

50-286
PROPOSED TECHNICAL SPECIFICATION CHANGES
RELATED TO RADIOLOGICAL EFFLUENTS
April 30, 1979
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ATTACHMENT I
PROPOSED TECHNICAL SPECIFICATION CHANGES
RELATED TO
RADIOLOGICAL EFFLUENTS

REGULATORY DOCKET FILE COPY

POWER AUTHORITY OF THE STATE OF NEW YORK
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
APRIL 30, 1979

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1.0 DEFINITIONS

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 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, where possible, comparison of the channel indication and/or status with other indications and/or status derived from independent instrumentation channel 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 OPERABILITY including alarm and/or trip functions.
- b. Bistable channels - the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions.

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

1.30 A PROCESS CONTROL PROGRAM (PCP) shall be the manual or set of operating procedures detailing the program of sampling, analysis, and evaluation within which the solidification of radioactive waste from liquid systems will be assured.

1.0 DEFINITIONS (Continued)

SOLIDIFICATION

1.31 SOLIDIFICATION as required by the Technical Specifications shall be the conversion of radioactive wastes from liquid systems to an 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 An OFFSITE DOSE CALCULATION MANUAL (ODCM) shall be a manual containing the methodology and parameters to be 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 a 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 absorbers and/or HEPA filters for the purpose of removing iodines or particulates from the gaseous exhaust stream prior to the release to the environment. Such a system is not considered to have any effect on noble gas effluent. Engineered Safety Feature (ESF) atmospheric cleanup systems are not considered to be VENTILATION EXHAUST TREATMENT SYSTEM components.

TABLE 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	Prior to each release.
N.A.	Not applicable.

INSTRUMENTATION

RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.8 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.3-11 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.1.1 are not exceeded.

APPLICABILITY: As shown in Table 3.3-11.

ACTION:

- a. With a radioactive liquid effluent monitoring instrumentation channel alarm/trip setpoint less conservative than a value which will ensure that the limits of 3.11.1.1 are met, 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 3.3-11.
- c. With one or more radioactive liquid effluent monitoring instrumentation channels inoperable beyond the continuation period specified in the applicable ACTION statement, prepare and submit to the Commission within 24 hours after the ACTION limit, pursuant to Specification 6.9.2, a Special Report, in lieu of any other report, which identifies the cause(s) for exceeding the limit(s), defines corrective actions to be taken to restore operability, and provides an estimated date for return to OPERABLE status of the instrumentation channel(s). Effluent releases via this pathway may continue beyond the ACTION time limit subject to the analysis and monitoring conditions of the applicable ACTION statement.

SURVEILLANCE REQUIREMENTS

4.3.3.8.1 The setpoints shall be determined and recorded in accordance with procedures.

4.3.3.8.2 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 during the MODES and at the frequencies shown in Table 4.3-11.

4.3.3.8.3 Records - Records shall be maintained, in accordance with the ODCM, of all radioactive liquid effluent monitoring instrumentation alarm/trip setpoints. Setpoints and setpoint calculations shall be available for review to ensure that the limits of Specification 3.11.1.1 are met.

BASES

3/4.3.3.8 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 methods in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The OPERABILITY and use of this instrumentation is consistent with the requirements General Design Criteria 60, 63 and 64 of Appendix A to 10 CFR Part 50.

TABLE 3.3-11

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABILITY</u>	<u>ACTION</u>
1. Gross Radioactivity Monitors Providing Automatic Termination of Release			
a. Liquid Radwaste Effluent Line	1	(1)	18
b. Steam Generator Blowdown Effluent Line	1	(1)	20

TABLE 3.3-11 (Continued)

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABILITY</u>	<u>ACTION</u>
2. Flow Rate Measurement Indicators & Recorders**			
a. Liquid Radwaste Effluent Line	1	(1)	21
b. Steam Generator Blowdown Effluent Line	1	(1)	21
3. Radioactivity Recorders***			
a. Liquid Radwaste Effluent Line	1	(1)	23
b. Steam Generator Blowdown Effluent Line	1	(1)	23
4. Tank Level Indicating Devices (for tanks outside plant buildings)			
a. Refueling Water Storage Tank	1	(1)	22
b. Primary Water Storage Tank	1	(1)	22
c. Monitor Tank 31	1	(1)	22
d. Monitor Tank 32	1	(1)	22

**Pump curves may be utilized to estimate flow or limiting orifice; in such cases, action statement 21 is not required.

***Required only if alarm/trip set point is based on recorder-controller.

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TABLE 3.3-11
(Continued)

TABLE NOTATION

- (1) During release by the pathway. CHANNELS shall be OPERABLE and in service during such releases on a continuous, uninterrupted basis, except that outages are permitted, within the time frame of the specified ACTION, for the purpose of maintenance and performance of required tests, checks, and calibrations.

