DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

July 25, 1979

TELEPHONE: AREA 704
373-4083

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Attention: Mr. Robert L. Baer, Chief
Light Water Reactor Project Branch No. 2

Re: McGuire Nuclear Station, Units 1 and 2
Docket Nos. 50-369, 50-370

Dear Mr. Denton:

Attached is the second draft of the McGuire Nuclear Station Radiological Effluent Technical Specifications. This draft supersedes those previously transmitted by my letters of December 18, 1978 and March 23, 1979.

In the sections on gaseous effluent monitoring, monitors have been added and deleted in Tables 3.3-13 and 4.3-13 to indicate final effluent monitoring points. Previously the tables included the containment purge, auxiliary building exhaust, air ejectors, and waste gas decay tanks which are monitored by the unit vent. The unit vent does not contain a flow measuring device, but each of the effluent streams entering the unit vent contains flow measuring devices and readout in the control room.

The gas monitoring requirement has been deleted from Table 4.11-2 since it is not a sampling and analysis requirement. Even if left in the specification, it would be difficult to maintain that sensitivity under all operating conditions. It would also be difficult to correlate gas grab samples with monitor readings when the laboratory analytical sensitivities are a factor of 100 higher than the monitor sensitivity.

545 077

ELECTRICITY FOR A PROGRESSIVE PIEDMONT
75th Anniversary
DUKE POWER 1904-1979

A009
SE
1/3
ADD: BRINKMAN
W/ENCL
A

7908010 485

The specification on liquid holdup tanks has been deleted since there is no need for outside radwaste tanks with the powdex backwash recovery system. If the powdex should be determined to be radioactive, it will be treated as radioactive waste. De minimus levels and solidification activity levels will be specified in either the ODCM or PCP.

The attached specifications do not include the changes to Section 6.0, Administrative Controls. These will be submitted at a later date.

Very truly yours,

William O. Parker, Jr.

GAC/sch

Attachment

~~NUREG-0472~~

DRAFT

RADIOLOGICAL EFFLUENT

TECHNICAL SPECIFICATIONS

FOR ~~PWRs~~

McGUIRE UNIT 1

~~Revision 2~~

~~March~~ 1979

June 8,

DEFINED TERMS

1.1 The DEFINED TERMS of this section appear in capitalized type and are Std applicable throughout these Technical Specifications.

OPERABLE - OPERABILITY

1.6 A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equip- Std ment, that are required for the system, subsystem, train, component or device to perform its functions(s), are also capable of performing their related support functions(s).

CHANNEL CALIBRATION

1.9 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 Std alarm and/or trip functions, and shall include the CHANNEL FUNCTIONAL TEST. The CHANNEL CALIBRATION may be performed by any series of sequential, overlapping or total channel steps such that the entire channel is calibrated.

CHANNEL CHECK

1.10 A CHANNEL CHECK shall be the qualitative assessment of channel behavior during operation by observation. This determination shall include, Std 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.

CHANNEL FUNCTIONAL TEST

1.11 A CHANNEL FUNCTIONAL TEST shall be:

a. Analog channels - the injection of a simulated signal into the channel as close to the sensor as practicable to verify Std OPERABILITY including alarm and/or trip functions.

~~*See NUREG-0212, NUREG-0103 and NUREG-0452 "Standard Technical Specifications for PWR's".~~

b. Bistable channels - the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions.

DOSE EQUIVALENT I-131

1.19 DOSE EQUIVALENT I-131 shall be that concentration of I-131 (μCi/gram) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134 and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, "Calculation of Distance Factors for Power and Test Reactor Sites."

Std pg 1-5

Additions To Standard Technical Specifications

new pg 1-7

SOURCE CHECK

1.29 A SOURCE CHECK shall be the qualitative assessment of channel response when the channel sensor is exposed to a radioactive source.

PROCESS CONTROL PROGRAM (PCP)

1.30 A PROCESS CONTROL PROGRAM shall contain the sampling, analysis, and formulation determination by which SOLIDIFICATION of radioactive wastes from liquid systems is assured.

SOLIDIFICATION

1.31 SOLIDIFICATION shall be the conversion of radioactive slurry and resin wastes ~~from liquid systems~~ to an ~~homogeneous~~ ~~uniformly distributed~~, ~~monolithic~~, immobilized solid. ~~with definite volume and shape, bounded by a stable surface of distinct outline on all sides (free-standing)~~.

OFFSITE DOSE CALCULATION MANUAL (ODCM)

1.32 The OFFSITE DOSE CALCULATION MANUAL shall contain the methodology and parameters used in the calculation of offsite doses due to radioactive gaseous and liquid effluents and in the calculation of gaseous and liquid effluent monitoring instrumentation alarm/trip setpoints.

GASEOUS RADWASTE TREATMENT SYSTEM

1.33 A GASEOUS RADWASTE TREATMENT SYSTEM is any system designed and installed to reduce radioactive gaseous effluents by collecting primary coolant system offgases from the primary system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

VENTILATION EXHAUST TREATMENT SYSTEM

1.34 A VENTILATION EXHAUST TREATMENT SYSTEM is 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 adsorbers 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.

PURGE - PURGING

1.35 PURGE or PURGING is the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is required to purify the confinement.

VENTING

1.36 VENTING is the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is not provided or required during VENTING. Vent, used in system names, does not imply a VENTING process.

TAPLE 1.2

FREQUENCY NOTATION

NOTATION	FREQUENCY
S	At least once per 12 hours
D	At least once per 24 hours.
W	At least once per 7 days.
M	At least once per 31 days.
Q	At least once per 92 days.
SA	At least once per 184 days.
R	At least once per 18 months.
S/U	Prior to each reactor startup.
P	Completed Prior to each release.
N.A.	Not applicable.

Revision

INSTRUMENTATION

RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.9 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.3-12 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 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 one or more radioactive liquid effluent monitoring instrumentation channels inoperable, take the ACTION shown in Table 3.3-12.

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.9 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 4.3-12.

TABLE 3.3-12

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	ACTION
1. Gross Radioactivity Monitors Providing Automatic Termination of Release		
a. Waste Liquid ~~Radwaste Effluent~~ Line	1	28
~~b. Steam Generator Blowdown Effluent Line~~	~~(1)~~	~~29~~
~~c. Turbine Building (Floor Drains) Sumps Effluent Line~~	~~(1)~~	~~30~~
b Containment Ventilation Unit Condensate Line	1	30
2. Gross Radioactivity Monitors Not Providing Automatic Termination of Release		
a. Nuclear Service Water ~~System Effluent~~ Line	1	30
b. Conventional Wastewater Treatment (inlet) Line	1	30
~~c. Containment Ventilation Unit Condensate Line~~	~~1~~	~~30~~

TABLE 3.3-12 (Continued)

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	ACTION
3. Flow Rate Measurement Devices		
a. ~~Liquid Radwaste Effluent~~ Waste Liquid Line	{1}	31
b. Discharge Canal	{1}	31
~~c. Steam Generator Blowdown Effluent Line~~	~~(1)~~	~~31~~
~~4. Radioactivity Recorders (*)~~		
~~a. Liquid Radwaste Effluent Line~~	~~(1)~~	~~33~~
~~b. Steam Generator Blowdown Effluent Line~~	~~(1)~~	~~34~~
~~4~~ 5. ~~Tank Level Indicating Devices (for tanks outside plant buildings)~~		
~~a.~~ Initial Holdup Pond	{1}	~~32~~
~~b.~~	~~(1)~~	~~32~~
~~c.~~	~~(1)~~	~~32~~
~~d.~~	~~(1)~~	~~32~~

~~(*Required only if alarm/trip set point is based on recorder-controller)~~

TABLE 3.3-12 (Continued)

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	ACTION
5~~6~~. Continuous Composite Samplers and Sampler Flow Monitor		
a. Conventional Wastewater Treatment (inlet) ~~(outlet)~~ Line *	1	30 ~~29~~
b. Containment Ventilation Unit Condensate Line	1	30

~~* Waste Water Collection Basin Discharge~~

TABLE 3.3-12 (Continued)

TABLE NOTATION

ACTION 28 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:

1. At least two independent samples are analyzed in accordance with Specification 4.11.1.1.3, and;

2. At least two technically qualified members of the Facility Staff independently verify ~~the~~ release rate calculations and discharge valving. ↑ input data for computerized

Otherwise, suspend release of radioactive effluents via this pathway.

