10^2$ <sup>(b)</sup>				
I-131	2	0.9		3	$1 \times 10^2$
Cs-134	30	10	$1 \times 10^3$	60	$1 \times 10^3$
Cs-137	50	20	$2 \times 10^3$	70	$2 \times 10^3$
Ba-La-140	$2 \times 10^2$ <sup>(b)</sup>			$3 \times 10^2$ <sup>(b)</sup>	

(a) For drinking water. This is 40 CFR Part 141 value.

(b) Total for parent and daughter..

TABLE 4.12-1

MAXIMUM VALUES FOR THE LOWER LIMIT OF DETECTION (LLD)<sup>a</sup>

<u>Analysis</u>	<u>Water (pCi/l)</u>	<u>Airborne Particulate or Gases (pCi/m)</u>	<u>Fish (pCi/Kg, wet)</u>	<u>Milk (pCi/l)</u>	<u>Food Products (pCi/Kg, dry)</u>	<u>Sediment (pCi/Kg, dry)</u>
gross beta	4 <sup>b</sup>	1 x 10 <sup>-2</sup>				
<sup>3</sup> H	2000 <sup>b</sup>					
<sup>54</sup> Mn	15		130			
<sup>59</sup> Fe	30		260			
<sup>58</sup> , <sup>60</sup> Co	15		130			
<sup>65</sup> Zn	30		260			
<sup>95</sup> Zr	30					
<sup>95</sup> Nb	15					
<sup>131</sup> I	1 <sup>b</sup>	7 x 10 <sup>-2</sup>		1	60 <sup>c</sup>	
<sup>134</sup> Cs	15	5 x 10 <sup>-2</sup>	130	15	60	150
<sup>137</sup> Cs	18	6 x 10 <sup>-2</sup>	150	18	80	180
<sup>140</sup> Ba	60			60		
<sup>140</sup> La	15			15		

Note: This list does not mean that only these nuclides are to be detected and reported. Other peaks which are routinely measurable and identifiable shall also be identified and reported.

<sup>a</sup>The LLD is the smallest concentration of radioactive material in a sample that will yield a net count (above system background) that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal.

TABLE 4.12-1 (Continued)

For a particular measurement system (which may include radiochemical separation):

$$LLD = \frac{4.66 s_b}{E \cdot V \cdot 2.22 \cdot Y \cdot \exp(-\lambda t)}$$

where

LLD is the lower limit of detection as defined above (as pCi per unit mass or volume).

$s_b$  is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute).

E is the counting efficiency (as counts per disintegration).

V is the sample size (in units of mass or volume).

2.22 is the number of disintegrations per minute per picocurie

Y is the fractional radiochemical yield (when applicable)

$\lambda$  is the radioactive decay constant for the particular radionuclide

t is the elapsed time between sample collection and counting

The value of  $s_b$  used in the calculation of the LLD for a particular measurement system should be based on the actual observed variance of the background counting rate or of the counting rate of the blank samples (as appropriate) rather than on an unverified theoretically predicted variance. In calculating the LLD for a radionuclide determined by gamma-ray spectrometry, the background should include the typical contributions of other radionuclides normally present in the samples (e.g., potassium-40 in milk samples).

Analyses shall be performed in such a manner that the stated LLD's will be achieved under routine conditions. Occasionally background fluctuations, unavoidably small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may render these LLD's unachievable. In such cases, the contributing factors will be identified and described in the Annual Radiological Environmental Operating Report.

<sup>b</sup>LLD for drinking water.

<sup>c</sup>LLD for leafy vegetable.

3/4 12-12

Washington Nuclear - Unit 2

### 3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

#### 3/4.12.2 LAND USE CENSUS

##### LIMITING CONDITION FOR OPERATION

---

3.12.2 A land use census shall be conducted and shall identify the location of the nearest milk animal, the nearest residence and the nearest garden of greater than 500 square feet producing fresh leafy vegetables in each of the 16 meteorological sectors within a distance of five miles.

APPLICABILITY: At all times.