ACTION 18 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases may be resumed 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;

Otherwise, suspend release of radioactive effluents via this pathway.

ACTION 20 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 14 days provided that at least once per 24 hours grab samples are collected and analyzed for gross radioactivity (beta or gamma) at a lower limit of detection of at least 10^{-7} uCi/ml.

ACTION 21 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 14 days provided the flow rate is estimated at least once per 4 hours during actual releases.

ACTION 22 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 28 days provided the tank liquid level is estimated.

1

ACTION 23 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 recorded at least once per 8 hours during actual release.

TABLE 4.3-11

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>SOURCE CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>
1. Gross Beta or Gamma Radioactivity Monitors Providing Alarm and Automatic Isolation				
a. Liquid Radwaste Effluent Line	D*	D*	R(3)	Q(1)
b. Steam Generator Blowdown	D*	M	R(3)	Q(1)
2. Gross Beta or Gamma Radioactivity Monitors Providing Alarm But Not Providing Automatic Isolation (4)				
a. Service Water System Effluent Line	D*	M	R(3)	Q(2)

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TABLE 4.3-11 (Continued)

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>SOURCE CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>
3. Activity Recorders (6)				
a. Liquid Radwaste Effluent Line	D*	N.A.	N.A.	N.A.
b. Steam Generator Blowdown Effluent Line	D*	N.A.	N.A.	N.A.
4. Tank Level Indicating Devices (for tanks outside the building) (7)				
a. Refueling Water Tank	D**	N.A.	R	Q
b. Primary Water Storage Tank	D**	N.A.	R	Q
c. Monitor Tank 31	D**	N.A.	R	Q
d. Monitor Tank 32	D**	N.A.	R	Q
5. Flow Rate Monitors/Recorders				
a. Liquid Radwaste Effluent Line	D ⁽⁵⁾	N.A.	N.A.	N.A.

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TABLE 4.3-11
(Continued)

TABLE NOTATION

*During releases via this pathway

**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:
 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.

- (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 for radioactivity measurement instrumentation shall be performed as recommended in Regulatory Guide 4.15 Revision 1, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment". The ODCM describes the established practice for monitor verification.

TABLE 4.3-11
(Continued)

- (4) This requirement is applicable only to systems where the service water system is discharged to an effluent stream.
- (5) 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.
- (6) This requirement is applicable only to systems where an alarm/trip action is performed by recorder-controller instrumentation.
- (7) This requirement is not applicable to tanks which have dikes or retention ponds capable of preventing runoff in the event of a tank overflow and have provisions for sampling collected liquids and routing them to a liquid radwaste treatment system.

INSTRUMENTATION

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.9 The radioactive gaseous 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 3.11.2.1 are not exceeded.

APPLICABILITY: As shown in Table 3.3-12.

ACTION:

- a. With a radioactive gaseous effluent monitoring instrumentation channel alarm/trip setpoint less conservative than a value which will ensure that the limits of 3.11.2.1 are met, declare the channel inoperable.
- b. With one or more radioactive gaseous effluent monitoring instrumentation channels inoperable, take the ACTION shown in Table 3.3-12.
- c. With one or more radioactive gaseous effluent monitoring instrumentation channels inoperable beyond the continuation period specified in the applicable ACTION statement, prepare and submit to the Commission within 24 hours after the ACTION limit, pursuant to Specification 6.9.2, a Special Report, in lieu of any other report, which identifies the cause(s) for exceeding the limits, defines corrective actions to be taken to restore operability, and provides an estimated date for return to OPERABLE status of the instrumentation channel(s). Effluent releases via this pathway may continue beyond the ACTION time limit subject to the analysis and monitoring conditions of the applicable ACTION statement.

SURVEILLANCE REQUIREMENTS

4.3.3.9.1 The setpoints shall be determined and recorded in accordance with procedures.

4.3.3.9.2 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 during the MODES and at the frequencies shown in Table 4.3-12.

4.3.3.9.3 Records shall be maintained of the calculations made, in accordance with procedures in the OCDM, of all radioactive effluent monitoring instrumentation alarm/trip setpoints. Setpoints and setpoint calculations shall be available for review to ensure that the limits of Specification 3.11.2.1 are met.