ACTION 29 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 analyzed for gross radioactivity (beta or gamma) at a limit of detection of at least $10^{-7}\mu Ci/gram$;

1. At least once per 8 hours when the specific activity of the secondary coolant is > 0.01 μCi/gram DOSE EQUIVALENT I-131.

2. At least once per 24 hours when the specific activity of the secondary coolant is $\leq$ 0.01 μCi/gram DOSE EQUIVALENT I-131.

ACTION 30 With the numbers 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 lower limit of detection of at least $10^{-7}\mu Ci/ml$.

ACTION 31 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releses 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. Pump curves may be used to estimate flow.

TABLE 3.3-12 (Continued)

TABLE NOTATION

ACTION 32 With the numbers of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, liquid additions to this tank may continue for up to 30 days provided the tank liquid level is estimated during all liquid additions to the tank.

ACTION 33 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via the affected pathway may continue for up to 14 days provided the gross radioactivity level is determined at least once per 4 hours during actual release.

ACTION 34 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via the affected pathway may continue for up to 30 days provided the gross radioactivity level is determined at least once per 4 hours during actual release.

TABLE 4.3-12

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST
1. Gross Beta or Gamma Radioactivity Monitors Providing Alarm and Automatic Isolation				
a. Waste Liquid ~~Radwaste Effluents~~ Line	D	P	R(3)	Q(1)
~~b. Steam Generator Blowdown Effluent Line~~	~~D~~	~~M~~	~~R(3)~~	~~Q(1)~~
~~c. Turbine Building (Floor Drains) Sumps Effluent Line~~	~~D~~	~~M~~	~~R(3)~~	~~Q(1)~~
b. Containment Ventilation Unit Condensate Line	D	M	R(3)	Q(1)
2. Gross Beta or Gamma Radioactivity Monitors Providing Alarm But Not Providing Automatic Isolation				
a. Nuclear Service Water ~~System Effluent~~ Line	D	M	R(3)	Q(2)
b. Conventional Wastewater Treatment (inlet) Line	D	M	R(3)	Q(2)
~~c. Containment Ventilation Unit Condensate Line~~	~~D~~	~~M~~	~~R(3)~~	~~Q(2)~~
3. Continuous Composite Samplers and Sample Flow Measurement Device				
a. Conventional Wastewater Treatment inlet ~~(outlet)~~ Line	D	N/A	R	Q
b. Containment Ventilation Unit Condensate Line	D	N/A	R	Q

3/4 3-70

TABLE 4.3-12 (Continued)

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST
~~4. Activity Recorders~~				
~~a. Liquid Radwaste Effluent Line~~	~~D~~	~~N.A.~~	~~R~~	~~Q~~
~~b. Steam Generator Blowdown Effluent Line~~		~~N.A.~~	~~R~~	~~Q~~
~~4~~6. ~~Tank Level Monitors (for tanks outside the building)~~				
~~a.~~ Initial Holdup Pond	~~D*~~	N.A.	R	~~Q~~
~~b.~~	~~D*~~	N.A.	R	Q
~~c.~~	D*	N.A.	R	Q
~~d.~~	~~D*~~	N.A.	R	Q
5~~6~~. Flow Rate Monitors				
a. Waste Liquid ~~Radwaste Effluent~~ Line	D(4)	N.A.	R	Q
~~b.~~ Steam Generator Blowdown Line	D(4)	N.A.	R	Q
~~b~~c. ~~Discharge Canal~~	~~D(4)~~	~~N.A.~~	~~R~~	~~Q~~

545 091

TABLE 4.3-12 (Continued)

TABLE NOTATION

*During liquid additions to the tank.

(1) The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occurs if ~~any of the following conditions exist:~~

~~X~~ the Instrument indicates measured levels above the alarm/trip setpoint, and shall demonstrate that control room alarm annunciation occurs if any of the following conditions exist:

1 ~~2~~. Circuit failure.

2 ~~3~~. Instrument indicates a downscale failure.

3 ~~4~~. Instrument controls not set in operate mode.

(2) The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exist:

1. Instrument indicates measured levels above the alarm/trip 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 daily on any day on which continuous, periodic, or batch releases are made.

INSTRUMENTATION

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.10 The radioactive gaseous effluent monitoring instrumentation channels shown in Table 3.3-13 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 ODCM.

APPLICABILITY: As shown in Table 3.3-13.

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 one or more radioactive gaseous effluent monitoring instrumentation channels inoperable, take the ACTION shown in Table 3.3-13.

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.10 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 4.3-13.

McGuire UNIT 1

TABLE 3.3-13

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
~~1. Waste Gas Holdup System~~			
delete this monitor requirement since released through unit vent ~~a. Noble Gas Activity Monitor (Inline detector)~~	~~1~~ 1	*	35
~~b. Iodine Sampler~~	~~(1)~~	*	~~41~~
~~c. Particulate Sampler~~	(1)	*	~~41~~
b. Effluent System Flow Rate Measuring Device	1	*	36
~~e. Sampler Flow Rate Measuring Device~~	~~(1)~~	*	~~36~~
~~2A. Waste Gas Holdup System Explosive Gas Monitoring System (for systems designed to withstand the effects of a hydrogen explosion)~~			
~~a. Hydrogen Monitor~~	~~(1)~~	**	~~39~~
~~b. Hydrogen or Oxygen Monitor~~	~~(1)~~	**	~~33~~

TABLE 3.3-13 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
2. Waste Gas Holdup System Explosive Gas Monitoring System ~~(for systems not designed to withstand the effects of a hydrogen explosion)~~			
a. Hydrogen Monitor	1	**	40
b. Hydrogen or Oxygen Monitor	1	**	40
3. Containment Purge Monitoring System			
a. Noble Gas Activity Monitor	1	*	38
b. Iodine Sampler	1	*	41
c. Particulate Sampler	1	*	41
d. Effluent System Flow Rate Measuring Device	1	*	36
e. Sampler Flow Rate Measuring Device	1	*	36

McGUIRE UNIT 1

delete this section since release made through unit vent.

3-75

45 090

TABLE 3.3-13 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
1. ~~X~~ Unit Vent			
a. Noble Gas Activity Monitor	~~1~~	*	37
b. Iodine Sampler	~~1~~	*	41
c. Particulate Sampler	~~1~~	*	41
d. Effluent System Flow Rate Measuring Devices**	~~1~~	*	36
e. Sampler Flow Rate Measuring Device	~~1~~	*	36
~~5. Condenser Air Ejector~~			
~~a. Noble Gas Activity Monitor~~	1	*	37
~~b. Effluent Flow Rate Measuring Device~~	1	*	36
~~c. Sampler Flow Rate Measuring Device~~	1	*	36
~~6. Auxiliary Building Ventilation~~			
~~a. Noble Gas Activity Monitor~~	1	*	37
7. Spent Fuel Building Ventilation			
~~a. Noble Gas Activity Monitor~~	1	*	37

Delete these monitor requirements since releases go thru the unit vent.

(Containment Purge and Exhaust Monitors given on Table 3.3-3, item 3c.)

** Individual Effluent flows entering the stack shall have flow rate monitors. These flows shall be summed and available to control room operators.

	Minimum Channels Operable	Applicability	Action
3. Contaminated Parts Storage Warehouse			
a. Noble Gas Activity Monitor	1	*	37
b. Iodine Sampler	1	*	41
c. Particulate Sampler	1	*	41
d. Effluent System Flow Rate Measuring Device	1	*	36
e. Sampler Flow Rate Measuring Device	1	*	36
4. Radwaste Facility			
a. Noble Gas Activity Monitor	1	*	37
b. Iodine Sampler	1	*	41
c. Particulate Sampler	1	*	41
d. Effluent System Flow Rate Measuring Device	1	*	36
e. Sampler Flow Rate Measuring Device	1	*	36

3/4 3-76a 545 09

TABLE 3.3-13 (Continued)

TABLE NOTATION

*At all times.

