SOUTH CAROLINA ELECTRIC & GAS COMPANY
POST OFFICE BOX 764
COLUMBIA, S. C. 29218

Nuclear Operations

July 6, 1981

Mr. Ed. Weinkam
Office of Nuclear Reactor Regulations
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: V. C. Summer Nuclear Station
Docket No. 50/395
Technical Specifications

Dear Ed:

Attached is our proposed revision to your latest draft (March 10, 1981) of the Technical Specifications for the V. C. Summer Nuclear Station. Most of the changes are to the environmental part of the Specifications and are necessary to apply to our plant design. Explanation for each change is as follows:

Page	Explanation
3/4 3-10	The $\leq$2.0 second response is based on lead-lag circuit set at zero. The Surveillance Test will be performed with the lead/lag circuit functioning normally. The correct response time for normal lead/lag compensation is $\leq$4.0 seconds.
3/4 3-41	Notations for the plant radiation monitors were incorrect. Range for RM-G7 is different from RM-G18 and there are no alarm/trip setpoints.
3/4 3-41a	In this Table only the high range monitors have been listed. The condenser exhaust and auxiliary building exhaust both are exhausted through the main plant vent. We do not monitor steam safety valves, relief valves or atmospheric steam dump valves but do monitor each steam line upstream of these valves.

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3/4 3-43 & 3-43a	Items in this Table were changed to correspond to the items in Table 3.3-6.
3/4 3-65	Typographical errors.
3/4 3-66	Adding additional information. Condensate demineralizer effluent was eliminated because this effluent will be batched and released in accordance with Specification 3.11.1.5. There are no flow rate measuring devices on the penstocks or the circulating water discharge canal. These flows will be conservatively estimated from head curves.
3/4 3-67	Clarification of reason for action.
3/4 3-68	These ACTIONS are no longer referred to by the Table.
3/4 3-69	Items were changed to correspond to the items in Table 3.3-12.
3/4 3-70	CHANNEL FUNCTIONAL TESTS were changed to describe installed instrumentation.
3/4 3-72	On each recombiner there is a H_2 and O_2 monitor upstream and a H_2 and O_2 monitor downstream. The condenser air removal effluent has been omitted because this effluent goes out the plant vent.
3/4 3-73	The sampler flow rate for the plant vent is monitored.
3/4 3-74	ACTION 40 was changed for clarification.
3/4 3-75 & 3-76	Items of this Table were changed to correspond to the items in Table 3.3-13.
3/4 3-77	CHANNEL FUNCTIONAL TESTS were changed to describe installed instrumentation. Notes 4 and 5 were combined due to the way the monitors are described in the Table.
3/4 4-17	The radiation monitor notation was added for clarity.

3/4 4-35	Error
3/4 11-2	The waste from our condensate dimineralizers will be batched and discharged in accordance with Specification 3.11.1.5 or shipped to a low radwaste burial ground.
3/4 11-3	The note has been added for clarity. If no radioactivity can be measured, it will be assumed that there is none present.
3/4 11-4	We will composite grab samples on the steam generator blowdown and turbine building sump rather than continuously sample.
3/4 11-7	This change is to better define the outside storage tanks that will be covered by this Specification.
3/4 11-8	The slurry volume to resin weight ratio cannot be assumed to be constant at 100 milliliters/gram as stated in the bases. However, with these changes to the Specification, the release will still be in accordance with Appendix I.
3/4 11-9	See Explanation for 3/4 11-8.
3/4 11-11	The main condenser air removal system has been deleted since this discharges through the main plant vent. Item E of this Table has been eliminated because the noble gas radiation monitors do not belong in this Table since they are listed in Table 3.3-13 and Surveillance 4.11.2.1.2 excludes nobel gases.
3/4 11-12	See explanation for change on Page 3/4 11-3.
3/4 11-13	These changes are to clarify the notation in the Table.
3/4 11-16	These limits were changed to be consistent with 3.11.2.2.
3/4 11-18	During normal operation without failed fuel the amount of radioactive materials being added to the tank is not sufficient to justify analysis every 24 hours. However, in the event of failed fuel the quality of radioactive material in a tank will be determined each day when radioactive materials have been added to the tank.

3/4 12-3 thru 12-12	These changes update this table to the current environmental monitoring program.
B 3/4 11-2 & 11-3	See Explanation for 3/4 11-8.
5-1	The reactor building is a prestressed-posttensioned reinforced concrete structure.
Figure 5.1-4	Mispelled.
6-3	New plant organization chart to reflect recent changes. The major changes are that now the Health Physics Supervisor, QC Inspection Coordinator, and the Nuclear Training Coordinator report directly to plant management.