BASES

3/4.3.3.9 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 methods in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. This instrumentation also includes provisions for monitoring (and controlling) the concentrations of potentially explosive gas mixtures in the waste gas holdup system. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63 and 64 of Appendix A to 10 CFR Part 50.

TABLE 3.3-12

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABILITY</u>	<u>PARAMETER</u>	<u>ACTION</u>
1. Waste Gas Holdup System Explosive Gas Monitoring System				
a. Oxygen Monitor	1	**	% Oxygen	30
2. Plant Vent***				
a. Noble Gas Activity Monitor	1	*	Radioactivity Rate Measurement	27
b. Iodine Sampler Cartridge	1	*	Verify presence of cartridge	31
c. Particulate Sampler Filter	1	*	Verify presence of filter	31
d. Effluent System Flow Rate Measuring Device	1	*	System Flow Rate Measurement	26
e. Sampler Flow Rate Measuring Device	1	*	Sampler Flow Rate Measurement	26
3. Containment Monitor System				
a. Noble Gas Monitor (R 12)	1	*	Radioactivity Measurement	27
b. Particulate Monitor (R 11)	1	*	Radioactivity Measurement	27

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TABLE 3.3-12
(Continued)

TABLE NOTATION

*Channels shall be OPERABLE and in service on a continuous, uninterrupted basis during releases via this pathway, except that outages are permitted, within the time frame of the specified ACTION for the purpose of maintenance and performance of required tests, check and calibrations.

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

***This will also monitor releases from the vent header, auxiliary building vents, fuel storage building vents and the radwaste area vents. The condenser evacuation system is monitored continuously only as in this item 3a.

ACTION 26 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 28 days provided the flow rate is estimated at least once per 8 hours.

ACTION 27 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 28 days provided grab samples are taken at least once per 8 hours and these samples are analyzed for gross activity within 24 hours.

ACTION 28 (Deleted)

ACTION 30 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. Manual samples for O₂ once per watch will be acceptable when the process monitors are declared out of service.

TABLE 3.3-12
(Continued)

TABLE NOTATION

ACTION 31 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 28 days, provided samples are continuously collected with auxiliary sampling equipment for periods on the order of seven (7) days and analyzed within 48 hours of the end of sample collection.

TABLE 4.3-12

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>SOURCE CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>
1. Plant Vent				
a. Noble Gas Activity Monitor	D	W	R(3)	Q(1)
b. Iodine Sampler Cartridge & Particulate Filter	W	N.A.	R	N.A.
c. Particulate Activity Monitor	W	D	R(3)	Q(1)
d. System Effluent Flow Rate Measuring Device	W	N.A.	R	Q
2. Waste Gas Holdup System Explosive Gas Monitoring System				
a. Oxygen Monitor	N.A.	N.A.	M(4)	N.A.

TABLE 4.3-12 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>SOURCE CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>
3. Containment Purge Vent System				
a. Noble Gas Activity Monitor	D*	D*	R(3)	Q(1)
b. Particulate Activity Monitor	D*	D*	R(3)	Q(1)

TABLE 4.3-12
(Continued)

TABLE NOTATION

*Channels shall be OPERABLE and in service on a continuous, uninterrupted basis during releases via this pathway, except that outages are permitted, within the time frame of the specified ACTION for the purpose of maintenance and performance of required tests, check and calibrations.

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

***This will also monitor releases from the vent header, auxiliary building vents, fuel storage building vents and the radwaste area vents. The condenser evacuation system is monitored continuously only as in this item 3a.

- (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:
 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 for radioactivity measurement instrumentation shall be performed as recommended in Regulatory Guide 4.15 Revision 1, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment". The ODCM describes the established practice for monitor verification. (Existing plants may substitute previously established calibration procedures for this requirement.)

TABLE 4.3-12
(Continued)

- (4) 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, 76% nitrogen, 20% hydrogen.

3/4.11 RADIOACTIVE EFFLUENTS

3/4.11.1 LIQUID EFFLUENTS

CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.11.1.1 The concentration of radioactive liquid effluent released from the site to unrestricted areas (see Figure 3.11-1) as calculated under 20.106a, shall be limited to the concentrations specified in 10 CFR Part 20.

APPLICABILITY. At all times.

ACTION:

- a. With the concentration of radioactive material released from the site to unrestricted areas exceeding the above limits, take action to restore concentration within the above limits and provide prompt notification to the Commission pursuant to Specification 6.9.1.12.