**During waste gas holdup system operation (treatment for primary system offgases).

ACTION 35 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, the contents of the tank(s) may be released to the environment for up to 14 days provided that prior to initiating the release:

1. At least two independent samples of the tank's contents are analyzed, and

2. At least two technically qualified members of the Facility Staff independently verify ~~the~~ release rate calculations and discharge valve lineup; ↑ input data for computerized

Otherwise, suspend release of radioative effluents via this pathway.

ACTION 36 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 37 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 gross activity within 24 hours.

ACTION 38 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, immediately suspend PURGING of radioactive effluents via this pathway.

ACTION 39 ~~With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, operation of the waste gas holdup system may continue for up to 30 days provided grab samples are collected at least once per 4 hours and analyzed within the next 4 hours.~~ (deleted).

ACTION 40 With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, operation of this system may continue for up to 14 days. With (two) channels inoperable, be in at least HOT STANDBY within 6 hours.

TABLE 3.3-13 (Continued)

TABLE NOTATION

ACTION 41 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.

TABLE 4.3-13

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
~~1. Waste Gas Holdup System~~ (delete → this monitor requirement as in table 3)					
~~a. Noble Gas Activity Monitor (inline detector)~~	~~P~~	~~P~~	~~R(3)~~	~~Q(1)~~	~~*~~
	~~W~~	~~N/A~~	~~N/A~~	~~N/A~~	~~*~~
~~c. Particulate Sampler~~	~~W~~	~~N/A~~	~~N/A~~	~~N/A~~	~~*~~
b. 1. System Effluent Flow Rate Measuring Device	P	N/A	R	Q	*
~~c. Sampler Flow Rate Measuring~~	~~D~~	~~N/A~~	~~R~~	~~Q~~	~~*~~
1. 2. Waste Gas Holdup System Explosive Gas Monitoring System					
a. Hydrogen Monitor	D	N/A	Q(4)	M	**
b. Hydrogen Monitor (alternate)	D	N/A	Q(4)	M	**
c. Oxygen Monitor	D	N/A	Q(5)	M	**
~~d. Oxygen Monitor (alternate)~~	~~D~~	~~N/A~~	~~Q(5)~~	~~M~~	~~**~~

Replace with Figure UNIT 1

3/4 3-79

545 100

TABLE 4.3-13 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
delete this monitor requirement as in table 3. ~~Containment Purge Vent System~~					
a. Noble Gas Activity Monitor	D	P	R(3)	Q(1)	*
b. Iodine Sampler	W	N/A	N/A	N/A	*
c. Particulate Sampler	W	N/A	N/A	N/A	*
d. System Effluent Flow Rate Measuring Device	D	N/A	R	Q	*
e. ~~Sampler~~ Flow Rate Measuring Device	D	N/A	R	Q	*

McGUIRE UNIT 1

3/4 3-80

TABLE 4.3-13 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
2. ~~*~~ Unit Vent					
a. Noble Gas Activity Monitor	D	M	R(3)	Q(2)	*
b. Iodine Sampler	W	N.A.	N.A.	N.A.	*
c. Particulate Sampler	W	N.A.	N.A.	N.A.	*
d. System Effluent Flow Rate Measurement Device	D	N.A.	R	Q	*
e. Sampler Flow Rate Measurement Device	D	N.A.	R	Q	*
~~5. Condenser Air Ejector~~					
~~a. Noble Gas Activity Monitor~~	D	M	R(3)	Q(2)	*
~~b. Effluent Flow Rate Measuring Device~~	D	N.A.	R	Q	*
~~c. Sampler Flow Rate Measuring Device~~	D	N.A.	R	Q	*
~~6. Auxiliary Building Ventilation~~					
~~a. Noble Gas Activity Monitor~~	D	M	R(3)	Q(2)	*
~~7. Spent Fuel Building Ventilation~~					
~~a. Noble Gas Activity Monitor~~	D	M	R(3)	Q(2)	*
3. Contaminated Parts Storage Warehouse					
a. Noble Gas Activity Monitor	D	M	R(3)	Q(2)	*
b. Iodine Sampler	W	NA	NA	NA	*
c. Particulate Sampler	W	NA	NA	NA	*
d. System Effluent Flow Rate Measurement Device	D	NA	R	Q	*
e. Sampler flow rate	D	NA	R	Q	*

delete these monitor requirements as in table 3.

McGUIRE UNIT 1

3/4 3-81

5455 102

	Channel Check	Source Check	Channel Calibration	Channel Functional Test	Modes in which Surveillance Required
4. Radwaste Facility					
a. Noble Gas Activity Monitor	D	M	R(3)	Q(2)	*
b. Iodine Sampler	W	NA	NA	NA	*
c. Particulate Sampler	W	NA	NA	NA	*
d. System Effluent Flow Rate	D	NA	R	Q	*
e. Sampler Flow Rate	D	NA	R	Q	*

TABLE 4.3-13 (Continued)

TABLE NOTATION

*At all times.

**During waste gas holdup system operation (treatment for primary system offgases).

(1) The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occurs if ~~the any of the following conditions exist:~~

~~1.~~ Instrument indicates measured levels above the alarm/trip setpoint, and shall demonstrate that control room alarm annunciation occurs if any of the following conditions exist:

1 2. Circuit failure.

2 3. Instrument indicates a downscale failure.

3 4. Instrument controls not set in operate mode.

(2) The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exist:

1. Instrument indicates measured levels above the alarm/trip 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.)~~

TABLE 4.3-13 (Continued)

TABLE NOTATION

(4) The CHANNEL CALIBRATION shall include the use of standard gas samples containing a nominal:

1. One volume percent hydrogen, balance nitrogen; and

2. Four volume percent hydrogen, balance nitrogen.

(5) The CHANNEL CALIBRATION shall include the use of standard gas samples containing a nominal:

1. One volume percent oxygen, balance nitrogen; and

2. Four volume percent oxygen, balance nitrogen.

3/4.11 RADIOACTIVE EFFLUENTS

3/4.11.1 LIQUID EFFLUENTS

CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.11.1.1 The concentration of radioactive material released from the site (see Figure 5.1-4) shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2×10^{-4} uCi/ml total activity.

APPLICABILITY: At all times.

ACTION:

With the concentration of radioactive material released from the site 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. The results of pre-release analyses shall be used with the calculational methods in the ODCM to assure that the concentration at the point of release is maintained within the limits of Specification 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. The results of the previous post-release analyses shall be used with the calculational methods in the ODCM to assure that the concentrations at the point of release were maintained within the limits of Specification 3.11.1.1.

4.11.1.1.3 The radioactivity concentration of liquids discharged from continuous release points shall be determined by collection and analysis of samples in accordance with Table 4.11-1. The results of the analyses shall be used with the calculational methods in the ODCM to assure that the concentrations at the point of release are maintained within the limits of Specification 3.11.1.1.

TABLE 4.11-1

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

Liquid Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) (μCi/ml)[a]
A. Batch Waste Release Tanks[d]	P Each Batch	P Each Batch	Principal Gamma Emitters[f]	5×10^{-7}
			I-131	1×10^{-6}
	P One Batch/M	M	Dissolved and Entrained Gases (Gamma Emitters)	1×10^{-5}
	P Each Batch	M Composite[b]	H-3	1×10^{-5}
			Gross alpha	1×10^{-7}
			P-32	1×10^{-6}
	P Each Batch	Q Composite[b]	Sr-89, Sr-90	5×10^{-8}
			Fe-55	1×10^{-6}
B. Plant Continuous Releases[e]	Continuous[c]	W Composite[c]	Principal Gamma Emitters[f]	5×10^{-7}
			I-131	1×10^{-6}
	M Grab Sample	M	Dissolved and Entrained Gases (Gamma Emitters)	1×10^{-5}
	Continuous[c]	M Composite[c]	H-3	1×10^{-5}
			Gross alpha	1×10^{-7}
			P-32	1×10^{-6}
	Continuous[c]	Q Composite[c]	Sr-89, Sr-90	5×10^{-8}
			Fe-55	1×10^{-6}

~~PWR-STS~~ 1
MCGUIRE UNIT 1

TABLE 4.11-1 (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):

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

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 transformation)

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

2.22 is the number of transformations per minute per picocurie

Y is the fractional radiochemical yield (when applicable)

λ is the radioactive decay constant for the particular radionuclide

Δt 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. In calculating the LLD for a radionuclide determined by gamma-ray spectrometry, the background shall include the typical contributions of other radionuclides normally present in the samples. Typical values of E, V, Y, Δt shall be used in the calculation. The background count rate is calculated from the background counts that are determined to be within $\pm$ one FWHM (Full-Width-Half-Maximum) energy band about the energy of the gamma ray peak used for the quantitative analysis for that radionuclide.