Should you have questions concerning these changes, please call me at 803-748-3299.

Sincerely,

Leland Shealy

Leland Shealy

LS:fp
Attachment

CC: A. R. Koon

TABLE 3.3-2

REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME
1. Manual Reactor Trip	Not Applicable
2. Power Range, Neutron Flux	≤ 0.5 seconds*
3. Power Range, Neutron Flux, High Positive Rate	Not Applicable
4. Power Range, Neutron Flux, High Negative Rate	≤ 0.5 seconds*
5. Intermediate Range, Neutron Flux	Not Applicable
6. Source Range, Neutron Flux	Not Applicable
7. Overtemperature ΔT	≤ 4.0 ~~2.0~~ seconds*
8. Overpower ΔT	Not Applicable
9. Pressurizer Pressure--Low	≤ 2.0 seconds
10. Pressurizer Pressure--High	≤ 2.0 seconds
11. Pressurizer Water Level--High	Not Applicable

*Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input of first electronic component in channel.

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TABLE 3.3-6

RADIATION MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	MEASUREMENT RANGE	ACTION
1. AREA MONITORS					
a. Spent Fuel Pool Area (~~RMG-8~~ RM-G8)	1	*	≤ 15 mR/hr	10^{-1} - 10^{4} mR/hr	23
b. Reactor Building Manipulator Crane Area (~~RMG-17A~~ c 17B) (RM-G17A)	1	6	≤ 1 R/hr	1 - 10^{5} mr/hr	26
c. Reactor Building Area	~~2~~	~~1, 2, 3 & 4~~	≤ ( ) rad/hr	1 - 10^{8} rad/hr	28
2. PROCESS MONITORS					
i. High Range RM-G7	1	1, 2, 3 & 4	N/A	$10-10^{8}$ R/hR	28
ii. High Range RM-G18	1	1, 2, 3 & 4	N/A	$1-10^{7}$ R/hR	28
a. Spent Fuel Pool Exhaust - Ventilation System (~~RMA-6~~ RM-A6)					
i. Gaseous Activity	1	**	≤ 1 x 10^{-5} μCi/cc (Kr-85)	10 - 10^{6} cpm	25
ii. Particulate Activity	1	**	~~≤ 2 x background~~ N/A	10 - 10^{6} cpm	25
b. Containment					
i. Gaseous Activity - Purge & Exhaust Isolation (~~RMA-4~~ RM-A4)	1	6	≤ 2 x background***	10 - 10^{6} cpm	26
ii. Particulate Activity (~~RMA-2~~ RM-A2) - RCS Leakage Detection	1	1, 2, 3 & 4	N/A	10 - 10^{6} cpm	24
c. Control Room Isolation (RM-A1)	1	ALL MODES	≤ 2 x background	10 - 10^{6} cpm	27

* With fuel in the storage pool or building

** With irradiated fuel in the storage pool

*** Alarm/trip setpoint will be per the Operational Dose Calculation Manual when purge exhaust operations are in progress

TABLE 3.3-6 (Continued)

RADIATION MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	MEASUREMENT RANGE	ACTION
PROCESS MONITORS (Continued)					
d. Noble Gas Effluent Monitors (High Range)					
~~i. Radwaste Building Exhaust System~~	~~1~~	~~1, 2, 3 & 4~~	~~( ) rad/hr~~	~~$1-10^2$ uCi/cc~~	~~28~~
~~ii. Auxiliary Building Exhaust System~~ (RM-A13) Main Plant Vent	1	1, 2, 3 & 4	~~( )~~ N/A ~~rad/hr~~	~~$1-10^3$ uCi/cc~~ $0.1-10^7$ MR/hr	28
~~iii. Steam Safety Valve Discharge~~ Main Steam Lines (RM-G19A,B,C)	1/valve Steam Line	1, 2, 3 & 4	~~( )~~ N/A ~~rad/hr~~	~~$1-10^3$ uCi/cc~~ $0.1-10^7$ MR/hr	28
~~iv. Atmospheric Steam Dump Valve Discharge~~	~~1 valve~~	~~1, 2, 3 & 4~~	~~( ) rad/hr~~	~~$1-10^3$ uCi/cc~~	~~28~~
~~v.~~ Reactor Building Purge Supply & Exhaust System (RM-A14)	1	1, 2, 3 & 4	~~( )~~ N/A ~~rad/hr~~	~~$1-10^5$ uCi/cc~~ $0.1-10^7$ MR/hr	28
~~vi. Condenser Exhaust System~~	~~1~~	~~1, 2, 3 & 4~~	~~( ) rad/hr~~	~~$1-10^5$ uCi/cc~~	~~28~~