SURVEILLANCE REQUIREMENTS

4.11.1.1.1 The concentration of radioactive material at any time in liquid effluents released from the site shall be continuously monitored in accordance with Table 3.3-11.

4.11.1.1.2 The liquid effluent continuous monitors having provisions for automatic termination of liquid releases, as listed in Table 3.3-11, shall be used to limit the concentration of radioactive material released at any time from the site to unrestricted areas to the values given in Specification 3.11.1.1.

4.11.1.1.3 The radioactivity content of each batch of radioactive liquid waste to be discharged from the site 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 limited to the values in Specification 3.11.1.1.

4.11.1.1.4 Post-release analyses of samples from batch releases shall be performed in accordance with Table 4.11-1. The results of the post-release analyses shall be used with the calculational methods in the ODCM to assure that the concentrations at the point of release were limited to the values in Specification 3.11.1.1.

SURVEILLANCE REQUIREMENTS (Continued)

4.11.1.1.5 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 limited to the values in Specification 3.11.1.1.

4.11.1.1.6 Reports. The semiannual Radioactive Effluent Release Report shall include the information specified in Specification 6.9.1.9.

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. This limitation provides additional assurance that the levels of radioactive materials in bodies of water outside the site will not 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.

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) (uCi/ml) ^a
A. Batch Waste Release Tanks ^e	P Each Batch	P Each Batch	Principal Gamma Emitters ^{g,h}	5×10^{-7b}
	P Each Batch	W Composite	I-131	1×10^{-6}
	P One Batch/M	M	Dissolved and Entrained Gases	1×10^{-5}
	P Each Batch	M Composite ^c	H-3 Gross alpha P-32*	1×10^{-5} 1×10^{-7} 1×10^{-6}
	P Each Batch	Q Composite ^c	Sr-89, Sr-90 Fe-55*	5×10^{-8} 1×10^{-6}
B. Plant Continuous Releases ^f	Continuous ^d	W Composite ^d	Principal Gamma Emitters ^g I-131	5×10^{-7b} 1×10^{-6}
	M Grab Sample	M	Dissolved and Entrained Gases	1×10^{-5}
	Continuous ^d	M Composite ^d	H-3 Gross alpha P-32*	1×10^{-5} 1×10^{-7} 1×10^{-6}
	Continuous ^d	Q Composite ^d	Sr-89, Sr-90 Fe-55*	5×10^{-8} 1×10^{-6}

TABLE 4.11-1 (Continued)

TABLE NOTATION

*These analyses will be performed for a one-year period, and a decision made by the licensee as to the need to continue these analyses based on a review detailed in the Semi-annual Radioactive Effluent Release Report.

- 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 radio-chemical separation):

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

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 and time of counting.

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. For isotopic measurements using gamma spectroscopy, the background count rate is calculated from the background counts that are determined to be within + one full-width at half-maximum energy band about the energy of the gamma ray peak used for the quantitative analysis for that radionuclide. Typical values of L, V, Y, and Δt should be used in the calculation.

It should be recognized that the LLD is defined as a priori (before the fact) limit representing the capability of a measurement system and not an posteriori (after the fact) limit for a particular measurement.

- b. For certain radionuclides with low gamma yield or low energies, or for certain radionuclide mixtures, it may not be possible to measure radionuclides in concentrations near the LLD. Under these circumstances, the LLD may be increased inversely proportionally to the magnitude of the gamma yield (i.e., $5 \times 10^{-7}/I$, where I is the photon abundance expressed as a decimal fraction).
- c. 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.
- d. To be representative of the quantities and concentrations of radioactive materials in liquid effluents, samples shall be collected 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. Composite samplers must be engineered and backfit and will not be operational until September 1, 1981.
- e. A batch release is the discharge of liquid wastes of a discrete volume.
- f. 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. (i.e. steam generator during a primary to secondary leak)
- g. The principal gamma emitters for which the LLD specification will apply are exclusively 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 should not be reported as being present at the LLD level. When unusual circumstances result in LLD's higher than required, the reasons shall be documented in the semiannual Radioactive Effluent Release Report.
- h. When operational or other limitations preclude specific gamma radioiodine analysis in batch releases, the provisions of Regulatory Guide 1.21 (Revision 1) Appendix A Section B.1, may be followed. Refer to R.G. 1.21 Section C.4 and Appendix A, Section B.

