ODCM Appendix A **Revision 7 Issued Date** 

### PALISADES NUCLEAR PLANT **OFFSITE DOSE CALCULATION MANUAL**

# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-09 (TAC NO 75060)

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#### I. INTRODUCTION

The NRC, through 10CFR50.36a, requires implementation of Technical Specifications on effluents from nuclear power plants. NRC Generic Letter 89-01, dated January 31, 1989, allowed relocation of the existing procedural requirements from the Technical Specifications (implemented in Amendment 85, November 9, 1984). The relocated procedural requirements related to gaseous and liquid effluents, total dose, environmental monitoring program, and associated procedural reporting requirements follow below. Programmatic controls are retained in the Administrative Controls section of the Technical Specification to satisfy the regulatory requirements of 10CFR50.36a. The Technical Specifications programmatic controls include requirements for the establishment, implementation, maintenance, and changes to the Offsite Dose Calculation Manual (ODCM) as well as record retention and reporting requirements.

#### II. DEFINITIONS

- A. <u>Channel Calibration</u> a Channel Calibration shall be the adjustment, as necessary, of the channel output such that it responds with the necessary range and accuracy to known values of the parameter which the channel monitors. The Channel Calibration shall encompass the entire channel including the sensor and alarm and/or trip functions, and shall include the Channel Function Test. The Channel Calibration may be performed by any series of sequential, overlapping or total channel steps such that the entire channel is calibrated.
- B. <u>Channel Check</u> a Channel Check shall be the qualitative assessment of channel behavior during operation by observation. This determination shall include, where possible, comparison of the channel indication and/or status with other indications and/or status derived from independent instrumentation channels measuring the same parameter.

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- C. <u>Channel Functional Test</u> a Channel Functional Test shall be:
  - 1. Analog channels the injection of a simulated signal into the channel as close to the sensor as practicable to verify operability including alarm and/or trip functions.
  - 2. Bistable channels the injection of a simulated signal into the sensor to verify operability including alarm and/or trip functions.
- D. <u>Source Check</u> a source check shall be the qualitative assessment of channel response when the channel sensor is exposed to a radioactive source.
- E. <u>Offsite Dose Calculation Manual</u> (per Plant Technical Specification) - the Offsite Dose Calculation Manual (ODCM) shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm/trip setpoints, and in the conduct of the Radiological Environmental Monitoring Program. The ODCM shall also contain; 1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by the Technical Specifications and, 2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Radioactive Effluent Release Reports required by the Technical Specifications.
- F. <u>Gaseous Radwaste Treatment System</u> any system designed and installed to reduce radioactive gaseous effluents by collecting primary coolant system off gases from the primary system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.
- G. <u>Members of the Public</u> all persons who are not occupationally associated with the Plant. This category does not include employees of the utility, its contractors or vendors. Also excluded from this category are persons who enter the site to service equipment or to make deliveries.

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H. <u>Process Control Program (PCP)</u> - shall contain the current formula, sampling, analyses, tests and determinations to be made to ensure that the processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure compliance with 10CFR Part 20, 10CFR Part 71 and Federal and State regulations and other requirements governing the disposal of the radioactive waste.

I. <u>Site Boundary</u> - that line beyond which the land is neither owned nor otherwise controlled by the licensee.

- J. <u>Unrestricted Area</u> any area at or beyond the Site Boundary access which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials or, any area within the Site Boundary used for residential quarters or for industrial, commercial, institutional, and/or recreational purposes.
- K. <u>Ventilation Exhaust Treatment System</u> any system designed and installed to reduce gaseous radioiodine or radioactive material in particulate form in effluents by passing ventilation or vent exhaust gases through charcoal absorbers and/or HEPA filters for the purpose of removing iodines or particulates from the gaseous exhaust stream prior to the release to the environment. Such a system is not considered to have any effect on noble gas effluents. Engineered Safety Feature (ESF) atmospheric cleanup systems are not considered to be ventilation exhaust treatment system components.

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### III. PROCEDURAL AND SURVEILLANCE REQUIREMENTS AND BASES

#### A. <u>Radioactive Gaseous Effluent Monitoring Instrumentation</u>

1. Requirement:

The radioactive gaseous effluent monitoring instrumentation channels shown in Table A-1 shall be operable with their alarm/trip setpoints set to ensure that the limits of requirement III.B.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined and adjusted in accordance with the methodology and parameters in the ODCM.

- 2. Action:
  - a. With a radicactive gaseous effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above requirement, without delay, suspend the release of radioactive gaseous effluents monitored by the affected channel or declare the channel inoperable or change the setpoint so it is acceptably conservative.
  - b. With less than the minimum number of radioactive gaseous effluent monitoring instrumentation channels operable, take the action shown in Table A-1. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner.
- 3. Surveillance Requirements:

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 A-2.

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4. Bases:

The radioactive gaseous effluent 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 and adjusted in accordance with the methodology and parameters in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10CFR 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 10CFR Part 50.

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	Tadioactive Gasedas Endent Monitoring Instrumentation					
	Instrument	Minimum Operable Channels	Applicability	Action		
1.	WASTE GAS HOLDUP SYSTEM					
	a. Noble Gas Activity Monitor (RIA 1113) Providing Alarm and Automatic Termination of Release	(1)	At All Times	1		
2.	CONDENSER EVACUATION SYSTEM (RIA 0631)					
	a. Noble Gas Activity Monitor	(1)	Above 210° F	3		
	b. Evacuation Flow Indicator (FI-0631 or FI-0632)	(1)***	Above 210°F	2		
3.	STACK GAS EFFLUENT SYSTEM					
	a. Noble Gas Activity Monitor (RIA 2326)	(1)	At All Times	3		
	b. Iodine/Particulate/Sampler/Monitor (RIA 2325)	(1)	At All Times	3		
	c. Sampler Flow Rate Monitor	(1)	At All Times	2		
	d. Hi Range Noble Gas (RIA 2327)*	(1)	Above 210° F	4		
4.	STEAM GENERATOR BLOWDOWN VENT SYSTEM	· · · · ·				
	a. Noble Gas Activity Monitor (RIA 2320)	(1)	Above 210° F	3		
5.	MAIN STEAM SAFETY AND DUMP VALVE DISCHARGE LINE					
	a. Gross Gamma Activity Monitor* (RIA 2323 and 2324)	1 per Main Steam Line	Above 325° F	4		
6.	ENGINEERED SAFEGUARDS PUMP ROOM VENTILATION HIGH RADIATION SYSTEM					
	a. Noble Gas Activity Monitor ** (RIA 1810 and 1811)	1 per Room	Above 210° F	5		

<u>Table A-1</u>					
Radioactive	Gaseous	Effluent	Monitorina	Instrumentation	

\* Setpoints for these instruments are exempted from III.B.1 limits, but are governed by Emergency Implementing Procedures or Operating procedures.

\*\* Setpoints for these instruments are exempted from III.B.1 limits, but are governed by Technical Specification Section 3.16 and Table 3.16. Minimum Operable Channels are defined by Technical Specification Table 3.17.3 (4).

<sup>+</sup> Documentation of operability not required.