TABLE 4.11-1 (Continued)

TABLE NOTATION

b. 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 which is representative of the liquids released.

c. To be representative of the quantities and concentrations of radioactive materials in liquid effluents, samples shall be collected continuously in proportion to the rate of flow of the effluent stream. 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.

d. 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, by a method described in the ODCM, to assure representative sampling.

e. A continuous release is the discharge of liquid wastes of a non-discrete volume; e.g., from a volume of system that has an input flow during the continuous release.

f. 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 detected and reported. Other peaks which are measurable and identifiable, together with the above nuclides, shall also be identified and reported. Nuclides which are below the LLD for the analyses shall be reported as "less than" the nuclide's LLD, and shall not be reported as being present at the LLD level for that nuclide. The "less than" values shall not be used in the required dose calculations.

RADIOACTIVE EFFLUENTS

DOSE

LIMITING CONDITION FOR OPERATION

3.11.1.2 The dose or dose commitment to an individual from radioactive materials in liquid effluents released from the site (see Figure 5.1-4) shall be limited:

a. During any calendar quarter: ≤ 1.5 mrem to the total body and ≤ 5 mrem to any organ, and

b. During any calendar year: ≤ 3 mrem to the total body and ≤ 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 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(s) for exceeding the limit(s) and defines the corrective actions to be taken to reduce the releases of radioactive materials in liquid effluents during the remainder of the current calendar quarter and during the ~~subsequent three calendar quarters~~ remaining quarters of the calendar year so that the cumulative dose or dose commitment to an individual from such releases during these four calendar quarters is within 3 mrem to the total body and 10 mrem to any organ. This Special Report shall also include (1) the results of radiological analyses of the drinking water source, and (2) the radiological impact on finished drinking water supplies with regard to the requirements of 40 CFR 141, Safe Drinking Water Act.* ← leave in original wording

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.1.2 Dose Calculations. Cumulative dose contributions from liquid effluents shall be determined in accordance with the ODCM at least once per 31 days.

~~*Applicable only if drinking water supply is taken from the receiving water body.~~

RADIOACTIVE EFFLUENTS

LIQUID WASTE TREATMENT

LIMITING CONDITION FOR OPERATION

3.11.1.3 The liquid radwaste treatment system shall be OPERABLE. The appropriate portions of the system shall be used to reduce the radioactive materials in liquid wastes prior to their discharge when the projected dose due to liquid effluent from the site (see Figure 5.1-4) when averaged over 31 days would exceed ~~0.06~~ 0.25 mrem to the total body or ~~0.2~~ 0.8 mrem to any organ.

APPLICABILITY: At all times.

ACTION:

a. With the liquid radwaste system inoperable for more than 31 days or with radioactive liquid 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 inoperability.

   2. Action(s) taken to restore the inoperable equipment to OPERABLE status.

   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 shall be projected at least once per 31 days, in accordance with 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 90 minutes at least once per 92 days unless the liquid radwaste system has been utilized to process radioactive liquid effluents during the previous 92 days.

RADIOACTIVE EFFLUENTS

LIQUID HOLDUP TANKS*

Delete this spec — station has powdex resin backwash recovery tanks.

LIMITING CONDITION FOR OPERATION

~~3.11.1.4~~ ~~The quantity of radioactive material contained in each of the~~ following tanks shall be limited to ≤ 10 curies, excluding tritium and dissolved or entrained noble gases.

a. Conventional Wastewater Treatment System Initial Holdup Pond.
~~b.~~
~~c.~~
~~b~~. Outside temporary tank.

APPLICABILITY: At all times.

ACTION:

a. With the quantity of radioactive material in any of the above listed tanks exceeding the above limit, immediately suspend all additions of radioactive material to the tank and within 48 hrs 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 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.~~

~~*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.~~

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 5.1-3) shall be limited to the following:

a. For noble gases: $\leq$ 500 mrem/yr to the total body and $\leq$ 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: $\leq$ 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.

4.11.2.1.4 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 the sampling and analysis program, specified in Table 4.11-2.

TABLE 4.11-2

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

Gaseous Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) (μCi/ml)[a]
A. Waste Gas Storage Tank	P Each Tank Grab Sample	P Each Tank	Principal Gamma Emitters[g]	1×10^{-4}
B. Containment Purge	P Each Purge[b] Grab Sample	P Each Purge[b]	Principal Gamma Emitters[g]	1×10^{-4}
			H-3	1×10^{-6}
C. Condenser Air Ejector	M[b], ~~P~~, c Grab Sample	M[b]	Principal Gamma Emitters[g]	1×10^{-4}
			H-3	1×10^{-6}
D. 1) Unit Vent 2) Radwaste Facility 3) Contaminated Parts Storage Warehouse	Continuous[f]	W[d] Charcoal Sample	I-131	1×10^{-12}
			I-133	1×10^{-10}
	Continuous[f]	W[d] Particulate Sample	Principal Gamma Emitters[g] (I-131, Others)	1×10^{-11}
	Continuous[f]	M Composite Particulate Sample	Gross alpha[i]	1×10^{-11}
	Continuous[f]	Q Composite Particulate Sample	Sr-89, Sr-90	1×10^{-11}
Delete →	~~Continuous[f]~~	~~Noble Gas Monitor~~	~~Gross Noble Gases[h] Beta & Gamma~~	~~1×10^{-6}~~

PWR-GISS
McGUIRE UNIT 1

3/4 11-9

545 114

TABLE 4.11-2 (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):

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

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 transformation)

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

2.22 is the number of transformation per minute per picocurie

Y is the fractional radiochemical yield (when applicable)

λ is the radioactive decay constant for the particular radionuclide

Δt 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. In calculating the LLD for a radionuclide determined by gamma-ray spectrometry, the background shall include the typical contributions of other radionuclides normally present in the samples. Typical values of E, V, Y and Δt shall be used in the calculation. The background count rate is calculated from the background counts that are determined to be within ± one FWHM (Full-Width-Half-Maximum) energy band about the energy of the gamma ray peak used for the quantitative analysis for that radionuclide.

TABLE 4.11-2 (Continued)

TABLE NOTATION

b. Analyses shall also be performed following shutdown, startup, or similar operational occurrence which could alter the mixture of radionuclides.

c. Tritium grab samples shall be taken at least once per 24 hours when the refueling canal is flooded.

d. Samples shall be changed at least once per 7 days and analyses shall be completed within 48 hours after charging (or after removal from sampler). Sampling, and analyses shall also be performed at least once per 24 hours for at least 7 days following each shutdown, startup or thermal power level change exceeding 15% of RATED THERMAL POWER in one hour. When samples collected for 24 hours are analyzed, the corresponding LLD's may be increased by a factor of 10.

~~e. Tritium grab samples shall be taken at least once per 7 days from the ventilation exhaust from the spent fuel pool area.~~

f. 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.

g. 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, together with the above nuclides, shall also be identified and reported. Nuclides which are below the LLD for the analyses shall be reported as "less than" the nuclide's LLD and shall not be reported as being present at the LLD level for that nuclide. The "less than" values shall not be used in the required dose calculations.

h. The noble gas continuous monitor shall be calibrated using laboratory analyses of the grab samples from A, B and C on Table 4.11-2.

i. The composite filter tape will be analyzed for alpha activity by analyzing sections of the tape per unit tape length to assure that at least 4 sections are analyzed per collection period.

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 the site (see Figure 5.1-3) shall be limited to the following:

a. During any calendar quarter: ≤ 5 mrad for gamma radiation and ≤ 10 mrad for beta radiation and,

b. During any calendar year: ≤ 10 mrad for gamma radiation and ≤ 20 mrad for beta radiation.

(The dose design objectives shall be reduced based on predicted noble gas releases from the turbine building if effluent sampling is not provided. The dose design objectives shall also be reduced based on expected public occupancy of areas, e.g., beaches and visitor centers within the site boundary.)