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 each unit to unrestricted areas (see Figure 3.11-1) shall be limited:

- a. During any calendar quarter to \leq 1.5 mrem to the total body and to \leq 5 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, the licensee shall:
 1. Make an investigation to identify the causes for such release rates;
 2. Define and initiate a program of corrective action; and
 3. Report these actions in a Special Report to the appropriate NRC Regional Office, with a copy to the Director of Inspection and Enforcement, U.S. NRC, Washington, D.C. 20555, within 30 days from the end of the quarter during which such releases occurred, pursuant to Specification 6.9.2 together with the results of radiological analyses of any drinking water sources possibly subject to increases, above background, related to plant releases.

It is expected that the annual release of radioactive material in effluent from the unit can generally be maintained within the levels set forth as numerical guides for design objectives in Section II, 10CFR50, Appendix I.

At the same time, the licensee is permitted under 10CFR50, Appendix I, the flexibility of operation, compatible with considerations of health and safety, to assure that the public is provided a dependable source of power even under unusual operating conditions which may temporarily result in releases higher than such numerical guides for design objectives but still within levels that assure that the average population exposure is equivalent to small fractions of doses from natural background radiation. It is expected that in using this operational flexibility under unusual operating conditions, the licensee will exert his best efforts to keep levels of radioactive material in effluents within the numerical guides for design objectives.

SURVEILLANCE REQUIREMENTS

4.11.1.2.1 Dose Calculations. Cumulative dose contributions from liquid effluents shall be determined in accordance with the Offsite Dose Calculation Manual (ODCM) at least once per 31 days.

3/4.11.1.2 DOSE

This specification is provided to implement the requirements of Sections III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Condition for Operation implements the guides set forth in Section IV.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". 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 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 1.113, "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.

RADIOACTIVE EFFLUENTS

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.

RADIOACTIVE EFFLUENTS

LIQUID WASTE TREATMENT

LIMITING CONDITION FOR OPERATION

3.11.1.3 The liquid radwaste treatment system in use shall be OPERABLE. 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 releases to unrestricted areas (see Figure 3.11-1) will exceed the limits in 3.11.1.2.

APPLICABILITY: At all times during any quarter in which discharges to unrestricted areas of liquid effluents containing plant related effluents containing plant related radioactive materials occur or is expected.

ACTION:

- a. With radioactive liquid waste being discharged to the unrestricted area without treatment and in excess of the above limits, 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 includes the following information:
 1. Identification of equipment or subsystems not OPERABLE 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.

BASES

3/4.11.1.3 LIQUID WASTE TREATMENT

The OPERABILITY of the liquid radwaste treatment system components specified in the ODCM 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 A to 10 CFR Part 50 and design objective Section 11.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 in Section II.A of Appendix 1, 10 CFR Part 50, for liquid effluents.

RADIOACTIVE EFFLUENTS

3/4.11.2 GASEOUS EFFLUENTS

DOSE

LIMITING CONDITION FOR OPERATION

3.11.2.1 The dose in the unrestricted areas (see Figure 3.11-1) due to radioactive materials released in gaseous effluents from the site shall be limited to the following values:

- a. The dose limit for noble gases shall be ≤ 500 mrem/yr to the total body and ≤ 3000 mrem/yr to the skin, and
- b. The dose limit for all radioiodines and for all radioactive materials in particulate form, with half lives greater than 8 days, shall be ≤ 1500 mrem/yr to any organ.

APPLICABILITY: At all times.

ACTION:

- a) With the dose exceeding the above limits, decrease the release rate to comply with the limit(s) give in Specification 3.11.2.1 and provide prompt notification to the Commission pursuant to Specification 6.9.1.12.

SURVEILLANCE REQUIREMENTS

4.11.2.1.1 The noble gas effluent continuous monitors having provisions for the automatic termination of gaseous releases, as listed in Table 3.3-12, shall be used to limit offsite doses within the values established in Specification 3.11.2.1.a when monitor setpoint values are exceeded.

4.11.2.1.2 The release rate of radioactive materials, other than noble gases, in gaseous effluents shall be determined by obtaining representative samples and performing analyses in accordance with the sampling and analysis program, specified in Table 4.11-2.

SURVEILLANCE REQUIREMENTS

4.11.2.1.3 The dose in unrestricted areas, due to radioactive materials other than noble gases released in gaseous effluents, shall be determined to be within the required limits by using the results of the sampling and analysis program, specified in Table 4.11-2, in performing the calculations of dose in unrestricted areas.