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THIS SHEET PERTAINS TO RECEIPT OF INFORMATION BY THE APPLICANT

TABLE 4.3-3

RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. AREA MONITORS				
a. Spent Fuel Pool Area (~~RMG-8~~ Rm-68)	S	R	M	*
b. Reactor Building Manipulator Crane Area (~~RMG-17A or 17B~~ Rm-5)	S	R	M	6
c. ~~Reactor Building Area~~ (c. High Range Rm-67)	~~S~~ S	~~R~~ R	~~M~~ M	~~1, 2, 3 & 4~~ 1, 2, 3 & 4
2. PROCESS MONITORS (c. High Range Rm-68)	S	R	M	1, 2, 3 & 4
a. Spent Fuel Pool Exhaust Area - Ventilation System (~~RMA-5~~ Rm-42)				
i. Gaseous Activity	S	R	M	**
ii. Particulate Activity	S	R	M	**
b. Containment				
i. Gaseous Activity - Purge & Exhaust Isolation (~~RMA-4~~ Rm-44)	S	R	M	6
ii. Particulate Activity - RCS Leakage Detection (~~RMA-2~~ Rm-42)	S	R	M	1, 2, 3 & 4
c. Control Room Isolation (Rm-41)	S	R	M	All MODES

*With fuel in the storage pool or building
**With irradiated fuel in the storage pool

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TABLE 4.3-3 (Continued)

RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
PROCESS MONITORS (Continued)				
c. Noble Gas Effluent Monitors (High Range)				
~~i. Radwaste Building Exhaust System~~	S	R	M	1, 2, 3 & 4
~~ii. Auxiliary Building Exhaust System~~ Main Plant Vent (RM-A13)	S	R	M	1, 2, 3 & 4
~~iii. Steam Safety Valve Discharge~~ Main Steam Lines (RM-G19A, B, C)	S	R	M	1, 2, 3 & 4
~~iv. Atmospheric Steam Dump Valve Discharge~~	S	R	M	1, 2, 3 & 4
v. Reactor Building Purge Supply & Exhaust System (RM-A14)	S	R	M	1, 2, 3 & 4
~~vi. Condenser Exhaust System~~	S	R	M	1, 2, 3 & 4

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INSTRUMENTATION
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RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.8 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 less than the minimum number of radioactive liquid effluent monitoring instrumentation channels OPERABLE, 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

4.3.3.8 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 4.3-8.

Note: This Page Contains MANY Typo's as shown above.

TABLE 3.3-12

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	ACTION
1. GROSS RADIOACTIVITY MONITORS PROVIDING AUTOMATIC TERMINATION OF RELEASE		
a. Liquid Radwaste Effluent Line - RM-L5 OR RM-L9	1	28 33
b. Steam Generator Blowdown Effluent Line		
1. Unprocessed ~~during Power Operation~~ - RM-L10 OR RM-L3	1	29
~~2. Unprocessed during Startup - RM-L3~~	~~1~~	~~29~~
2.3. Processed - RM-L7 OR RM-L9	1	34 29
c. Turbine Room Sump Effluent Line - RM-L8	1	30
~~d. Condensate Demineralizer Effluent Line - RM-L(?)~~	~~1~~	~~28~~
2. FLOW RATE MEASUREMENT DEVICES		
a. Liquid Radwaste Effluent Line	1	31
~~b. Discharge Canal (Penstocks)~~	~~1~~	~~31~~
~~c. Circulating Water Discharge Canal~~	~~1~~	~~31~~
b. d. Steam Generator Blowdown Effluent Line		
1. Unprocessed ~~during Power Operation~~	1	31
~~2. Unprocessed during Startup~~	~~1~~	~~31~~
3. Processed	1	31
~~e. Condensate Demineralizer Effluent Line~~	~~1~~	~~31~~
3. TANK LEVEL INDICATING DEVICES		
a. Condensate Storage Tank	(1)	32

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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:

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

b. At least two technically qualified members of the Facility Staff independently verify the release rate calculations and discharge line valving;

Otherwise, suspend release of radioactive effluents via this pathway.

ACTION 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} microcuries/gram:

a. At least once per 8 hours when the specific activity of the secondary coolant is greater than 0.01 microcuries/gram DOSE EQUIVALENT I-131.

b. At least once per 24 hours when the specific activity of the secondary coolant is less than or equal to 0.01 microcuries/gram DOSE EQUIVALENT I-131.

ACTION 30 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 30 days provided that, at least once per 8 hours, grab samples are collected and analyzed for gross radioactivity (beta or gamma) at a limit of detection of at least 10^{-7} microcuries/ml.

ACTION 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 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.