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#### Table A-1 (Cont'd)

#### **TABLE NOTATION - ACTION STATEMENTS**

ACTION 1 -With the number of channels operable less than required by the Minimum Operable Channels requirements, the contents of the tank(s) may be released to the environment provided that prior to initiating the release: At least two independent samples of the tank's contents are analyzed, and a. b. At least two technically qualified members of the Facility staff independently verify the release rate calculations and discharge valve line up; Otherwise, suspend release of radioactive effluents via this pathway. ACTION 2 -With the number of channels operable less than required by the Minimum Operable Channels requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 24 hours. ACTION 3 -With the number of channels operable less than required by the Minimum Operable Channels requirement, effluent releases via this pathway may continue provided grab samples are taken at least once per 12 hours and these samples are analyzed for gross activity within 24 hours. ACTION 4 -With the number of operable channels less than required by the Minimum Operable Channels requirements, initiate the preplanned alternate method of monitoring the appropriate parameter(s), within 72 hours, and: Either restore the inoperable channel(s) to operable status within 7 days of а. the event, or b. Prepare and submit a Special Report to the NRC within 30 days following the event outlining the actions taken, the cause of the inoperability, and the plans and schedule for restoring the system to operable status. ACTION 5 -If either channel fails low or is otherwise inoperable, the ventilation dampers associated with that channel shall be closed immediately and action shall be taken to have the affected channel repaired. The dampers associated with the channel shall not be opened until the affected channel has been declared operable. (Reference **Technical Specification 3.17.3.4.**)



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<u>Table A-2</u> Radioactive Gaseous Effluent Monitoring Instrumentation Surveillance Requirements

					<u> </u>	
	Instrument	Channel Check	Source Check	Channel Calibration	Channel Functional Test	Modes in Which Surveillance Required
1.	WASTE GAS HOLDUP SYSTEM					
	a. Noble Gas Activity Monitor-Providing Alarm and	D(4)	P	R(3)	Q(1)(2)	*
	Automatic Termination of Release					1
2.	CONDENSER EVACUATION SYSTEM					
		1				
	a. Noble Gas Activity Monitor	D	М	R(3)	Q(2)	Above 210° F
	b. Evacuation Flow Indicator (FI-0632) or	D(4)	N/A	R	N/A	Above 210°F
	c. Evacuation Flow Indicator (FI-0631)	D(4)	N/A	N/A	N/A	Above 210°F
3.	STACK GAS EFFLUENT SYSTEM					
		1				
	a. Noble Gas Activity Monitor	D	м	R(3)	Q(2)	*
	b. Iodine Particulate Sampler/Monitor	w	M**	R(3)**	NA	*
	c. Sampler Flow Rate Monitor	) D	NA	R	NA	*
	d. Hi Range Noble Gas	D	M	R(3)	Q(2)	Above 210° F
4.	STEAM GENERATOR BLOWDOWN VENT SYSTEM					
	a. Noble Gas Activity Monitor	D	M	R(3)	Q(2)	Above 210° F
5.	MAIN STEAM SAFETY AND DUMP VALVE DISCHARGE LINE			-		
{						
1	a. Gross Gamma Activity Monitor	D	М	R(3)	Q(2)	Above 325° F
6.	ENGINEERED SAFEGUARDS PUMP ROOM VENTILATION HIGH					
	RADIATION SYSTEM					
l		l				
	a. Noble Gas Activity Monitor	S	М	R(3)	M(1)(2)	Above 210° F
	(Technical Specification Table 4,17,3 Item 4)	L				

\* At all times other than when the line is valved out and locked.

\*\* Sampler not applicable





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# Table A-2 (Cont'd) TABLE NOTATION

- (1) The Channel Functional Test shall also demonstrate that automatic isolation of this pathway occurs if instrument indicates measured levels above the alarm/trip setpoint.
- (2) The Channel Functional Test shall also demonstrate that control room alarm annunciation occurs if either of the following conditions exists.
  - a. Instrument indicates measured levels above the alarm setpoint (not applicable for Item 3.d, Hi Range Noble Gas).
  - b. Circuit failure.
- (3) a. The Channel Calibration shall be performed using one or more of the reference standards traceable to the National Institute of Standards and Technology or using standards that have been obtained from suppliers that participate in measurement assurance activities with NIST. These standards shall permit calibrating the system over its intended range of energy and measurement range.
  - b. For subsequent Channel Calibration, sources that have been related to the (1) calibration may be used.
- (4) Channel Check shall be made at least once per 24 hours on days on which continuous or batch releases are made.

### TABLE FREQUENCY NOTATION

- S At least once per 12 hours
- D At least once per 24 hours
- M At least once per 31 days
- P Prior to radioactive batch release
- Q At least once per 92 days
- R At least once per 18 months
- W At least once per week

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### B. <u>Gaseous Effluents Dose Rate</u>

1. Requirement:

The dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the Site Boundary (see Figure 2-1) shall be limited to the following:

- a. For noble gases: Less than or equal to 500mrems/yr to the total body and less than or equal to 3000 mrems/yr to the skin, and
- b. For lodine-131, for lodine-133, for tritium, and for all radionuclides in particulate form with half-lives greater than 8 days: Less than or equal to 1500 mrems/yr to any organ.
- 2. Action:

With the dose rate(s) averaged over a period of one hour exceeding the above limits, without delay, restore the release rate to within the above limit(s).

- 3. Surveillance Requirements:
  - a. The dose rate due to noble gases in gaseous effluents shall be determined to be within the limits of B.1.a in accordance with the methodology and parameters in the ODCM.
  - b. The dose rate due to lodine-131, lodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents shall be determined to be within the limits of B.1.b in accordance with the methodology and parameters in the ODCM by obtaining representative samples and performing analyses in accordance with the sampling and analysis program specified in Table B-1.

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#### 4.– Bases:

This 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 10 times the annual dose limits of 10CFR Part 20 to Unrestricted Areas. The annual dose limits are the doses associated with the concentrations of 10 times 10CFR Part 20, Appendix B, Table 2, Column 1. These restrictions provide reasonable assurance that radioactive material discharged in gaseous effluents will not result in the exposure of a Member of the Public in an Unrestricted Area, either within or outside the Site Boundary, to annual exposure greater than design objectives of 10CFR 50, Appendix I, Section II.B.1. For Members of the Public who may at times be within the Site Boundary, the occupancy of the Member of the Public will usually be sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the Site Boundary. Examples of calculations for such Members of the Public, with the appropriate occupancy factors, shall be given in the ODCM. The specified release rate limits restrict, at all times, the corresponding dose rate above background to a Member of the Public at or beyond the Site Boundary to less than or equal to 500 mrems/yr to the total body.

The required detection capabilities for radioactive materials in gaseous waste samples are tabulated in terms of the lower limits of detection (LLDs). Detailed discussion of the LLD and other detection limits can be found in HASL Procedures Manual, <u>HASL-300</u>, Currie, L A, "Limits for Qualitative Detection and Quantitative Determination - Application to Radiochemistry," <u>Anal Chem 40</u>, 586-93 (1968), and Hartwell, JK, "Detection Limits for Radioanalytical Counting Techniques," Atlantic Richfield Hanford Company Report <u>ARH-SA-215</u> (June 1975).

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- C. <u>Noble Gases Dose</u>
  - 1. Requirement:

The air dose due to noble gases released in gaseous effluents to areas at and beyond the Site Boundary (see Figure 2-1) shall be limited to the following:

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

With the calculated air dose from radioactive noble gases in gaseous effluents exceeding any of the above limits, prepare and submit to the NRC within 30 days a Special Report that 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.

3. Surveillance Requirements:

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

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

4. Bases:

This requirement is provided to implement the requirements of Sections II.B, III.A, and IV.A of Appendix I, 10CFR Part 50. The limiting Condition for Operation implements 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 to Unrestricted Areas 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 a Member of the Public through appropriate pathways is unlikely to be substantially underestimated. The dose calculation methodology and parameters 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 10CFR 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 and beyond the Site Boundary are based upon the historical average atmospheric conditions.

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- D. <u>I-131, I-133, Tritium, and Particulates</u>
  - 1. Requirement:

The dose to a Member of the Public from Iodine-131, Iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released, from each reactor unit, to areas at and beyond the Site Boundary (see Figure 2-1) shall be limited to the following:

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

With the calculated dose from the release of lodine-131, lodine-133, tritium, and radionuclides in particulate form with half-lives greater than 8 days, in gaseous effluents exceeding any of the above limits, prepare and submit to the NRC within 30 days a Special Report that identifies the cause(s) for exceeding the limit and define(s) 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.

3. Surveillance Requirements:

Cumulative dose contributions for the current calendar quarter and current calendar year for lodine-131, lodine-133, tritium and radionuclides in particulate form with half-lives greater than 8 days shall be determined in accordance with the methodology and parameters in the ODCM at least once per 31 days.