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 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(s) for exceeding the limit(s) and define the corrective actions to be taken to reduce the releases of radioactive noble gases in gaseous effluents during the remainder of the current calendar quarter and during the ~~subsequent three calendar quarters~~ remaining quarters of the calendar year so that the cumulative dose during these four calendar quarters is within (10) mrad for gamma radiation and (20) mrad for beta radiation.

leave in original wording

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 every 31 days.

RADIOACTIVE EFFLUENTS

DOSE, RADIOIODINES, RADIOACTIVE MATERIAL 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 the site (see Figure 5.1-3) shall be limited to the following:

a. During any calendar quarter. $\leq$ 7.5 mrem to any organ and,

b. During any calendar year: $\leq$ 15 mrem to any organ.

(The dose design objective shall be reduced based on predicted carbon-14 releases and turbine building releases if effluent sampl.ng is not provided.)

APPLICABILITY: At all times.

ACTION.

a. With the calculated dose from the release of radioiodines, radioactive materials in particulate form, or radionuclides (other than noble gases) with half lives greater than 8 days, in gaseous effluents exceeding any 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 identifies the cause(s) for exceeding the limit and defines the corrective actions to be taken to reduce the releases of radioiodines and radioactive materials in particulate form, and radionuclides (other than noble gases) with half-lives greater than 8 days in gaseous effluents during the remainder of the current calendar quarter and during ~~the subsequent three calendar quarters~~ remaining quarters of the calendar year so that the cumulative dose or dose commitment to an individual from such releases during these four calendar quarters is within (15) mrem to any organ.

leave in original

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 every 31 days.

RADIOACTIVE EFFLUENTS

GASEOUS RADWASTE TREATMENT

LIMITING CONDITION FOR OPERATION

3.11.2.4 The gaseous radwaste treatment system and the ventilation exhaust treatment system shall be OPERABLE. The appropriate portions of the gaseous radwaste treatment system shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected gaseous effluent air doses due to gaseous effluent releases from the site (see Figure 5.1-3) when averaged over 31 days would exceed ~~0.2~~ 0.2 mrad for gamma radiation and ~~0.4~~ 0.4 mrad for beta radiation and the appropriate portions of the ventilation exhaust treatment system shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected doses due to gaseous effluent releases from the site (see Figure 5.1-3) when averaged over 31 days would exceed ~~0.3~~ 1.25 mrem to any organ.

APPLICABILITY: At all times.

ACTION:

a. With the gaseous radwaste treatment system and/or 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 of subsystems and the reason for inoperability.

   2. Action(s) taken to restore the inoperable equipment to OPERABLE status.

   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.

4.11.2.4.1 Doses due to gaseous releases from the site shall be projected at least once per 31 days, in accordance with the ODCM.

4.11.2.4.2 The gaseous radwaste treatment system and ventilation exhaust system shall be demonstrated OPERABLE by operating the gaseous radwaste treatment system equipment and ventilation exhaust treatment system equipment for at least 90 minutes, at least once per 92 days unless the appropriate system has been utilized to process radioactive gaseous effluents during the previous 92 days.

515 120

RADIOACTIVE EFFLUENTS

DOSE

LIMITING CONDITION FOR OPERATION

3.11.2.5 The dose or dose commitment to any real individual from uranium fuel cycle sources shall be limited to $\leq$ 25 mrem to the total body or any organ (except the thyroid, which shall be limited to $\leq$ 75 mrem) over 12 consecutive months.

APPLICABILITY: At all times.

ACTION:

a. With the calculated dose 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, in lieu of any other report required by Specification 6.9.1, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 and limit the subsequent releases releases such that the dose or dose commitment to any real individual from uranium fuel cycle sources is limited to $\leq$ 25 mrem to the total body or any organ (except thyroid, which is limited to $\leq$ 75 mrem) over 12 consecutive months. This Special Report shall include an analysis which demonstrates that radiation exposures to any real individual from uranium fuel cycle sources (including all effluent pathways and direct radiation) are less than the 40 CFR Part 190 Standard. Otherwise, obtain a variance from the Commission to permit releases which exceed the 40 CFR Part 190 Standard.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.5 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.

RADIOACTIVE EFFLUENTS

EXPLOSIVE GAS MIXTURE ~~(Systems not designed to withstand a hydrogen explosion)~~

LIMITING CONDITION FOR OPERATION

3.11.2.6 The concentration of hydrogen and/or oxygen in the waste gas holdup system shall be limited to $\leq \frac{2}{3}$% by volume.

APPLICABILITY: At all times.

ACTION:

a. With the concentration of hydrogen and/or oxygen in the waste gas holdup system > $\frac{2}{3}$% by volume but $\leq$ 4% by volume, restore the concentration of hydrogen and/or oxygen to within the limit 48 hours.

b. With the concentration of hydrogen and/or oxygen in the waste gas holdup system > 4% by volume, immediately suspend all additions of waste gases to the system and reduce the concentration of hydrogen and/or oxygen to $\leq \frac{2}{3}$% within 48 hours.

c. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.2.6 The concentrations of hydrogen and/or oxygen in the waste gas holdup system shall be determined to be within the above limits by continuously monitoring the waste gases in the waste gas holdup system with the hydrogen and/or oxygen monitors required OPERABLE by Table 3.3-13 of Specification 3.3.3.10.

RADIOACTIVE EFFLUENTS

GAS STORAGE TANKS

LIMITING CONDITION FOR OPERATION

3.11.2.7 The quantity of radioactivity contained in each gas storage tank shall be limited to $\leq$ 49,000 curies noble gases (considered as Xe-133).

APPLICABILITY: At all times.

ACTION:

a. With the quantity of radioactive material in any gas storage tank 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

4.11.2.6 The quantity of radioactive material contained in each gas storage tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank.

3/4.11.3 SOLID RADIOACTIVE WASTE

LIMITING CONDITION FOR OPERATION

3.11.3.1 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 packaging requirements of 10 CFR Part 20 and/or 10 CFR Part 71 not satisfied, suspend shipments of 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 of subsystems and the reasons for inoperability.

   2. Action(s) taken to restore the inoperable equipment to OPERABLE status.

   3. A description of alternative used for SOLIDIFICATION and packaging of wastes.

   4. Summary description of action(s) taken to prevent a recurrence.

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

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

a. Performance of functional tests of the equipment and components of the solid radwaste system,

b. Operating the solid radwaste system at least once in the previous 92 days in accordance with the PROCESS CONTROL PROGRAM, or

c. ~~Verification of the~~ Existence of a valid contract for SOLIDIFICATION to be performed by a contractor in accordance with a PROCESS CONTROL PROGRAM.

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

delete a. section

~~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 SOLIDIFICATON 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.

delete b. section

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 6.14, to assure SOLIDIFICATION of subsequent batches of waste.

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 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 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 report pursuant to 6.9.1.13. When more than one of the radionuclides in Table 3.12-2 are detected in the sampling medium, this report shall be submitted if:

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

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~~ becoming permanently 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,

LIMITING CONDITION FOR OPERATION (Continued)

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 the table and figure in the ODCM and shall be analyzed pursuant to the requirements of Tables 3.12-1 and 4.12-1.