##### ACTION:

- a. With a land use census identifying a location(s) which yields a calculated dose or dose commitment greater than the values currently being calculated in Specification 4.11.2.3, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report which identifies the new location(s).
- b. With a land use census identifying a location(s) which yields a calculated dose or dose commitment (via the same exposure pathway) significantly greater than at a location from which samples are currently being obtained in accordance with Specification 3.12.1, in lieu of any other report required by Specification 6.9.1 prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report which identifies the new location. The new location, if available, shall be added to the radiological environmental monitoring program as soon as practicable. The sampling location, excluding the control station location, having the lowest calculated dose or dose commitment (via the same exposure pathway) may be deleted from this monitoring program after October 31 of the year in which this land use census was conducted.
- c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

##### SURVEILLANCE REQUIREMENTS

---

4.12.2.1 The land use census shall be conducted at least once per 12 months between the dates of June 1 and October 1, by door-to-door survey, aerial survey, or by consulting local agriculture authorities using that information which will provide the best results.

4.12.2.2 Reports - The results of the land use census shall be included in the Annual Radiological Environmental Operating Report.



### 3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

#### 3/4.12.3 INTER-LABORATORY COMPARISON PROGRAM

##### LIMITING CONDITION FOR OPERATION

3.12.3 The laboratories of the Supply System or its contractors which perform analyses shall participate in the Environmental Protection Agency's (EPA's) Environmental Radioactivity Laboratory Intercomparisons Studies (Crosscheck) Program or equivalent program which has been approved by the Commission. This participation shall include all of the determinations (sample medium-radionuclide combination) that are offered by EPA and that are also included in the monitoring program. The results of analysis of these crosscheck samples shall be included in the annual report.

APPLICABILITY: At all times.

##### ACTION:

- a. With analyses not being performed as required above, report the corrective actions taken to prevent a recurrence to the Commission in the Annual Radiological Environmental Operating Report.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

##### SURVEILLANCE REQUIREMENTS

4.12.3 A summary of the results obtained as part of the above required Inter-laboratory Comparison Program and in accordance with the ODCM shall be included in the Annual Radiological Environmental Operation Report. As an alternative, the Supply System laboratories or those of its contractors participating in the EPA crosscheck program may provide their EPA program code so that the NRC can review the EPA's participant data directly in lieu of submission in the annual report.

## INSTRUMENTATION

### BASES

---

#### 3/3.3.7.11 RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

The radioactive liquid effluent monitoring instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in liquid effluents during actual or potential releases of liquid effluents. The alarm/trip setpoints for these instruments shall be calculated in accordance with the procedures in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63 and 64 of Appendix A to 10 CFR Part 50.

#### 3/3.3.7.12 RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

The radioactive gaseous effluent monitoring instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous effluents during actual or potential releases of gaseous effluents. The alarm/trip setpoints for these instruments shall be calculated in accordance with the procedures in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. This instrumentation also includes provisions for monitoring (and controlling) the concentrations of potentially explosive gas mixtures in the waste gas holdup system. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63 and 64 of Appendix A to 10 CFR Part 50.

### 3/4.1.1 RADIOACTIVE EFFLUENTS

#### BASES

---

### 3/4.11.1 LIQUID EFFLUENTS

#### 3/4.11.1.1 CONCENTRATION

This specification is provided to ensure that the concentration of radioactive materials released in liquid waste effluents to UNRESTRICTED AREAS will be less than the concentration levels specified in 10 CFR Part 20, Appendix B, Table II, Column 2. This limitation provides additional assurance that the levels of radioactive materials in bodies of water in UNRESTRICTED AREAS will result in exposures within (1) the Section II.A design objectives of Appendix I, 10 CFR 50, to a MEMBER OF THE PUBLIC, and (2) the limits of 10 CFR 20.106(e) to the population. The concentration limits for dissolved or entrained noble gases were determined by converting their MPC's in air to an equivalent concentration in water using the methods described in International Commission on Radiological Protection (ICRP) Publication 2.