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#### 4.- Bases:

This requirement is provided to implement the requirements of Sections II.C, III.A, and IV.A of Appendix I, 10CFR Part 50. The requirements 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 to Unrestricted Areas will be kept "as low as is reasonably achievable." The ODCM calculational methods specified in the Surveillance Requirements implement the requirements in Section II.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 ODCM calculational methodology and parameters 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 10CFR 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. These equations also provide for determining the actual doses based upon the historical average atmospheric conditions. The release rate requirements for lodine-131, lodine-133, tritium, and radionuclides in particulate form with half-lives greater than 8 days are dependent upon the existing radionuclide pathways to man, in areas at and beyond the Site Boundary. The pathways that 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.



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 Table B-1

 Radioactive Gaseous Waste Sampling and Analysis Program

	Gaseous Release Type	Sampling Frequency	Minimum Analysis Freguency	Type of Activity Analysis	Lower Limit Detection (LLD) <sup>a</sup> ( <i>u</i> Ci/ml)
Α.	Waste Gas Storage Tank	P Foob Topk	P		
		Grab Sample	Each Tank	Principal Gamma Emitters <sup>b</sup>	1 x 10 <sup>-4</sup>
В.	Containment PURGE	Р			
		Each PURGE	P		
		Grab Sample	Each PURGE	Principal Gamma Emitters <sup>b</sup>	1 x 10 <sup>-4</sup>
C.	Stack Gas Effluent		W <sup>d,e</sup>		
		Continuous <sup>c</sup>	Charcoal Sample	I-131, I-133	1 x 10 <sup>-12</sup>
			W <sup>d,e</sup>		
		Continuous <sup>c.</sup>	Particulate Sample	Principal Gamma Emitters <sup>b</sup> (I-131, Others)	1 x 10 <sup>-11</sup>
		Continuous <sup>c</sup>	Q Composite Particulate Sample	Sr-89, Sr-90 and Gross Alpha	1 x 10 <sup>-11</sup>
		Continuous <sup>c</sup>	Noble Gas Monitor	Noble Gases Gross Beta or Gamma	1E-06

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# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

#### Table B-1 (Cont'd)

#### TABLE NOTATION

<sup>a</sup>The LLD is defined, in Table E-3, note C.

<sup>b</sup>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 considered. Other gamma peaks that are identifiable, together with those of the above nuclides, shall also be analyzed and reported in the Radioactive Effluent Release Report.

\*Ten times the LLD because of low gamma yields.

<sup>c</sup>The ratio of the sample flow rate to the sample stream flow rate shall be known for the time period covered by each dose or dose rate calculation made in accordance with requirements III.B.1, III.C.1, and III.D.1.

<sup>d</sup>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.

<sup>e</sup>With channels operable on iodine monitor RIA 2325 less than required per III.A.1, sampling shall also be performed at least once per 24 hours for at least 7 days following each shutdown, start-up or Thermal Power change exceeding 15 percent of Rated Thermal Power in one hour and analyses shall be 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. This requirement does not apply if, 1) analysis shows that the Dose Equivalent I-131 concentration in the primary coolant has not increased more than a factor of 3, and 2) the noble gas monitor shows that effluent activity has not increased more than a factor of 3.

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

- E. <u>Gaseous Waste Treatment System</u>
  - 1. Requirement:

When gaseous waste exceeds a Xe-133 concentration of 1E-05  $\mu$ Ci/cc, the Waste Gas Decay Tank System shall be used to reduce radioactive gaseous effluents by holding gaseous waste collected by the system for a minimum of 15 days up to 60 days.

- 2. Action:
  - a. If a waste gas decay tank is required to be released with less than 60 days holdup time, the system waste gas tank contents shall be evaluated and the waste gas decay tank with the lowest Xe-133 content shall be released.
  - b. Gaseous waste may be discharged directly from the waste gas surge tank through a high-efficiency filter or from a waste gas decay tank with less than 15 days of holdup directly to the stack for a period not to exceed 7 days if the holdup system equipment is not available and the release rates meet requirements III.B, C, and D.
- 3. Surveillance Requirements:

Not Applicable.

4. Bases:

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" by meeting the design objectives given in Section II.D of Appendix I to 10CFR50.



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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

It is expected that releases of radioactive materials in effluents shall be kept at small fractions of the limits specified in 20.1302 of 10CFR20. At the same time the licensee is permitted the flexibility of operation, compatible with considerations of health and safety, to assure that the public is provided a dependable source of power even under unusual operating conditions which may temporarily result in releases higher than such small fractions, but still within the limits specified in III.B, C, and D.

#### F. Radioactive Liquid Effluent Monitoring Instrumentation

1. Requirement:

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

- 2. Action:
  - a. With a radioactive liquid effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above specification, without delay suspend the release of radioactive liquid effluents monitored by the affected channel or declare the channel inoperable, or change the setpoint so it is acceptably conservative.
  - b.

With less than the minimum number of radioactive liquid effluent monitoring instrumentation channels Operable, take the Action shown in Table C-1. Exert best efforts to return the instruments to Operable status within 30 days and, if unsuccessful, explain in the next Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner.

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## TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

3.– Surveillance Requirements:

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 C-2.

4. Bases:

The radioactive liquid effluent 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 and adjusted in accordance with the methodology and parameters in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10CFR 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 10CFR Part 50.

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# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

### Table C-1

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### **RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION**

	Instrument	Minimum Operable Channels	Action
1.	GROSS RADIOACTIVITY MONITORS PROVIDING ALARM AND AUTOMATIC TERMINATION OF RELEASE		
	a. Liquid Radwaste Effluent Line (RIA 1049)	(1)	1
	b. Steam Generator Blowdown Effluent Line (RIA 0707)	(1)	2
2.	GROSS BETA OR GAMMA RADIOACTIVE MONITORS PROVIDING ALARM BUT NOT PROVIDING AUTOMATIC TERMINATION OF RELEASE		
	a. Service Water System Effluent Line (RIA 0833)	(1)	3
	b. Turbine Building (Floor Drains) Sumps Effluent Line (RIA 5211)	(1)	3
3.	FLOW RATE MEASUREMENT DEVICES		
<u> </u>	a. Liquid Radwaste Effluent Line (FIC 1051 or 1050)	(1)	4
4.	<b>CONTINUOUS COMPOSITE SAMPLERS</b> (Alarm/Trip Setpoints are not applicable)		
	a. Turbine Building Sumps Effluent Line	(1)	3
	b. Service Water System Effluent	(1)	3
	c. Steam Generator Blowdown Effluent	(1)	3

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#### Table C-1 (Cont'd)

#### TABLE NOTATION

- ACTION 1 With the number of channels operable less than required by the Minimum Operable Channels requirement, effluent releases may continue provided that prior to initiating a release:
  - a. At least two independent samples are analyzed in accordance with requirements and
  - 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.

- CTION 2 With the number of channels operable less than required by the Minimum Operable Channels requirement, effluent releases via this pathway may continue provided grab samples are analyzed for radioactivity at a lower limit of detection as specified in Table D-1 for principle gamma emitters and I-131 at least once per 12 hours.
  - ACTION 3 With the number of channels operable less than required by the Minimum Operable Channels requirement, effluent releases via this pathway may continue provided that, at least once per 24 hours, grab samples are collected and analyzed for radioactivity at a lower limit of detection as specified in Table D-1 for principle gamma emitters and I-131.
  - ACTION 4 With the number of channels operable less than required by the Minimum Operable Channels requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours during actual releases. Pump performance curves or tank levels may be used to estimate flow.