TABLE 3.12-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Sample Locations**	Sampling and Collection Frequency	Type and Frequency of Analysis
1. AIRBORNE			
a. Radioiodine and Particulates	5 LOCATIONS ~~(Locations 1-5)~~	Continuous operation of sampler with sample collection as required by dust loading but at least once per 7 days.	Radioiodine canister. GAMMA Isotopic ANALYSIS Pof I-131 ON each Sample Particulate sampler. ~~Analyze for gross beta radioactivity > 24 hours following filter change.~~ Gamma isotopic analysis on each sample ~~gross beta activity is > 10 times the yearly mean of control samples. Perform gamma isotopic analysis on composite (by location) sample at least once per 92 days.~~
2. DIRECT RADIATION	10 LOCATIONS ~~(Locations 1-8) > 2 dosimeters or > 1 instrument for continuously measuring and recording dose rate at each location.~~	Continuous integration with collection At least once per 92 days. ~~At least once per 92 days. (Read-out frequencies are determined by type of dosimeters selected.)~~	Gamma dose ON each dosimeter. ~~At least once per 31 days.~~ ~~or~~ ~~Gamma dose. At least once per 92 days.~~

** Sample locations are given on figure and table in Offsite Dose Calculation Manual (ODCM)

TABLE 3.12-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

McGUIRE UNIT 1

Exposure Pathway and/or Sample	Sample Locations**	Sampling and Collection Frequency	Type and Frequency of Analysis
3. WATERBORNE			
a. Surface	3 LOCATIONS ~~(Locations 9 and 10)~~	Composite* sample collected over a period of ≤ 31 days.	Gamma isotopic analysis of each composite sample by location. Tritium analysis of composite sample at least once per 92 days.
~~b. Ground~~	~~(Locations 11 and 12)~~	~~At least once per 92 days.~~	~~Gamma isotopic and tritium analyses of each sample.~~
b. Drinking	~~(Locations 13-15)~~ 4 LOCATIONS	~~Composite* sample collected over a period of ≤ 14 days, if I-131 analysis is performed; or~~ Composite* sample collected over a period of ≤31 days.	~~I-131 analysis of each composite sample;~~ ~~and~~ Gross beta and gamma isotopic analysis of each composite sample. Tritium analysis of composite sample at least once per 92 days.
C.~~d~~. Sediment from Shoreline	3 LOCATIONS ~~(Locations 18)~~	At least once per 184 days.	Gamma isotopic analysis of each sample.

* Composite samples shall be collected by collecting an aliquot at intervals not exceeding 2 hours.
** Sample locations are shown on figure in the Ofisite Dose Calculation Manual (ODCM)

3/4 12-4

EAS 129

TABLE 3.12-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

~~PURSSL~~ McGUIRE UNIT 1

Exposure Pathway and/or Sample	Sample Locations**	Sampling and Collection Frequency	Type and Frequency of Analysis
4. INGESTION			
a. Milk	4 Locations ~~(Locations 17-20)~~	At least once per 15 days when animals are on pasture; at least once per 31 days at other times.	Gamma isotopic and I-131 analysis of each sample.
b. Fish and Invertebrates	2 Locations ~~(Locations 21 and 22)~~	~~One sample in season, or~~ At least once per 184 days ~~if not seasonal~~. One sample of each of the following species: 1. Bass 2. Catfish	Gamma isotopic analysis ~~on edible portions~~. on each Sample
c. ~~Food Products~~ Broad Leaf Vegetation	2 Locations ~~(Locations 23-25)~~	At Least once per 31 days.	Gamma isotopic analysis ~~on edible portion~~.
		~~1.~~ ~~2.~~ ~~3.~~	
	~~(Location 26)~~	~~At time of harvest. One sample of broad leaf vegetation.~~	~~I-131 analysis~~.

** Sample locations are shown on figure in Offsite Dose Calculation Manual

3/4 12-5

545 130

~~PNPS~~ McGUIRE UNIT 1

3/4 12-6

TABLE 3.12-2

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

Analysis	Reporting Levels: Water (pCi/l)	Airborne Particulate or Gases (pCi/m³)	Fish (pCi/Kg, wet)	Milk (pCi/l)	Food Products (pCi/Kg, wet)
H-3	2×10^4 (a)				
Mn-54	1×10^3		3×10^4		
Fe-59	4×10^2		1×10^4		
Co-58	1×10^3		3×10^4		
Co-60	3×10^2		1×10^4		
Zn-65	3×10^2		2×10^4		
Zr-Nb-95	4×10^2				
I-131	2 (b)	~~0.9~~ 1.0		3	1×10^2
Cs-134	30	10	1×10^3	60	1×10^3
Cs-137	50	20	2×10^3	70	2×10^3
Ba-La-140	2×10^2			3×10^2	

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

~~(b) Total for parent and daughter.~~

(b) If low level I-131 analyses are performed.

545 131

TABLE 4.12-1

LOWER LIMITS OF DETECTION (LLD)[ad]

Analysis	Water (pCi/l)	Airborne Particulate or Gas (pCi/m^3)	Fish (pCi/kg,wet)	Milk (pCi/l)	Broad leaf Vegetation ~~Food Products (pCi/kg,wet)~~	Sediment (pCi/kg,dry)
gross beta	4[b]	1×10^{-2}				
^{3}H	2000 [redacted]					
^{54}Mn	15		130			
^{59}Fe	30		260			
$^{58,60}Co$	15		130			
^{65}Zn	30		260			
^{95}Zr-Nb	15[c]					
^{131}I	15[e]	7×10^{-2}		1	60	
$^{134,137}Cs$	15([redacted]), 18	5.6×10^{-2}	130, 150	15, 18	~~60~~ 80	150
^{140}Ba-La	15[c]			15[c]		

3/4 12-7

TABLE 4.12-1 (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):

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

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 transformation)

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

2.22 is the number of transformations per minute per picocurie

Y is the fractional radiochemical yield (when applicable)

λ is the radioactive decay constant for the particular radionuclide

ΔT is the elapsed time between sample collection (or end of the sample collection period) and time of counting (for environmental samples, not plant effluent 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

TABLE 4.12-1 (Continued)

TABLE NOTATION

theoretically predicted variance. In calculating the LLD for a radionuclide determined by gamma-ray spectrometry, the background shall include the typical contributions of other radionuclides normally present in the samples (e.g., potassium-40 in milk samples). Typical values of E, V, Y and ΔT should be used in the calculations.

b. LLD for drinking water.

c. ~~LLD for parent and daughter.~~ LLD for either parent or daughter, whichever is easiest to detect

d. This does not mean that only the radionuclides in Table 4.12-1 are to be detected and reported. Other peaks which are measurable and identifiable, together with the above nuclides, shall be identified and reported.

e. The calculated dose from I-131 in drinking water at all locations is less than 1 mrem per year. Therefore low level analyses will not be routinely performed. Low level I-131 analyses will be performed if abnormal releases occur which could reasonably result in 1pCi/Liter of I-131 in drinking water

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. ~~(for elevated releases as defined in Regulatory Guide 1.111, (Rev 1) July 1977, the land use census shall also identify the locations of all milk animals and all gardens of greater than 500 square feet producing fresh leafy vegetables in each of the 16 meteorological sectors within a distance of three 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 4.11.2.3.1, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report, in leiu of any other 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) greater than at a location from which samples are currently being obtained in accordance with Specification 3.12.1, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report, in lieu of any other report, which identifies the new location. The new location shall be added to the radiological environmental monitoring program within 30 days, if possible. 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.

*Broad leaf vegetation sampling ~~may~~ shall be performed at the site boundary in the direction sector with the highest D/Q in lieu of the garden census.

RADIOLOGICAL ENVIRONMENTAL MONITORING

Delete this spec include in ODCM

3/4.12.3 INTERLABORATORY COMPARISON PROGRAM

LIMITING CONDITION FOR OPERATION

3.12.3 Analyses shall be performed on radioactive materials supplied as part of an Interlaboratory Comparison Program which has been approved by NRC.

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 Specification 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

delete this section

4.12.3 A summary of results obtained as part of the above required Interlaboratory Comparison Program and in accordance with the Offsite Dose Calculation Manual (ODCM) shall be included in the Annual Radiological Environmental Operating Report.

545 136

3/4.3.3.9 RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

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. The alarm/trip setpoints for these instruments shall be calculated in accordance with procedures in the Offsite Dose Calculation Manual (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.

3/4.3.3.10 RADIOACTIVE GASEOUS EFFLUENT INSTRUMENTATION

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. The alarm/trip setpoints for these instruments shall be calculated in accordance with procedures in the Offsite Dose Calculation Manual (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.

3/4.11 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 from the site 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 outside the site will result in exposures within (1) the Section II.A design objectives of Appendix I, 10 CFR Part 50, to an individual and (2) the limits of 10 CFR Part 20.106(e) to the population. The concentration limit for dissolved or entrained noble gases is based upon the assumption that Xe-135 is the controlling radioisotope and its MPC in air (submersion) was converted to an equivalent concentration in water using the methods described in International Commission on Radiological Protection (ICPP) 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 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 40 CFR 141. The dose calculations in the ODCM implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I is to 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 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. NUREG-0133 provides methods for dose calculations consistent with Regulatory Guides 1.109 and 1.113.

BASES

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.