4.11.2.1.4 Reports The semiannual Radioactive Effluent Release Report shall include the information specified in R.G. 1.21 Rev. 1

BASES

3/4.11.2 GASEOUS EFFLUENTS

3/4.11.2.1 DOSE

This specification is provided to ensure that the dose at the exclusion area 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. 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 exclusion area boundary, to annual average concentrations exceeding the limits specified in Appendix B, Table II of 10 CFR Part 20 (10 CFR Part 20.106(a)). For individuals who may at times be within the exclusion area boundary, the occupancy of the individual will be sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the exclusion area boundary. The specified release rate limits restrict the corresponding gamma and beta dose above background to an individual at or beyond the exclusion area boundary to \leq (500) mrem/year to the total body or to \leq (3000) mrem/year to the skin. These release rate limits also restrict the corresponding thyroid dose above background to an infant via the cow-milk-infant pathway to \leq 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.

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) (uCi/ml) ^a
A. Waste Gas Storage Tank	P Each Release Grab Sample	P Each Release	Principal Gamma Emitters ^f	1 x 10 ⁻⁴
			H-3*	1 x 10 ⁻⁶
B. Containment Purge Containment Pressure Reliefs (g)	P Each Purge Grab Sample	P Each Purge	Principal Gamma Emitters ^f	1 x 10 ⁻⁴
			H-3*	1 x 10 ⁻⁶
C. Plant vent	M Grab Sample	M ^e	Principal Gamma Emitters ^f	1 x 10 ⁻⁴
			H-3*	1 x 10 ⁻⁶
			I-131	1 x 10 ⁻¹²
			I-133	1 x 10 ⁻¹⁰
			Principal Gamma Emitters ^f	1 x 10 ⁻¹¹
Continuous ^e	W ^d Charcoal Sample	W ^e Particulate Sample	Principal Gamma Emitters ^f	1 x 10 ⁻¹¹
				1 x 10 ⁻¹¹
Continuous ^e	M Composite Particulate Sample	M	Gross alpha	1 x 10 ⁻¹¹
				1 x 10 ⁻¹¹
Continuous ^e	Q Composite Particulate Sample	Q	Sr-89, Sr-90	1 x 10 ⁻¹¹
D. Condenser Air Ejector	M Grab Sample	M	Principal Gaseous Gamma Emitters ^f	1 x 10 ⁻⁴

TABLE 4.11-2 (Continued)

TABLE NOTATION

- a. See footnote a. on Table 4.11-1.
- b. For certain radionuclides with low gamma yield or low energies, or for certain radionuclide mixtures, it may not be possible to measure radionuclides in concentrations near the LLD. Under these circumstances, the LLD may be increased inversely proportionally to the magnitude of the gamma yield (i.e., $1 \times 10^{-4}/I$, where I is the photon abundance expressed as a decimal fraction).
- d. Analyses shall also be performed at least once per 24 hours for 7 days following each refueling or similar operational occurrence which could lead to significant increases or decreases in radioiodine releases. When samples collected for 24 hours are analyzed, the corresponding LLD's may be increased by a factor of 10.
- e. The ratio of the sample flow rate to the sampled stream flow rate shall be known for the time period covered by each dose or dose rate calculation made in accordance with Specifications 3.11.2.1, 3.11.2.2 and 3.11.2.3.
- f. The principal gamma emitters for which the LLD specification will apply are exclusively 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 should not be reported as being present at the LLD level for that nuclide. When unusual circumstances result in LLD's higher than required, the reasons shall be documented in the semi-annual effluent report. The "less than" values shall not be used in the required dose calculations.
- g. The containment noble gas monitor (R-12) may be used to calculate the release rate.

*In lieu of grab samples, use of ASTM method D3442 "Test for Tritium Content of Air" can be used.

RADIOACTIVE EFFLUENTS

DOSE, NOBLE GASES

LIMITING CONDITION FOR OPERATION

3.11.2.2 The air dose in unrestricted areas (see Figure 3.11-1) due to noble gases released in gaseous effluents shall be limited to the following:

- a. During any calendar quarter, to \leq 5 mrad for gamma radiation and \leq 10 mrad for beta radiation;

APPLICABILITY: At all times.

ACTION:

- a. With the calculated dose from the release of radioactive materials in gaseous effluents exceeding the above limit, the licensee shall:
 1. Make an investigation to identify the causes for such release rates;
 2. Define and initiate a program of corrective action; and
 3. Prepare and submit to the Commission, within 30 days, pursuant to specification 6.9.2, a special report, in lieu of any other report, reporting these actions.