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### Table C-2

### **RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS**

		Instrument	Channel Check	Source Check	Channel Calibration	Channel Functional Test
1.	GF AL	OSS RADIOACTIVITY MONITORS PROVIDING ALARM AND				
	a.	Liquid Radwaste Effluent Line (RIA 1049)	Р	Р	R(3)	Q(1)(2)
	b.	Steam Generator Blowdown Effluent Line (RIA 0707)	D	М	R(3)	Q(1)(2)
2.	GF AL	OSS GAMMA OR GAMMA RADIOACTIVITY MONITORS PROVIDING ARM BUT NOT PROVIDING AUTOMATIC TERMINATION OF RELEASE				
	a.	Service Water System Effluent Line (RIA 0833)	D	М	R(3)	Q(2)
	b.	Turbine Building (Floor Drains) Sumps Effluent Line (RIA 5211)	D	м	R(3)	Q(2)
3.	FL	OW RATE MEASUREMENT DEVICES (5)				
	a.	Liquid Radwaste Effluent Line (FIC 1051 or 1050)	D(4)	NA	R	NA
4.	TU	RBINE SUMP EFFLUENT COMPOSITER	D(4)	NA	NA .	NA
5.	SE	RVICE WATER SYSTEM EFFLUENT COMPOSITE SAMPLER	D(4)	NA	NA	NA
6.	ST	EAM GENERATOR BLOWDOWN EFFLUENT COMPOSITER	D(4)	NA	NA	NA



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### Table C-2 (Cont'd)

### **TABLE NOTATION**

- (1) The Channel Functional Test shall also demonstrate that automatic isolation of this pathway occurs if instrument indicates measured levels above the alarm/trip setpoint.
- (2) The Channel Functional Test shall also demonstrate that Control Room alarm annunciation occurs if either of the following conditions exists:
  - a. Instrument indicates measured levels above the alarm setpoint.
  - b. Circuit failure.
- (3) a. The Channel Calibration shall be performed using one or more of the reference standards traceable to the National Institute of Standards and Technology or using standards that have been obtained from suppliers that participate in measurement assurance activities with NIST. These standards shall permit calibrating the system over its intended range of energy and measurement range.
  - b. For subsequent Channel Calibration, sources that have been related to the (a) calibration may be used.
- (4) Channel Check shall consist of verifying indication of flow during periods of releases. Channel Check shall be made at least once per 24 hours on days on which continuous or batch releases are made.
- (5) Turbine Sump Discharge Flow Meter FQI-5210 was calibrated at factory and doesn't require recalibration.

### TABLE FREQUENCY NOTATION

- D At least once per 24 hours
- M At least once per 31 days
- P Prior to radioactive batch release
- Q At least once per 92 days
- R At least once per 18 months
  - W At least once per week



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# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

- G. Liquid Effluents Concentration
  - 1. Requirement:

The concentration of radioactive material released in liquid effluents to Unrestricted Areas shall be limited to 10 times the concentrations specified in 10CFR Part 20, Appendix B, Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to  $2 \times 10^{-4}$  microcuries/ml total activity.

2. Action:

With the concentration of radioactive material released in liquid effluents to Unrestricted Areas exceeding the above limits, without delay, restore the concentration to within the above limits.

- 3. Surveillance Requirements:
  - a. Radioactive liquid wastes shall be sampled and analyzed according to the sampling and analysis program of Table D-1.
  - b. The results of the radioactivity analysis shall be used in accordance with the methodology and parameters in the ODCM to assure that the concentrations at the point of release are maintained within the limits of G.1 above.

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

4.<sup>--</sup> Bases:

This requirement is provided to ensure that the concentration of radioactive materials released in liquid waste effluents to Unrestricted Areas will be less than 10 times the concentration levels specified in 10CFR Part 20, Appendix B, Table 2, 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 the Section II.A design objectives of Appendix I, 10CFR Part 50, to a Member of the Public. The concentration limit for dissolved or entrained noble gases is based upon the assumption that Xe-135 is the controlling radioisotope and 10 times the effluent concentration in air (submersion) was converted to an equivalent concentration in water using the methods described in International Commission on Radiological Protection (ICRP) Publication 2.

The required detection capabilities for radioactive materials in liquid waste samples are tabulated in terms of the lower limits of detection (LLDs). Detailed discussion of the LLD and other detection limits can be found in HASL Procedures Manual, <u>HASL-300</u>, Currie, LA, "Limits for Qualitative Detection and Quantitative Determination - Application to Radiochemistry," <u>Anal Chem 40</u>, 586-93 (1968), and Hartwell, JK, "Detection Limits for Radioanalytical Counting Techniques," Atlantic Richfield Hanford Company Report <u>ARH-SA-215</u> (June 1975).

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# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

Table D-1 Radioactive Liquid Waste Sampling and Analysis Program

Liquid Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit Detection (LLD) <sup>a</sup> (µCi/ml)
A. Batch Waste Release Tanks <sup>b</sup>	P Each Batch	P Each Batch	Principal Gamma Emitters <sup>c</sup> I-131	5 x 10 <sup>-7</sup> 1 x 10 <sup>-6</sup>
	P One Batch/M	М	Dissolved and Entrained Gases (Gamma Emitters)	1 x 10 <sup>-5</sup>
	P Each Batch	M Composite <sup>d</sup>	H-3 Gross Alpha	1 x 10 <sup>-5</sup> 1 x 10-7 1 x 10
	P Each Batch	Q Composite <sup>d</sup>	Sr-89, Sr-90	5 x 10 <sup>-8</sup>
B. Continuous Releases <sup>e</sup> (Turbine Sump, Steam Generator	Continuous <sup>f</sup>	W f Composite	Principal Gamma Emitters <sup>c</sup> I-131	5 x 10 <sup>-7</sup> 1 x 10 <sup>-6</sup>
Blowdown, and Service Water)	M Grab Sample	М	Dissolved and Entrained Gases (Gamma Emitters)	1 x 10 <sup>-5</sup>
	Continuous	M Composite <sup>f</sup>	H-3 Gross Alpha	1 x 10 <sup>-5</sup> 1 x 10 <sup>-7</sup> 1 x 10
	Continuous	Q Composite	Sr-89, Sr-90	5 x 10 <sup>-8</sup>

### **Frequency Notation**

- **P** Prior to batch release
- M Calendar month
- **Q** Calendar quarter
- W Calendar week

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#### Table D-1 (Cont'd)

#### TABLE NOTATION

<sup>a</sup>The LLD is defined, in Table E-3, Note C.

<sup>b</sup>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.

<sup>c</sup> 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 Radioactive Effluent Release Report.

\*LLD - 5E-06 because of low gamma yields.

<sup>d</sup>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.

<sup>e</sup>A continuous release is the discharge of liquid wastes of a nondiscrete volume; eg, from a volume of a system that has an input flow during the continuous release.

<sup>f</sup>To be representative of the quantities and concentrations of radioactive materials in liquid effluents, samples shall be collected in a series of aliquots of constant volume collected at regular time intervals and combined to form a single sample. Prior to analyses, all samples taken for the composite shall be thoroughly mixed in order for the composite sample to be representative of the effluent release.

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

#### H. Liquid Effluent Dose

1. Requirement:

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 shall be limited:

- b. During any calendar year to less than or equal to
  3 mrems to the total body and to less than or equal to
  10 mrems to any organ.
- 2. Action:

With the calculated dose from the release of radioactive materials in liquid effluents exceeding any of the above limits, prepare and submit to the NRC within 30 days a Special Report that 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 results of radiological analyses of the drinking water source.

3. Surveillance Requirements:

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 every 31 days.

a. During any calendar quarter to less than or equal to
 1.5 mrems to the total body and to less than or equal
 to 5 mrems to any organ, and

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

#### 4. \_\_ Bases:

This requirement is provided to implement the requirements of Sections II.A, III.A, and IV.A of Appendix I, 10CFR 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 to Unrestricted Areas will be kept "as low as is reasonably achievable." Also, for freshwater sites with drinking water supplies that can be potentially affected by Plant operations, 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 40CFR Part 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 10CFR 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.

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

#### I. <u>Total Dose</u>

1. Requirement:

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

2. Action:

With the calculated doses from the release of radioactive materials in liquid or gaseous effluents exceeding twice the limits of III.C.1.a, III.C.1.b, III.D.1.a, III.D.1.b, III.H.1.a, or III.H.1.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 III.I.1 have been exceeded. If such is the case, prepare and submit to the NRC within 30 days a Special Report that defines the corrective action to be taken to reduce subsequent releases to prevent recurrence of exceeding the above limits and includes the schedule for achieving conformance with the above limits. This Special Report, as defined in 10CFR Part 20.2203, 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 40CFR Part 190 has not already been corrected, the Special Report shall include a request for a variance in accordance with the provisions of 40CFR Part 190. Submittal of the report is considered a timely request and a variance is granted until staff action on the request is complete.