#### 3/4.11.1.2 DOSE

This specification is provided to implement the requirements of Sections II.A, III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Condition for Operation implements the guides set forth in Section II.A of Appendix I. The ACTION statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in liquid effluents will be kept "as low as is reasonably achievable." Also, for fresh water sites with drinking water supplies which can be potentially affected by plant operation, there is reasonable assurance that the operation of the facility will not result in radionuclide concentrations in the finished drinking water that are in excess of the requirements of 40 CFR 141. The dose calculation methodology and parameters in the ODCM implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data, such that the actual exposure of a MEMBER OF THE PUBLIC through appropriate pathways is unlikely to be substantially underestimated. The equations specified in the ODCM for calculating the doses due to the actual release rates of radioactive materials in liquid effluents are consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977 and Regulatory Guide 1.113, "Estimating Aquatic Dispersion of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I," April 1977.

This specification applies to the release of liquid effluents from each reactor at the site. For units with shared radwaste treatment systems, the liquid effluents from the shared system are proportioned among the units sharing that system.

### 3/4.11 RADIOACTIVE EFFLUENTS

#### BASES

#### 3/4.11.1.3 LIQUID WASTE TREATMENT SYSTEM

The OPERABILITY of the liquid radwaste treatment system ensures that this system will be available for use whenever liquid effluents require treatment prior to release to the environment. The requirement that the appropriate portions of this system be used when specified provides assurance that the releases of radioactive materials in liquid effluents will be kept "as low as is reasonably achievable". This specification implements the requirements of 10 CFR Part 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50 and the design objective given in Section II.D of Appendix I to 10 CFR Part 50. The specified limits governing the use of appropriate portions of the liquid radwaste treatment system were specified as a suitable fraction of the dose design objectives set forth in Section II.A of Appendix I, 10 CFR Part 50, for liquid effluents.

#### 3/4.11.1.4 LIQUID HOLDUP TANKS

Restricting the quantity of radioactive material contained in the specified tanks provides assurance that in the event of an uncontrolled release of the tanks' contents, the resulting concentrations would be less than the limits of 10 CFR Part 20, Appendix B, Table II, Column 2, at the nearest potable water supply and the nearest surface water supply in an unrestricted area.

### 3/4.11.2 GASEOUS EFFLUENTS

#### 3/4.11.2.1 DOSE RATE

This specification is provided to ensure that the dose at any time at and beyond the SITE BOUNDARY from gaseous effluents from all units on the site will be within the annual dose limits of 10 CFR Part 20. The annual dose limits are the dose associated with the concentrations of 10 CFR Part 20, Appendix B, Table II, Column 1. These limits provide reasonable assurance that radioactive material discharged in gaseous effluents will not result in the exposure of a MEMBER OF THE PUBLIC either within or outside the SITE BOUNDARY, to annual average concentrations exceeding the limits specified in Appendix B, Table II of 10 CFR Part 20 (10 CFR Part 20.106(b)(1)). For individuals who may at times be within the SITE BOUNDARY, the occupancy of the individual will usually be sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the SITE BOUNDARY. The specified release rate limits restrict, at all times, the corresponding gamma and beta dose rates above background to a MEMBER OF THE PUBLIC at or beyond the site boundary to less than or equal to 500 mrem/year to the total body or to less than or equal to 3000 mrem/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background to a child via the inhalation pathway to less than or equal to 1500 mrems/year.

This specification applies to the release of gaseous effluents from all reactors at the site.



2  
1

1

1

1

1

1

1

1

1

1

1

1

### 3/4.11 RADIOACTIVE EFFLUENTS

#### BASES

#### 3/4.11.2.2 DOSE - NOBLE GASES

This specification is provided to implement the requirements of Sections II.B, III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Conditions for Operation are the guides set forth in Section II.B of Appendix I. The ACTION statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in gaseous effluents will be kept "as low as is reasonably achievable." The Surveillance Requirements implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The dose calculations established in the ODCM for calculating the doses due to the actual release rates of radioactive noble gases in gaseous effluents are consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977 and Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water Cooled Reactors," Revision 1, July 1977. The ODCM equations provided for determining the air doses at the site boundary are based upon the historical average atmospheric conditions.