It is expected that the annual release of radioactive material in effluents from the unit can generally be maintained within the levels set forth as numerical guides for design objectives in Section II, 10CFR50, Appendix I.

At the same time, the licensee is permitted under 10CFR50, Appendix I, the flexibility of operation, compatible with considerations of health and safety, to assure that the public is provided a dependable source of power even under unusual operating conditions which may temporarily result in releases higher than such numerical guides for design objectives but still within levels that assure that the average population exposure is equivalent to small fractions of doses from natural background radiation. It is expected that in using this operational flexibility under unusual operating conditions, the licensee will exert his best efforts to keep levels of radioactive material in effluents within the numerical guides for design objectives.

SURVEILLANCE REQUIREMENTS

4.11.2.2.1 Dose Calculations Cumulative dose contributions for the total time period shall be determined in accordance with the Offsite Dose Calculation Manual (ODCM).

4.11.2.2.2 Reports The semiannual Radioactive Effluent Release Report shall include the information specified in Specification 6.9.1.9.

BASES

3/4.11.2.2 DOSE, NOBLE GASES

This specification is provided to implement the requirements of Sections III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Condition for Operation implements the guides set forth in Section IV.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 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 unrestricted area boundary will be based upon the historical average atmospheric conditions.

RADIOACTIVE EFFLUENTS

DOSE, RADIOIODINES AND RADIOACTIVE MATERIAL IN PARTICULATE FORM

LIMITING CONDITION FOR OPERATION

3.11.2.3 The dose to an individual from radioiodines and radioactive materials in particulate form, with half-lives greater than 8 days, in gaseous effluents released to unrestricted areas (see Figure 3.11-1) shall be limited to the following:

- a. During any calendar quarter to \leq 7.5 mrem to any organ.

APPLICABILITY: At all times.

ACTION:

- a. With the calculated dose from the release of radioiodines and radioactive materials in particulate form in gaseous effluents exceeding any of the above limits, the licensee shall:
 1. Make an investigation to identify the causes for such release rates;
 2. Define and initiate a program of corrective action; and
 3. Prepare and submit to the Commission, within 30 days, pursuant to specification 6.9.2, a special report, in lieu of any other report, reporting these actions.

It is expected that the annual release of radioactive material in effluents from the unit can generally be maintained within the levels set forth as numerical guides for design objectives in Section II, 10CFR50, Appendix I.

At the same time, the licensee is permitted under 10CFR50, Appendix I, the flexibility of operation, compatible with considerations of health and safety, to assure that the public is provided a dependable source of power even under unusual operating conditions which may temporarily result in releases higher than such numerical guides for design objectives but still within levels that assure that the average population exposure is equivalent to small fractions of doses from natural background radiation. It is expected that in using this operational flexibility under unusual operating conditions, the licensee will exert his best efforts to keep levels of radioactive material in effluents within the numerical guides for design objectives.

SURVEILLANCE REQUIREMENTS

4.11.2.3.1 Dose Calculations Cumulative dose contributions for the total time period shall be determined in accordance with the ODCM at least once every 31 days.

4.11.2.3.2 Reports The semiannual Radioactive Effluent Release Report shall include the information specified in Specification 6.9.1.9.

BASES

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 III.A and IV.A of Appendix I, 10 CFR Part 50. The Limiting Conditions for Operation are the guides set forth in Section IV.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 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 approved by NRC 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 Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," Revision 1, July 1977. These equations also provide for determining the actual doses based upon the historical average atmospheric conditions. The release rate specifications for radioiodines and radioactive material in particulate form are dependent on the existing radionuclide pathways to man, in the unrestricted area. The pathways which are examined in the development of these calculations are: 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.

RADIOACTIVE EFFLUENTS

GASEOUS RADWASTE TREATMENT

LIMITING CONDITION FOR OPERATION

3.11.2.4 The components of the GASEOUS RADWASTE TREATMENT SYSTEM and the VENTILATION EXHAUST TREATMENT SYSTEM as identified in the ODCM shall be OPERABLE. 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 to unrestricted areas exceed the limits in 3.11.2.2 and/or 3.11.2.3.

APPLICABILITY: At all times.

ACTION:

- a. With gaseous waste being discharged for more than 31 days without treatment and in excess of the above limits, prepare and submit to the Commission within 31 days, pursuant to Specification 6.9.2, a Special Report in lieu of any other report which includes the following information:
 1. Identification of equipment of subsystems not OPERABLE 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.