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

- 3. Surveillance Requirements:
  - a. Cumulative dose contributions from liquid and gaseous effluents shall be determined in accordance with III.C.1, III.D.1 and III.H.1 and in accordance with the methodology and parameters in the ODCM.
  - b. Cumulative dose contributions from direct radiation from the reactor units and from radwaste storage tanks shall be determined in accordance with the methodology and parameters in the ODCM. This requirement is applicable only under conditions set forth in Action I.2 above.

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

#### 4.- Bases:

This requirement is provided to meet the dose limitations of 40CFR Part 190 that have been incorporated into 10CFR Part 20 by 46 FR 18525. It also requires the preparation and submittal of a Special Report whenever the calculated doses from Plant generated radioactive effluents and direct radiation exceed 25 mrems to the total body or any organ, except for thyroid, which shall be limited to less than or equal to 75 mrems. 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 40CFR Part 190 if the individual reactors remain within twice the dose design objectives of Appendix I and if direct radiation doses from the reactor units and outside storage tanks are kept small. 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 40CFR Part 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 8 km must be considered. If the dose to any Member of the Public is estimated to exceed the requirements of 40CFR Part 190, the Special Report with a request for a variance (provided the release conditions resulting in violation of 40CFR Part 190 have not already been corrected), in accordance with the provisions of 40CFR Part 190.11 and 10CFR Part 20.2203, is considered to be a timely request and fulfills the requirements of 40CFR Part 190 until NRC staff action is completed. The variance only relates to the limits of 40CFR Part 190 and does not apply in any way to the other requirements for dose limitation of 10CFR Part 20. An individual is not considered a Member of the Public during any period in which he/she is engaged in carrying out any operation that is part of the nuclear fuel cycle.

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

- J. Radiological Environmental Monitoring
  - 1. Requirement:

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

- 2. Action:
  - a. With the radiological environmental monitoring program not being conducted as specified in Table E-1, prepare and submit to the NRC, in the Annual Radiological Environmental Operating Report a description of the reasons for not conducting the program as required and the plans for preventing a recurrence.
  - b. With the level of radioactivity as the result of Plant effluents in an environmental sampling medium at a specified location exceeding the reporting levels of Table E-2 when averaged over any calendar quarter, prepare and submit to the NRC within 30 days a Special Report that identifies the cause(s) for exceeding the limit(s) and defines the corrective actions to be taken to reduce radioactive effluents. When more than one of the radionuclides in Table E-2 are detected in the sampling medium, this report shall be submitted if:

<u>Concentration (1)</u> + <u>Concentration (2)</u> + ....  $\geq$  1.0 Reporting Level (1) Reporting Level (2)

When radionuclides other than those in Table E-2 are detected and are the result of Plant effluents, this report shall be submitted if the potential annual dose to a Member of the Public is equal to or greater than the calendar year limits of III.C.1, III.D.1, and III.H.1. 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.

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## TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

- c. With milk or fresh leafy vegetable samples unavailable from one or more of the sample locations required by Table E-1, identify locations for obtaining replacement samples and add them to the radiological environmental monitoring program within 30 days. The specific locations from which samples were unavailable may then be deleted from the monitoring program. Identify the cause of the unavailability of samples and identify the new location(s) for obtaining replacement samples in the next Annual Radiological Environmental Report.
- 3. Surveillance Requirements:
  - a. The radiological environmental monitoring samples shall be collected pursuant to Table E-1 and shall be analyzed pursuant to the requirements of Table E-1 and the detection capabilities required by Table E-3.
  - A land use census shall be conducted and shall identify within a distance of 8 km (5 miles) the location in each of the 9 overland meteorological sectors of the nearest milk animal, the nearest residence and the nearest garden of greater than 50 m<sup>2</sup> (500 ft<sup>2</sup>) producing broad leaf vegetation. Broad leaf vegetation sampling of at least three different kinds of vegetation may be performed at the site boundary in each of two different direction sectors with the highest predicted D/Qs in lieu of the garden census. For broad leaf vegetation sampling, Table E-1, item 4c, shall be followed, including analysis of control samples.
  - c. The land use census shall be conducted during the growing season at least once per 12 months using that information that will provide the best results, such as by a door-to-door survey, aerial survey, or by consulting local agriculture authorities. The results of the land use census shall be included in the Annual Radiological Environmental Operating Report and shall be included in a revision of the ODCM for use in the following calendar year.

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## TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTEP 99-01 (TAC NO 75060)

- d. Analyses shall be performed on radioactive materials supplied as part of an Interlaboratory Comparison Program that has been approved by the NRC.
- e. A summary of the results obtained as part of the above required Interlaboratory Comparison Program shall be included in the Annual Radiological Environmental Operating Report.
- f. The environmental air samplers shall be operationally checked monthly and airflow verified annually.
- 4. Bases:

#### a. Monitoring Program

The radiological environmental monitoring program provides representative measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides that lead to the highest potential radiation exposures of Members of the Public resulting from the station operation. This monitoring program implements Section IV.B.2 of Appendix I to 10CFR Part 50 and thereby supplements the radiological effluent monitoring program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and the modeling of the environmental exposure pathways. Guidance for this monitoring program is provided by the Radiological Assessment Branch Technical Position on Environmental Monitoring. 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 required detection capabilities for environmental sample analyses are tabulated in terms of the lower limits of detection (LLDs). The LLDs required by Table E-3 are considered optimum for routine environmental measurements in industrial laboratories.

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- Detailed discussion of the LLD, and other detection limits, can be found in HASL Procedures Manual, <u>HASL-300</u>, Currie, LA, "Limits for Qualitative Detection and Quantitative Determination - Application to Radiochemistry," <u>Anal Chem 40</u>, 586-92 (1968), and Hartwell, JK, "Detection Limits for Radioanalytical Counting Techniques," Atlantic Richfield Hanford Company Report <u>ARH-SA-15</u> (June 1975).
- b. Land Use Census:

This requirement is provided to ensure that changes in the use of areas at and beyond the site boundary are identified and that modifications to the radiological environmental monitoring program are made if required by results of this census. The best information from the door-to-door survey, from aerial survey or from consulting with local agricultural authorities shall be used. This census satisfies the requirements of Section IV.B.3 of Appendix I to 10CFR Part 50. Restricting the census to gardens of greater than 40 m<sup>-</sup> 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 (16 kg/yr) of leafy vegetables assumed in Regulatory Guide 1.109 for consumption by a child.

To determine this minimum garden size, the following assumptions were made: (1) 20% of the garden was used for growing broad leaf vegetation (ie, similar to lettuce and cabbage), and (2) a vegetation yield of  $2 \text{ kg/m}^2$ .

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# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

c. Interlaboratory Comparison Program:

The requirement for participation in an approved Interlaboratory 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 valid for the purposes of Section IV.B.2 of Appendix I to 10CFR Part 50.





# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

### Table E-1

### Radiological Environmental Monitoring Program

Collection Frequency	of Analysis
Quarteriy	Gamma dose quarterly
	Collection Frequency Quarterly



# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

Exposure Pathway and/or Sample		Number of Representative Samples and Sample Locations <sup>a</sup>	Sampling and Collection Frequency	Type of Frequency of Analysis	
2.	AIRBORNE				
	Radioiodine and Particulates	<ul> <li>Samples from 5 locations.</li> <li>3 samples from within 6 km of the Site Boundary in different sectors (2.4 km-SSW, 5.6 km-ESE, and 1.6 km-N).</li> <li>1 sample from the vicinity of a community having the highest calculated annual average ground level D/Q (Covert-5.6 km-SE).</li> <li>1 sample from a control location in the least prevalent wind direction <sup>C</sup> (Grand Rapids 89 km-NNE).</li> </ul>	Continuous sample operation with sample collection weekly or more frequently if required by dust loading.	Radioiodine Canister: I-131 analysis weekly for each filter change. <u>Particulate Sampler:</u> Gross beta radioactivity analysis following filter change Gamma isotopic analysis if gross beta > 1.0 pCi/m <sup>2</sup> .	
3.	WATERBORNE				
	a. Lake (surface)	Plant lake water inlet.	Composite sample over 1-month period .	Gross beta (>10 pCi/l requires gamma) and tritium monthly.	
	b. Well (drinking)	Samples from Plant, State Park, and Covert Township Park wells.	Monthly - grab sample.	Gross beta (>10 pCi/l requires gamma) and tritium monthly.	
	c. Lake (drinking)	1 sample of South Haven drinking water supply.	Composite sample over 1-month period .	Gross beta (>10 pCi/l requires gamma) and tritium monthly.	
	d. Sediment from shoreline	1 sample from between north boundary and Van Buren State Park beach.	Semiannually	Gamma isotopic analysis <sup>e</sup> semiannually.	