#### 3/4.11.2.3 DOSE - RADIOIODINES, RADIOACTIVE MATERIALS IN PARTICULATE FORM AND RADIONUCLIDES OTHER THAN NOBLE GASES

The specification is provided to implement the requirements of Sections II.C, III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Conditions for Operation are the guides set forth in Section II.C of Appendix I. The ACTION statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive materials in gaseous effluents will be kept "as low as is reasonably achievable". The ODCM calculational methods specified in the Surveillance Requirements implement the requirements in Section III.A of

### 3/4.11 RADIOACTIVE EFFLUENTS

#### BASES

#### 3/4.11.2.3 DOSE - RADIOIODINES, RADIOACTIVE MATERIALS IN PARTICULATE FORM AND RADIONUCLIDES OTHER THAN NOBLE GASES (Continued)

Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data, such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The ODCM calculational methods for calculating the doses due to the actual release rates of the subject materials are consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977 and Regulatory Guide 1.11, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," Revision 1, July 1977. These equations also provide for determining the actual doses based upon the historical average atmospheric conditions. The release rate specifications for radioiodines, radioactive materials in particulate form and radionuclides other than noble gases are dependent on the existing radionuclide pathways to man, in the unrestricted area. The pathways which were examined in the development of these calculations were: 1) individual inhalation of airborne radionuclides, 2) deposition of radionuclides onto green leafy vegetation with subsequent consumption by man, 3) deposition onto grassy areas where milk animals and meat producing animals graze with consumption of the milk and meat by man, and 4) deposition on the ground with subsequent exposure of man.

#### 3/4.11.2.4 AND 3.4.11.2.5 GASEOUS RADWASTE TREATMENT SYSTEM AND VENTILATION EXHAUST TREATMENT SYSTEM

The OPERABILITY of the GASEOUS RADWASTE TREATMENT SYSTEM and the VENTILATION EXHAUST TREATMENT SYSTEM ensures that the system will be available for use whenever gaseous effluents require treatment prior to release to the environment. The requirement that the appropriate portions of these systems be used, when specified, provides reasonable assurance that the releases of radioactive materials in gaseous effluents will be kept "as low as is reasonably achievable." This specification implements the requirements of 10 CFR Part 50.36a, General Design Criterion 60 of Appendix A to 10 CFR 50, and the design objectives given in Section II.D of Appendix I to 10 CFR Part 50. The specified limits governing the use of appropriate portions of the systems were specified as a suitable fraction of the dose design objectives set forth in Section II.B and II.C of Appendix I, 10 CFR Part 50, for gaseous effluents.

#### 3/4.11.2.6 EXPLOSIVE GAS MIXTURE

The specification is provided to ensure that concentration of potentially explosive gas mixtures contained in the off gas treatment system is maintained below the flammability limits of hydrogen and oxygen. Maintaining the concentration of hydrogen and oxygen below their flammability limits provides assurance that the releases of radioactive materials will be controlled in conformance with the requirements of General Design Criterion 60 of Appendix A to 10 CFR Part 50.

## 3/4.11 RADIOACTIVE EFFLUENTS

### BASES

---

#### 3/4.11.2.7 MAIN CONDENSER

Restricting the gross radioactivity rate of noble gases from the main condenser provides reasonable assurance that the total body exposure to an individual at the exclusion area boundary will not exceed a small fraction of the limits of 10 CFR Part 100 in the event this effluent is inadvertently discharged directly to the environment without treatment. This specification implements the requirements of General Design Criteria 60 and 64 of Appendix A to 10 CFR Part 50.

#### 3/4.11.2.8 VENTING OR PURGING

This specification provides reasonable assurance that releases from drywell purging operations will not exceed the annual dose limits of 10 CFR Part 20 for unrestricted areas.