SURVEILLANCE REQUIREMENTS

4.11.2.4.1 Doses due to gaseous releases to unrestricted areas shall be calculated at least once per 6 months.

4.11.2.4.2 The appropriate systems shall be demonstrated OPERABLE at least once per 92 days unless the appropriate system has been utilized to process radioactive gaseous effluents during the previous 92 days.

BASES

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 10CFR Part 50. The specified limits governing the use of appropriate portions of the systems were specified as a suitable fraction of the guide set forth in Sections II.B and II.C of Appendix I, 10 CFR Part 50, for gaseous effluents.

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RADIOACTIVE EFFLUENTS

EXPLOSIVE GAS MIXTURE

LIMITING CONDITION FOR OPERATION

3.11.2.6 The concentration of oxygen in the waste gas holdup system shall be limited to $\leq 4\%$ by volume oxygen.

APPLICABILITY: At all times.

ACTION:

- a. With the concentration of oxygen in the waste gas holdup system $> 4\%$ by volume, restore the concentration of hydrogen or oxygen to the limit within 48 hours.
- b. With the concentration of oxygen in the waste gas holdup system $> 5\%$ by volume, immediately suspend all additions of waste gases to the system and reduce the concentration of oxygen to $\leq 4\%$ within 48 hours.

SURVEILLANCE REQUIREMENTS

4.11.2.6B The concentrations of oxygen in the waste gas holdup system shall be determined to be within the above limits by monitoring the waste gases in the waste gas holdup system with the oxygen monitor required OPERABLE by Table 3.3-12 of Specification 3.3.3.9 or by analysis of grab samples as indicated by Table 3.3-12 of Specification 3.3.3.9.

BASES

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. Maintaining the concentration of oxygen below 4% 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.

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 < 6000 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, suspend all additions of radioactive material to the tank and within 48 hours either reduce the tank contents to within the limit or provide prompt notification to the Commission pursuant to Specification 6.9.1.12. The written followup report shall include a description of activities planned and/or taken to reduce the tank contents to within the above limit.

SURVEILLANCE REQUIREMENTS

4.11.2.7 The quantity of radioactive material contained in each isolated 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.

BASES

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."

RADIOACTIVE EFFLUENTS

3/4.11.3 SOLID RADIOACTIVE WASTE

LIMITING CONDITION FOR OPERATION

3.11.3.1 The solid radwaste system as described in the PROCESS CONTROL PROGRAM shall be OPERABLE and used to provide for the SOLIDIFICATION and packaging of radioactive wastes to ensure meeting the requirements of 10CFR Part 20 and of 10CFR Part 71 prior to shipment of radioactive waste from the site.

APPLICABILITY: At all times.

ACTION:

- a. With the requirements of the PROCESS CONTROL PROGRAM of Specification 6.14 not satisfied, suspend defectively packaged shipments of solid radioactive wastes from the site.

SURVEILLANCE REQUIREMENTS

4.11.3.1.1 The solid radwaste system shall be demonstrated OPERABLE at least once per 92 days, or there be the capability for SOLIDIFICATION of waste by meeting one or more of the conditions below:

SURVEILLANCE REQUIREMENTS (Continued)

- a. By performance of functional tests of the equipment and components of the solid radwaste system.
- b. By operating the solid radwaste system at least once in the previous 92 days in accordance with the PROCESS CONTROL PROGRAM.
- c. Verification of the existence of a valid contract for SOLIDIFICATION to be performed in accordance with a PROCESS CONTROL PROGRAM.

4.11.3.1.2 The PROCESS CONTROL PROGRAM of Specification 6.14 shall be used to verify the SOLIDIFICATION of at least one representative test specimen from at least every hundredth batch of each type of wet radioactive waste (e.g., filter sludges, spent resins, evaporator bottoms, boric acid solutions, sodium sulfate solutions, and filter media). The test specimens shall be processed in the radiochemical or waste processing laboratory in accordance with procedures of the PROCESS CONTROL PROGRAM.

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

4.11.3.1.3 Reports - The semiannual Radioactive Effluent Release Report shall include the following information for each type of solid waste shipped offsite during the report period:

- a. container volume,
- b. total curie quantity (determined by measurement or estimate),

SURVEILLANCE REQUIREMENTS (Continued)

- c. principal radionuclides (determined by measurement or estimate),
- d. type of waste (e.g., spent resin, compacted dry waste evaporator bottoms),
- e. type of container (e.g., LSA, Type A, Type B, Large Quantity), and
- f. solidification agent (e.g., cement, urea formaldehyde).

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.