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# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

Exposure Pathway and/or Sample		osure Pathway nd/or Sample	Number of Representative Samples and Sample Locations <sup>a</sup>	Sampling and Collection Frequency	Type of Frequency of Analysis	
4.	INGESTION					
	<b>a.</b>	Milk	Samples from milking animals in 3 locations between 5-13 km distance. 1 sample from milking animals at a control	Monthly	Gamma isotopic <sup>e</sup> and I-131 analysis monthly.	
			location, 15-30 km distance.			
	b. Fish and Invertebrates		Sample 2 species of commercially and/or recreationally important species in vicinity of Plant discharge area. 1 sample of same species in areas not influence by Plant discharge.	Sample in season or semiannually if they are not seasonal.	Gamma isotopic analysis <sup>e</sup> on edible portions.	
			1 sample each of two principal fruit crops (blueberries and apples).	At time of harvest <sup>9</sup> .	Gamma isotopic <sup>e</sup> and I-131 analysis.	
			Samples of 3 different kinds of broad leaf vegetation grown nearest each of two different offsite locations of highest predicted annual average ground level D/Q if milk sample is not performed. (SE or SSE sectors near site).	Monthly when available.	Gamma isotopic <sup>e</sup> and I-131 analysis.	
			1 sample of each of the similar broad leaf vegetation grown 15-30 km distance in the least prevalent wind direction if milk sampling is not performed. (SSW or S sectors).	Monthly when available.	Gamma Isotopic <sup>e</sup> and I-131 analysis.	



## TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

### Table E-1 (Cont'd) Table Notation

<sup>a</sup>Deviations are permitted from the required sampling schedule if specimens are unobtainable due to hazardous conditions, seasonal unavailability, malfunction of automatic sampling equipment and other legitimate reasons. If specimens are unobtainable due to sampling equipment malfunction, every effort shall be made to complete corrective action prior to the end of the next sampling period. All deviations from the sampling schedule shall be documented in the Annual Radiological Environmental Operating Report. It is recognized that, at times, it may not be possible or practicable to continue to obtain samples of the media of choice at the most desired location or time. In these instances, suitable alternative media and locations may be chosen for the particular pathway in question and appropriate substitutions made within 30 days in the radiological environmental monitoring program.

<sup>b</sup>One or more instruments, such as a pressurized ion chamber, for measuring and recording dose rate continuously may be used in place, or in addition to, integrating dosimeters. For the purposes of this table, a thermoluminescent dosimeter (TLD) is considered to be one phosphor; two or more phosphors or phosphor readout zones in a packet are considered as two or more dosimeters.

<sup>c</sup>The purpose of this sample is to obtain background information. If it is not practical to establish control locations in accordance with the distance and wind direction criteria, other sites that provide valid background data may be substituted.

<sup>d</sup>Airborne particulate sample filters shall be analyzed for gross beta radioactivity 24 hours or more after sampling to allow for radon and thoron daughter decay. If gross beta activity in air particulate samples is greater than ten times the yearly mean of control samples, gamma isotopic analysis shall be performed on the individual samples.

Gamma isotopic analysis means the identification and quantification of gamma-emitting radionuclides that may be attributable to the effluents from the facility.

<sup>f</sup>A composite sample is one in which the quantity (aliquot) of liquid samples is proportional to the quantity of liquid discharged and in which the method of sampling employed results in a specimen that is representative of the liquid released (continuous composites or daily grab composites which meet this criteria are acceptable).

<sup>9</sup>If harvest occurs more than once a year, sampling shall be performed during each discrete harvest.





# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

 Table E-2

 Reporting Levels for Radioactivity Concentrations in Environmental Samples

**Reporting Levels** 

Analysis Water (pCi/l)		Airborne Particulates or Gases (pCi/ml <sup>3</sup> )	Fish (pCi/kg, Wet)	Milk (pCi/l)	Food Products (pCi/kg, Wet)
Н-3	20,000*				
Mn-54	1,000		30,000		
Fe-59	400		10,000		
Co-58	1,000		30,000		
Co-60	300		10,000		
Zn-65	300		20,000		
Zr-Nb-95	400				
I-131	2	0.9		3	100
Cs-134	30	10	1,000	60	1,000
Cs-137	50	20	2,000	70	2,000
Ba-La-140	200			300	

 For drinking water samples. This is 40CFR Part 141 value. If no drinking water pathway exists, a value of 30,000 pCi/l may be used.





# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

### Table E-3

Detection Capabilities for Environmental Sample Analysis<sup>a</sup>

Lower Limit of Detection (LLD)<sup>bc</sup>

Analysis	S Water Airborne Particulates (pCi/l) or Gases (pCi/m <sup>3)</sup>		Fish (pCi/kg, Wet)	Fish Milk (pCi/kg, Wet) (pCi/l)		Sediment (pCi/kg, Dry)
Gross Beta	4	0.01				
H-3	2,000*					
Mn-54	15		130			
Fe-59	30		260			
Co-58, 60	15		130			· ·
Zn-65	30		260			
Zr-Nb-95	15					
I-131	1 <sup>d</sup>	0.07		1	60	
Cs-134	15	0.05	130	15	80	150
Cs-137	18	0.06	150	18	80	180
Ba-La-140	15			15		

\* If no drinking water pathway exists, a value of 3,000 pCi/I may be used.

# OFFSITE DOSE C. CLEAR PLANT



# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

# Table E-3 (Cont'd) TABLE NOTATION

\* This list does not mean that only these nuclides are to be considered. Other peaks that are identifiable, together with those of the above nuclides, shall also be analyzed and reported in the Annual Radiological Environmental Operating Report.

<sup>b</sup>Required detection capabilities for thermoluminescent dosimeters used for environmental measurements are given in Regulatory Guide 4.13.

"The LLD is defined as 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.

For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{4.66_{s}}{E \cdot V \cdot 2.22 \cdot Y \cdot Exp (-\lambda\Delta t)}$$

Where:

LLD is the "a priori" lower limit of detection as defined above, as picocuries per unit mass or volume.

s<sup>b</sup> 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.

Δt for environmental samples is the elapsed time between sample collection, or end of the sample collection period, and time of counting.

Typical values of E, V, Y, and  $\Delta t$  should be used in the calculation.



### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

### Table E-3 (Cont'd) Table Notation

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 an "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, unavoidable small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may render these LLDs unachievable. In such cases, the contributing factors shall be identified and described in the Annual Radiological Environmental Operating Report.

<sup>d</sup>LLD for drinking water samples. If no drinking water pathway exists, the LLD of gamma isotopic analysis may be used.

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# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

- K. <u>SIRW or Temporary Liquid Storage Tank</u>
  - 1. Requirement:

The concentration of radioactive material contained in the SIRW tank or any unprotected outside temporary tank\* shall be limited such that the mixture radionuclides do not exceed 1,000 times the effluent concentration (EC) as listed in 10CFR Part 20, Appendix B, Table 2, Column 2.

$$\underline{\underline{C}}_{a} + \underline{\underline{C}}_{b} \dots + \underline{\underline{C}}_{i} = <1000$$

$$EC_{a} EC_{b} EC_{i}$$

### 2. Action:

With the quantity of radioactive material in any of the above listed tanks exceeding the above concentration, immediately suspend all additions of radioactive material to the tank, within 48 hours reduce the tank contents to within the limit, and describe the events leading to this condition in the next Radiological Effluent Release Report.

3. Surveillance Requirement:

The concentration of radioactive material contained in each of the above listed 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.

#### <u>10</u>

A calculational methodology performed prior to the material being transferred may be used to show compliance with the requirement of this section if a representative sample cannot be obtained at least once per seven days. A representative sample of the radioactive material to be added to the SIRW or Temporary Liquid Storage Tank shall be analyzed and a calculation performed to show compliance with the 1000 EC limit.