#### 3/4.11.3 SOLID RADIOACTIVE WASTE

The OPERABILITY of the solid radwaste system ensures that the system will be available for use whenever solid radwastes require processing the packaging prior to being shipped offsite. This specification implements the requirements of 10 CFR Part 50.36a and General Design Criterion 60 of Appendix A to 10 CFR Part 50. The process parameters included in establishing the PROCESS CONTROL PROGRAM may include, but are not limited to waste type, waste pH, waste/liquid/chemical constituents, mixing and curing times.

#### 3/4.11.4 TOTAL DOSE

This specification is provided to meet the dose limitations of 40 CFR 190 that have been incorporated into 10 CFR 20 by 46 CFR 18525. The specification requires the preparation and submittal of a Special Report whenever the calculated doses from plant radioactive effluents exceed twice the design objective doses of Appendix I. For sites containing up to 4 reactors, it is highly unlikely that the resultant dose to a MEMBER OF THE PUBLIC will exceed the dose limits of 40 CFR 190 if the individual reactors remain within the reporting requirement level. The Special Report will describe a course of action that should result in the limitation of the annual dose to a member of the public to within the 40 CFR 190 limits. For the purposes of the Special Report, it may be assumed that the dose commitment to the MEMBER OF THE PUBLIC from other uranium fuel cycle sources is negligible, with the exception that dose contributions from other nuclear fuel cycle facilities at the same site or within a radius of 5 miles must be considered. If the dose to any MEMBER OF THE PUBLIC is estimated to exceed the requirements of 40 CFR 190, the Special Report with a request for a variance (provided the release conditions resulting in violation of 40 CFR 190 have not already been corrected), in accordance with the provisions of 40 CFR 190.11 and 10 CFR 20.405c, is considered to be a timely request and fulfills the requirements of 40 CFR 190 until NRC staff action is completed. An individual is not considered a MEMBER OF THE PUBLIC during and period in which he/she is engaged in carrying out any operation that is part of the nuclear fuel cycle.



## 3/4.12 RADIOACTIVE ENVIRONMENTAL MONITORING

### BASES

#### 3/4.12.1 MONITORING PROGRAM

The radiological monitoring program required by this specification provides measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides, which lead to the highest potential radiation exposures of individuals resulting from the station operation. This monitoring program thereby supplements the radiological effluent monitoring program by verifying that the measurable concentrations or radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and modeling of the environmental exposure pathways. The initially specified monitoring program will be effective for at least the first three years of commercial operation. Following this period, program changes may be initiated based on operational experience.

The detection capabilities required by Table 4.12-1 are state-of-the-art for routine environmental measurements in industrial laboratories. It should be recognized that the LLD is defined as an "a priori" (before the fact) limit representing the capability of a measurement system and not as "a posteriori" (after the fact) limit for a particular measurement. Analyses shall be performed in such a manner that the stated LLDs will be achieved under routine conditions. Occasionally background fluctuations, unavoidably small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may render these LLDs unachievable. In such cases, the contributing factors will be identified and described in the Annual Radiological Environmental Operation Report.

#### 3/4.12.2 LAND USE CENSUS

This specification is provided to ensure that changes in the use of unrestricted areas are identified and that modifications to the monitoring program are made if required by the results of this census. The best survey information from the door-to-door, aerial or consulting with local agricultural authorities shall be used. This census satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR Part 50. Restricting the census to gardens of greater than 500 square feet provides assurance that significant exposure pathways via leafy vegetables will be identified and monitored since a garden of this size is the minimum required to produce the quantity 26 kg/year of leafy vegetables assumed in Regulatory Guide 1.109 for consumption by a child. To determine this minimum garden size, the following assumptions were used, 1) that 20% of the garden was used for growing broad leaf vegetation (i.e., similar to lettuce and cabbage), and 2) a vegetation yield of 2 kg/square meter.

#### 3/4.12.3 INTER-LABORATORY COMPARISON PROGRAM

The requirement for participation in an Inter-laboratory Comparison Program is provided to ensure that independent checks on the precision and accuracy of the measurements of radioactive material in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring in order to demonstrate that the results are reasonably valid.