3/4.11.1.3 LIQUID WASTE TREATMENT

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 requirements 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 I to 10 CFR Part 50 and design objective and in Section II.D of Appendix A 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 rate at any time at the site boundary from gaseous effluents from all units on the site will be within the annual dose limits of 10 CFR Part 20 for unrestricted areas. The annual dose limits are the doses associated with the concentrations of 10 CFR Part 20, Appendix B, Table II, Column 2. These limits provide reasonable assurance that radioactive material discharged in gaseous effluents will not result in the exposure of an individual in an unrestricted area, 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 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 an individual at or beyond the site boundary to ≤ 500 mrem/year to the total body or to ≤ 3,000 mrem/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background to an infant via the cow-milk-infant pathway to ≤ 1500 mrem/year for the nearest cow to the plant.

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

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 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 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 conform with the guides of Appendix I to be shown by calculational procedures based on models and data such that the actual exposure of an individual through the 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 will be 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. NUREG-0133 provides methods for dose calculations consistent with Regulatory Guides 1.109 and 1.111.

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

This 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 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 required to be consistent with the methodology provided in Regulatory Guide 1.109, "Calculating 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 I, October 1977 and Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transpo . 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 material 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 GASEOUS WASTE TREATMENT

The OPERABILITY of the gaseous radwaste treatment system and the ventilation exhaust treatment systems ensures that the systems 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 Part 50, and design objective Section IID 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 Sections II.B and II.C of Appendix I, 10 CFR Part 50, for gaseous effluents.~~

BASES

3/4.11.2.5 DOSE

This specification is provided to meet the dose limitations of 40 CFR 190. 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 real individual will exceed 40 CFR 190 if the individual reactors remain within the reporting requirement level. The Special Report will describe a course of action which should result in the limitation of dose to a real individual for 12 consecutive months to within the 40 CFR 190 limits. For the purposes of the Special Report, it may be assumed that the dose commitment to the real individual 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.

3/4.11.2.6 EXPLOSIVE GAS MIXTURE

This specification is provided to ensure that the concentration of potentially explosive gas mixtures contained in the waste gas treatment system is maintained below the flammability limits of hydrogen and oxygen. (Automatic control features are included in the system to prevent the hydrogen and oxygen concentrations from reaching these flammability limits. These automatic control features include isolation of the source of hydrogen and/or oxygen, automatic diversion to recombiners, or injection of dilutants to reduce the concentration below the flammability limits.) 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.

3/4.11.2.7 GAS STORAGE TANKS

Restricting the quantity of radioactivity contained in each gas storage tank provides assurance that in the event of an uncontrolled release of the tanks contents, the resulting total body exposure to an individual at the nearest exclusion area boundary will not exceed 0.5 rem. This is consistent with Standard Review Plan 15.7.1, "Waste Gas System Failure."

BASES

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 and packaging prior to being shipped offsite. This specification implements the requirements of 10 CFR Part 50.36a and General Design Criteria 60 of Appendix A to 10 CFR Part 50. The process parameters used in establishing the PROCESS CONTROL PROGRAM may include, but are not limited to waste type, waste pH, waste/liquid/solidification agent/catalyst ratios, waste oil content, waste principal chemical constituents, mixing and curing times.

3/4.12 RADIOLOGICAL 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 expsures of individuals resulting from the station operation. This monitoring program 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 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. The LLD's for drinking water meet the requirements of 40 CFR 141. For more complete discussion of the LLD and other detection limits, see the following:

(1) HASL Procedures Manual, HASL-300 (revised annually).

(2) Currie, L. A., "Limits for Qualitative Detection and Quantitative Determination - Application to Radiochemistry" Anal. Chem. 40, 586-93 (1968).

(3) Hartrwell, J. K., "Detection Limits for Radioisotopic Counting Techniques," Atlantic Richfield Hanford Company Report ARH-2537, (June 22, 1972).

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 INTERLABORATORY COMPARISON PROGRAM

The requirement for participation in an 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 a quality assurance program for environmental monitoring in order to demonstrate that the results are reasonably valid.

5.0 DESIGN FEATURES

5.1 SITE

EXCLUSION AREA

5.1.1 The exclusion area shall be as shown in Figure 5.1-1.

LOW POPULATION ZONE

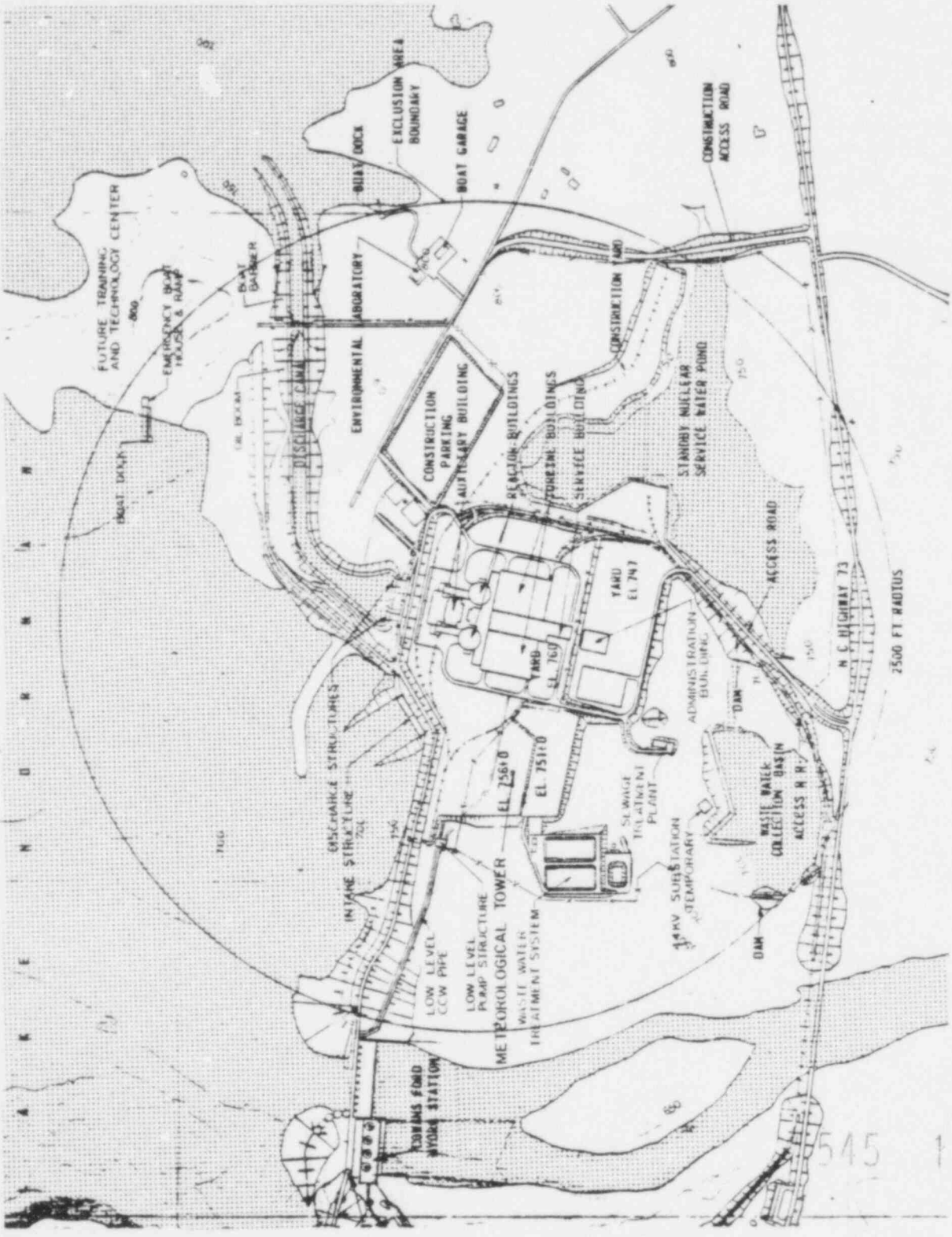
5.1.2 The low population zone shall be as shown in Figure 5.1-2.