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# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

4.– Bases:

This requirement will provide reasonable assurance that in the event of an uncontrolled release of the tanks' contents, the resulting concentrations would be less than the limits of 10CFR Part 20, Appendix B, Table 2, Column 2, at the nearest potable water supply and the nearest surface water supply in an Unrestricted Area. (The dilution between Palisades and the South Haven drinking water supply has been established as 1000).

\*Tanks included in this specification are those outdoor tanks that are not surrounded by liners, dikes, or walls capable of holding the tank contents and that do not have tank overflows and surrounding area drains connected to the liquid radwaste treatment system.

**NOTE:** The limit for the SIRW Tank may be exceeded for operational flexability if the conditions of this section are met.

- L. <u>Surveillance Requirement Time Intervals</u>
  - 1. Requirement:

Each Surveillance Requirement shall be performed within the specified surveillance interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval.

2. Action:

Failure to perform a Surveillance Requirement within the allowed surveillance interval shall constitute noncompliance with the operability requirements. The time limits of the action requirements are applicable at the time it is identified that a Surveillance Requirement has not been performed. The action requirements may be delayed for up to 24 hours to permit the completion of the surveillance when the allowed outage time limits of the action requirements are less than 24 hours. Surveillance Requirements do not have to be performed on inoperable equipment.



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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

3.- Surveillance Requirements:

The applicable surveillance interval frequencies are specified in Tables A-2 and C-2. The applicable sampling and/or analysis frequencies are specified in Tables A-1, B-1, C-1, D-1, and E-1. Extendable surveillance requirements are limited to channel checks, source checks, channel calibrations, channel functional checks, sampling frequencies and/or analysis frequencies.

4. Bases:

The maximum allowable extension for a surveillance interval is consistent with the surveillance requirements specified in the Technical Specifications, Section 4.0. Until relocated in the ODCM, all of the effluent surveillances were subject to these same requirements.

### M. <u>Sealed Source Contamination</u>

1. Requirement:

Each sealed source containing radioactive material either in excess of 100 microcuries of beta and/or gamma emitting material or 5 microcuries of alpha emitting material shall be free of greater than or equal to 0.005 microcuries of removable contamination.

- 2. Action:
  - a. With a sealed source having removable contamination in excess of 0.005 microcuries, immediately withdraw the sealed source from use and either:
    - (1) Decontaminate and repair the sealed source, or
    - (2) Dispose of the sealed source in accordance with applicable regulations.

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

- A report shall be prepared and submitted to the Commission on an annual basis if sealed source leakage tests reveal the presence of greater than or equal to 0.005 microcuries of removable contamination.
- 3. Surveillance Requirements:
  - a. Each category of sealed sources as described in the requirement with a half-life greater than 30 days (excluding Hydrogen-3), and in any other form than gas, shall be tested for leakage and/or contamination at intervals not to exceed 6 months.
  - b. The test shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State. The test method shall have a detection sensitivity of at least 0.005 microcuries per test sample.
  - c. The test sample shall be taken from the sealed source or, in the case of permanently mounted sources, from the surfaces of the mounting device on which contamination would be expected to accumulate.
  - d. The periodic leak test does not apply to sealed sources that are stored and not being used. These sources shall be tested prior to use or transfer to another licensee, unless tested within the previous 6 months. Sealed sources which are continuously enclosed within a shielded mechanism (ie, sealed sources within radiation monitoring or boron measuring devices) are considered to be stored and need not be tested unless they are removed from the shielded mechanism.
  - Sealed sources transferred without a certificate indicating the last test date shall be tested prior to being placed in use.

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# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

#### 4. Bases:

The requirement, actions, and surveillance requirements are the same as contained in the Technical Specification 6.21 prior to relocation to the ODCM and will provide assurance that sealed sources are tested to demonstrate that source integrity is being maintained.

#### IV. REPORTING REQUIREMENTS

#### A. <u>Radiological Effluent Release Report</u>

The Radioactive Effluent Release Report shall be submitted in accordance with 10CFR 50.36a by March 31 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be (1) consistent with the objectives outlined in the ODCM and Process Control Program and (2) in conformance with 10CFR 50.36a and Section IV.B.1 of Appendix I to 10CFR 50.

The report shall include an estimate of the uncertainty associated with the measurement of radioactive effluents. This error term is included to provide an estimate of the uncertainty and is <u>not</u> to be considered the absolute error associated with the measurements or to be used in determining compliance with these requirements.

These estimates will be based on a statistical analysis of a series of sample results (weighed appropriately for counting statistics) taken once a year from a minimum of one typical gaseous waste tank and from a minimum of one typical liquid waste tank. For noble gases released to the atmosphere from other than the waste gas system the error term will be estimated (and weight-averaged with the waste gas tank error) based on a statistical analysis of a series of sample results taken once a year (or the stack gas monitor counting statistics taken over one release per year) from each source contributing more than 10% of the total annual release.

The error term for iodine and particulates released to the atmosphere will be based on the counting statistics for one stack gas sample taken during the year.

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

The report shall include an estimate of the lower level of detection (in  $\mu$ Ci/ml) if the unidentified portion of the release exceeds 10% of the total annual releases. This estimate of the lower level of detection will be made for those gamma emitting isotopes listed in Appendix B of Regulatory Guide 1.21 (June 1974) and will be provided based on a typical background gamma spectrum.

The report shall provide the following specific terms:

- 1. Supplemental Information
  - a. Batch Releases:

The report should provide information relating to batch releases of liquid and gaseous effluents which are discharged to the environment. This information should include the number of releases, total time period for batch releases, and the maximum, mean, and minimum time period of release.

b. Abnormal Releases

The number of abnormal releases of radioactive material to the environment should be reported. The total curies of radioactive materials released as a result of abnormal releases should be included.

- 2. Gaseous Effluents
  - a. Gases
    - (1) Total curies of fission and activation gases releases.
    - (2) Average release rates ( $\mu$ Ci/s) of fission and activation gases for the quarterly periods covered by the report.

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# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

- (3) Percent of limit for releases of fission and activation gases.
- (4) Quarterly sums of total curies for each of the radionuclides determined to be released, based on analyses of fission and activation gases.

### b. lodines

- (1) Total curies of each of the isotopes, lodine-131, lodine-133 and lodine-135 determined to be released.
- (2) Average release rate ( $\mu$ Ci/s) of lodine-131/133.
- (3) Percent of limit for lodine-131/133.

#### c. Particulates

- (1) Total curies of radioactive material in particulate form with half-lives greater than 8 days determined to be released.
- (2) Average release rate ( $\mu$ Ci/s) of radioactive material in particulate form with half-lives greater than 8 days.
- (3) Percent of limit for radioactive material in particulate form with half-lives greater than 8 days.
- (4) Total curies for each of the radionuclides in particulate form determined to be released based on analyses performed.
- (5) Total curies of gross alpha radioactivity determined to be released.

### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

- d. Tritium
  - (1) Total curies of tritium determined to be released in gaseous effluents.
  - (2) Average release rate ( $\mu$ Ci/s) of tritium.
  - (3) Percent of applicable limits for tritium.

#### 3. Liquid Effluents

- a. Mixed Fission and Activation Products
  - (1) Total curies of radioactive material determined to be released in liquid effluents (not including tritium, dissolved and/or entrained gases, and alpha-emitting material).
  - (2) Average concentrations (µCi/ml) of mixed fission and activation products released to unrestricted areas, averaged over the quarterly periods covered by the report.
  - (3) Percent of applicable limit of average concentrations released to unrestricted areas.
  - (4) Quarterly sums of total curies for each of the radionuclides determined to be released in liquid effluents based on analyses performed.

#### b. Tritium

- (1) Total curies of tritium determined to be released in liquid effluents.
- (2) Average concentrations ( $\mu$ Ci/ml) of tritium released in liquid effluents to unrestricted areas, averaged over the quarterly periods covered by the report.
- (3) Percent of applicable limit of average concentrations released to unrestricted areas.

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## TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

- c. Dissolved and/or Entrained Gases
  - (1) Total curies of gaseous radioactive material determined to be released in liquid effluents.
  - (2) Average concentrations (µCi/ml) of dissolved and/or entrained gaseous radioactive material released to unrestricted areas, averaged over the quarterly periods covered by the report.
  - (3) Percent of applicable limit of average concentrations released to unrestricted areas.
  - (4) Total curies for each of the radionuclides determined to be released as dissolved and/or entrained gases in liquid effluents.

#### d. Alpha Radioactivity

Total curies of gross alpha-emitting material determined to be released in liquid effluents.

#### e. Volumes

- (1) Total measured volume (liters), prior to dilution, of liquid effluent released.
- (2) Total determined volume, in liters, of dilution water used during the period of the report.

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

4. – Radiological Impact on Man:

The Radioactive Effluent Release Report shall include potential doses to individuals and populations calculated using measured effluent and averaged meteorological data in accordance with the methodologies in the ODCM.

- a. Total body and significant organ doses (greater than 1 millirem to individuals in unrestricted areas from receiving water-related exposure pathways.
- b. The maximum offsite air doses (greater than 1 millirad) due to beta and gamma radiation at locations near ground level from gaseous effluents.
- c. Organ doses (greater than 1 millirem) to individuals in unrestricted areas from radioactive iodine and radioactive material in particulate form from the major pathways of exposure.
- d. Total body doses (greater than 1 manrem) to the population and average doses (greater than 1 millirem) to individuals in the population from receiving water-related pathways to a distance of 50 miles from the site.
- e. Total body doses (greater than 1 manrem) to the population and average doses (greater than 1 millirem) to individuals in the population from gaseous effluents to a distance of 50 miles from the site.

#### 5. ODCM Changes:

The Radiological Effluent Release Report shall include any changes made during the reporting period to the Offsite Dose Calculation Manual (ODCM), as well as a listing of new locations for dose calculations and/or environmental monitoring identified by the land use census pursuant to III.J.3.c.

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# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

#### B. <u>Radiological Environmental Operating Report</u>

The Radiological Environmental Operating Report covering the operation of the unit during the previous calendar year shall be submitted before May 1 of each year. The report shall include summaries, interpretations, and analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in; (1) the ODCM, and (2) Sections IV.B.2, IV.B.3, and IV.C of Appendix 1 to 10CFR50.

The Annual Radiological Environmental Operating Reports shall include summaries, interpretation and statistical evaluation of the results of the radiological environmental surveillance activities for the report period, including a comparison with preoperational studies, operational controls (as appropriate), and previous environmental surveillance reports and an assessment of the observed impacts of the Plant operation on the environment. The reports shall also include the results of land use census pursuant to III.J.3.c.

The Annual Radiological Environmental Operating Reports shall include summarized and tabulated results in the format of Table F-1 of all radiological environmental samples taken during the report period. In the event that some results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

The reports shall also include the following; a summary description of the radiological environmental monitoring program, including sampling methods for each sample type, a map of all sampling locations keyed to a table giving distances and directions from the reactor and the results of land use census required by III.J.3.c and results of the Interlaboratory Comparison Program required by III.J.3.e.

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### TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

### C. <u>Nonroutine Reports</u>

.

A report shall be submitted to the NRC in the event that; 1) the Radiological Environmental Monitoring Programs are not substantially conducted as described in Section III.J, or 2) an unusual or important event occurs from Plant operation that causes a significant environmental impact or affects a potential environmental impact. Reports shall be submitted within 30 days.



# TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

Table F-1 **Environmental Radiological Monitoring Program Summary** 

Name of Facility

Docket No

Location of Facility

**Reporting Period** 

(County State)

Medium or Pathway Sampled (Unit of Measure)	Type/Total Number of Analyses Performed	Lower Limit of Detection <sup>a</sup> (LLD)	All Indicator Locations Mean (f) Bange	Name Distance & Direction	Mean (f) <sup>b</sup> Range <sup>b</sup>	Control Locations Mean(f) Range	Number of REPORTABLE OCCURRENCES
Air Particulates (pCi/m <sup>®</sup> )	Gross ß 416 γ-Spec 32	0.003	0.08 (200/312) (0.05-2.0)	Middletown 6 miles 340°	0.10 (5/52) (0.08-2.0)	0.08 (8/104)- (0.05-1.40)	1
	Cs-137	0.003	0.05 (4/24) (0.03-0.13)	Smithville 2.5 miles 160°	0.08 (2/4) (0.03-0.13)	<lld< td=""><td>4</td></lld<>	4
	Ba-140	0.003	0.03 (2/24) (0.01-0.08)	Podunk 4 miles 270°	0.05 (2/4) (0.01-0.08)	0.02 (1/8)	1
	Sr-89 40	0.002	<lld< td=""><td></td><td></td><td><lld< td=""><td>0</td></lld<></td></lld<>			<lld< td=""><td>0</td></lld<>	0
	Sr-90 40	0.0003	<lld< td=""><td></td><td></td><td><lld< td=""><td>0</td></lld<></td></lld<>			<lld< td=""><td>0</td></lld<>	0
Fish pCi/kg (dry weight)	γ-Spec 8						
· · ·	Cs-137	80	<lld< td=""><td></td><td><lld< td=""><td>90 (1/4)</td><td>0</td></lld<></td></lld<>		<lld< td=""><td>90 (1/4)</td><td>0</td></lld<>	90 (1/4)	0
	Cs-134	80	<lld< td=""><td></td><td><lld< td=""><td><lld< td=""><td>0</td></lld<></td></lld<></td></lld<>		<lld< td=""><td><lld< td=""><td>0</td></lld<></td></lld<>	<lld< td=""><td>0</td></lld<>	0
	Co-60	80	120 (3/4) (90-200)	River Mile 35 Podunk River	See Column 4	<lld< td=""><td>0</td></lld<>	0

<sup>a</sup>Nominal Lower Limit of Detection (LLD) as defined in table notation c of Table E-3.

<sup>b</sup>Mean and range based upon detectable measurements only. Fraction of detectable measurements at specific locations is indicated in parentheses (f).

<sup>d</sup><u>NOTE</u>: The example data are provided for illustrative purposes only.

## TITLE: RELOCATED TECHNICAL SPECIFICATIONS PER NRC GENERIC LETTER 89-01 (TAC NO 75060)

# V. MAJOR MODIFICATIONS TO RADIOACTIVE LIQUID AND GASEOUS WASTE TREATMENT SYSTEMS

#### A. <u>Licensee Modifications</u>

Licensee initiated major modifications to the radioactive liquid and gaseous waste systems.

- 1. Shall be reported to the NRC pursuant to 10CFR 50.59. The discussion of each modification shall contain:
  - a. A summary of the evaluation that led to the determination that the modification could be made in accordance with 10CFR Part 50.59.
  - A description of the equipment, components and processes involved, and the interfaces with other Plant systems.
  - c. Documentation of the fact that the modification was reviewed and found acceptable by the PRC.
- 2. Shall become effective upon review and acceptance by the Plant General Manager.
- B. Definition of Major Radwaste System Modification
  - 1. Purpose:

The purpose of this definition is to assure that this requirement will be satisfied under clearly identifiable circumstances, and with the objective that current radwaste system capabilities are not jeopardized.

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2.– Definition:

A major radwaste system modification is a modification which would remove (either by bypassing for greater than 7 days or physical removal) or replace with less efficient equipment, any components of the radwaste system:

- a. Letdown filters or demineralizers.
- b. Vacuum degassifier (not applicable when the reactor is in cold shutdown and depressurized).
- c. Miscellaneous or clean waste evaporators.
- d. The present waste gas compressor/decay tank system.
- e. Fuel Pool filters/demineralizers.
- f. Radwaste polishing demineralizers.
- g. Radwaste Solidification system.

Improvements or additions to improve efficiency will not be considered major modifications unless a complete substitution of equipment or systems is made with equipment of unrelated design. Examples would be; 1) replacement of mechanical degassifier with steam, jet degassifier, 2) replacement of waste gas system with cryogenic system, 3) replacement of asphalt solidification with cement system, and 4) change from deep bead resins to Powdex, etc.