SITE BOUNDARY FOR GASEOUS EFFLUENTS

5.1.3 The site boundary for gaseous effluents shall be shown in Figure 5.1-3.

SITE BOUNDARY FOR LIQUID EFFLUENTS

5.1.4 The site boundary for liquid effluents shall be shown in Figure 5.1-4.

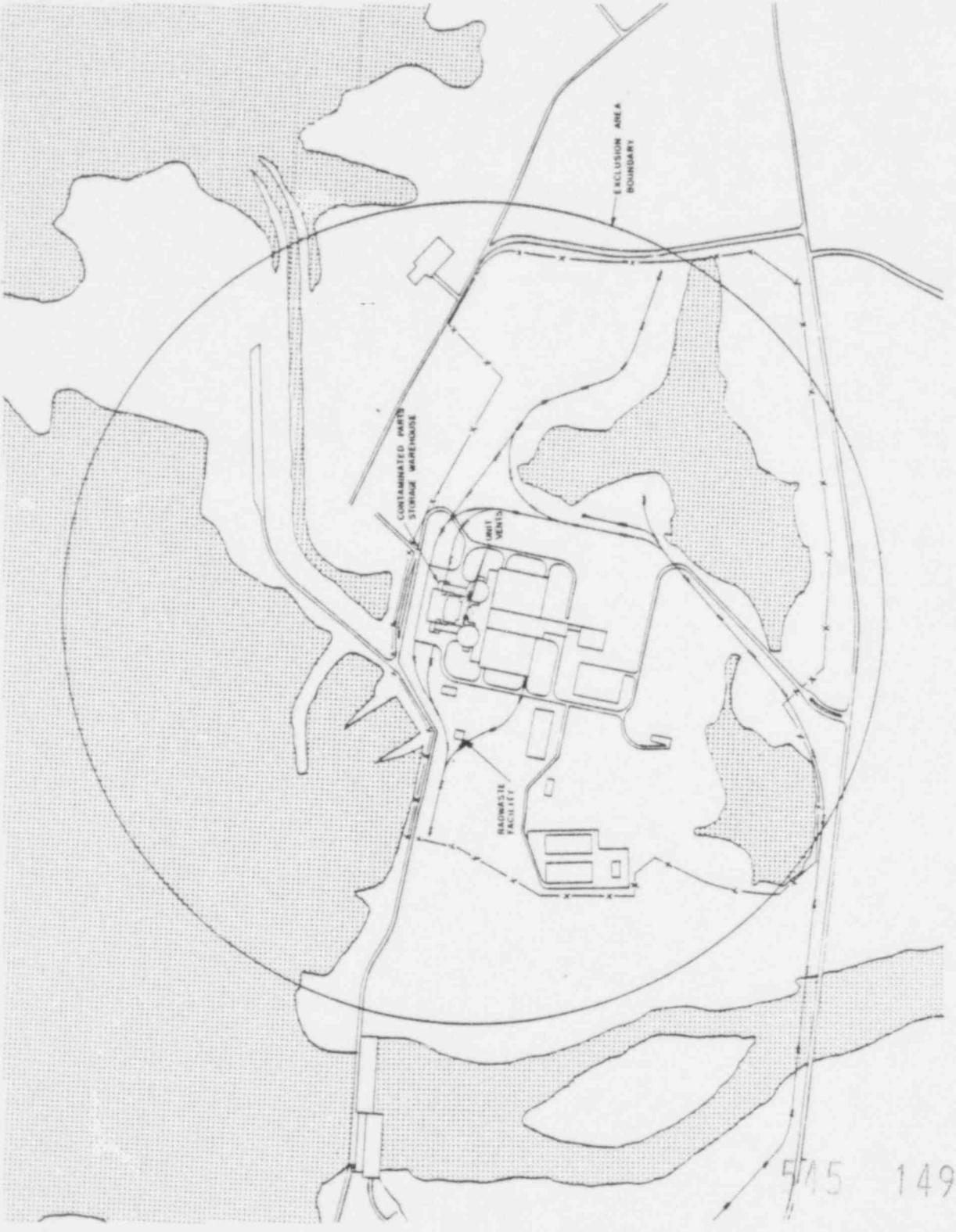


545 147

EXCLUSION AREA
McGUIRE NUCLEAR STATION
Figure 5.1-1

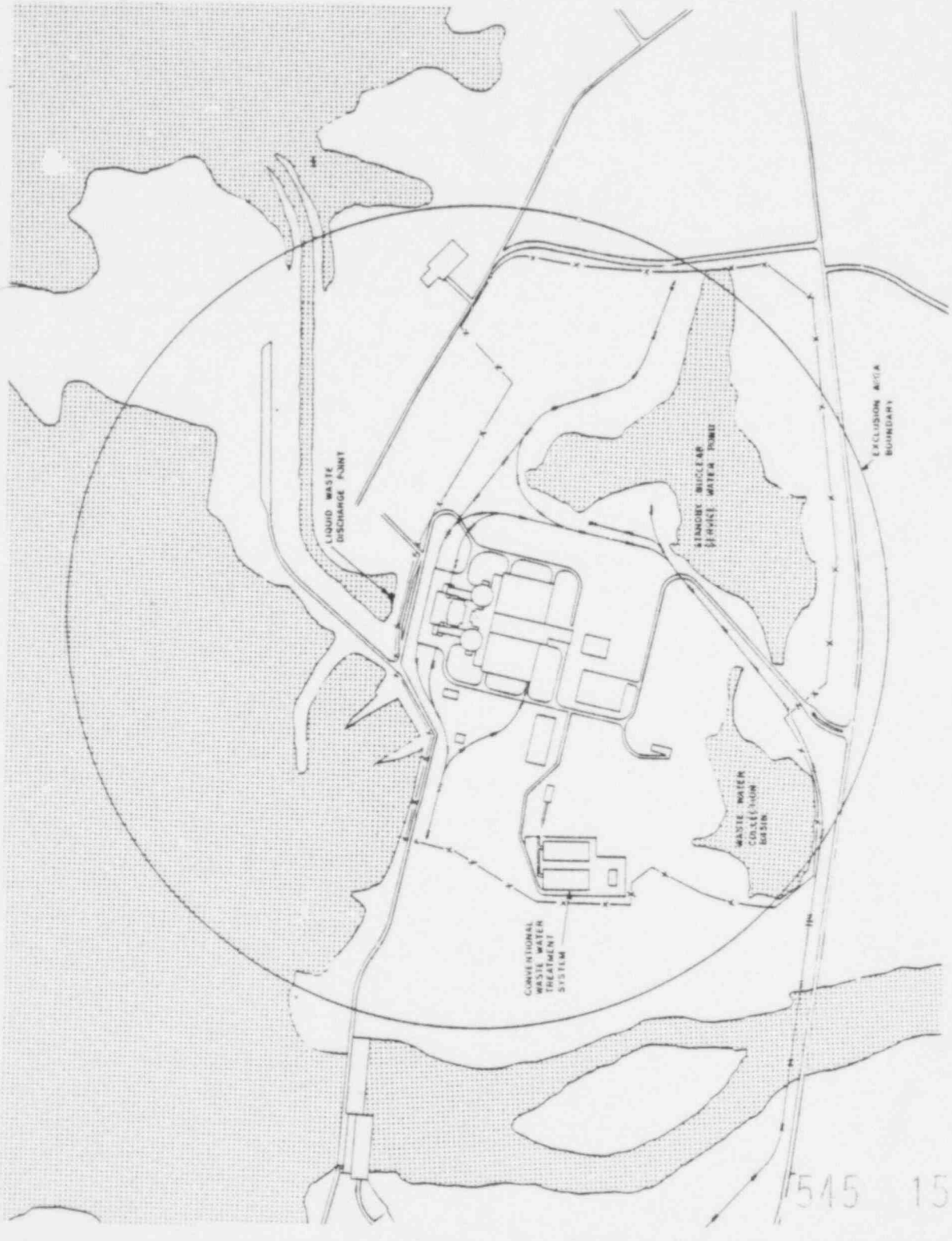
LOW POPULATION ZONE
McGUIRE NUCLEAR STATION

Figure 5.1-2



SITE BOUNDARY FOR
GASEOUS EFFLUENTS
McGUIRE NUCLEAR STATION

Figure 5.1-3



545 150

SITE BOUNDARY FOR
LIQUID EFFLUENTS
McGUIRE NUCLEAR STATION
Figure 5.1-4