ACTION 32 - With the number 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, to present over 30.

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TABLE 3.3-12 (Continued)

TABLE NOTATION

ACTION 33 - 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 Liquid Waste Effluent Monitor RM-L9 is OPERABLE or prior to initiating a release:

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

b. At least two technically qualified members of the facility staff independently verify the release rate calculati... and discharge line valving.

Otherwise, suspend release of radioactive effluents via this pathway.

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ACTION 34 - 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 Liquid Waste Effluent Monitor RM-L9 is OPERABLE or grab samples are analyzed for gross radioactivity (beta or gamma) at a limit of detection of at least 10^{-7} microcuries/gm:

a. At least once per 8 hours when the specific activity of the secondary coolant is greater than 0.01 microcuries/gm DOSE EQUIVALENT I-131.

b. At least once per 24 hours when the specific gravity of the secondary coolant is less than or equal to 0.01 microcuries/gm DOSE EQUIVALENT I-131.

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TABLE 4.3-8

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 TERMINATION OF RELEASE				
a. Liquid Radwaste Effluents Line - RM-L5, RM-L9	D	P	R(3)	Q(1)
b. Steam Generator Blowdown Effluent Line - RM-L3, RM-L7, RM-L10	D	M	R(3)	Q(1)
c. Turbine Room (Floor Drains) Sump Effluent Line - RM-L8	D	M	R(3)	Q(1)
~~d. Condensate Demineralizer Effluent Line - RM-L(?)~~	~~D~~	~~P~~	~~R(3)~~	~~Q(1)~~
2. FLOW RATE MEASUREMENT DEVICES				
a. Liquid Radwaste Effluent Line - ~~RM-L5, RM-L9~~	D(4)	N.A.	R	Q
b. Steam Generator Blowdown Effluent Line - ~~RM-L3, RM-L7, RM-L10~~	D(4)	N.A.	R	Q
~~c. Discharge Canal (Penstocks)~~	~~D(4)~~	~~N.A.~~	~~R~~	~~Q~~
~~d. Circulating Water Discharge Canal~~	~~D(4)~~	~~N.A.~~	~~R~~	~~Q~~
~~e. Condensate Demineralizer Effluent Line~~	~~D(4)~~	~~N.A.~~	~~R~~	~~Q~~
3. TANK LEVEL INDICATING DEVICES				
a. Condensate Storage Tanks	D*	N.A.	R	Q

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TABLE 4.3-8 (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 exists:

1. Instrument indicates measured levels above the alarm/trip setpoint.

~~2. Circuit failure.~~

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

3 ~~4.~~ Instrument controls not set in operate mode. (i.e. power on)

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

1. Instrument indicates measured levels above the alarm setpoint.

~~2. Circuit failure.~~

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

3 ~~4.~~ Instrument controls not set in operate mode. (i.e. power on)

(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.

(4) CHANNEL CHECK shall consists of verifying indication of flow during periods of release. CHANNEL CHECK shall be made at least once per 24 hours on days on which continuous, periodic, or batch releases are made.

TABLE 3.3-13

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
1. GASEOUS WASTE PROCESSING SYSTEM			
a. Noble Gas Activity Monitor - Providing Alarm and Automatic Termination of Release - RM-A10 OR RM-A3	1	*	35
2. WASTE GAS HOLDUP SYSTEM EXPLOSIVE GAS MONITORING SYSTEM			
a. Oxygen Monitors (two downstream and Hydrogen Monitor upstream of recombiner)	1/recombiner	**	40
b. Oxygen Monitor and Hydrogen Monitor (upstream Downstream of recombiner)	1/recombiner	**	40
~~3. CONDENSER AIR REMOVAL SYSTEM~~			
~~a. Noble Gas Activity Monitor - RM-A9~~	~~1~~	~~*~~	~~37~~
~~b. Iodine Sampler~~	~~1~~	~~*~~	~~41~~
~~c. Particulate Sampler~~	~~1~~	~~*~~	~~41~~
~~d. Flow Rate Measuring Service~~	~~1~~	~~*~~	~~36~~
~~e. Sampler Flow Rate Monitor~~	~~1~~	~~*~~	~~36~~
3 4. REACTOR BUILDING PURGE SYSTEM			
a. Noble Gas Activity Monitor - Providing Alarm and Automatic Termination of Release - RM-A4	1	*	38
b. Iodine Sampler	1	*	41

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TABLE 3.3-13 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

	INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
3 ~~4.~~	REACTOR BUILDING PURGE SYSTEM (continued)			
	c. Particulate Sampler	1	*	41
	d. Flow Rate Measuring Device	1	*	36
	e. Sampler Flow Rate Monitor	1	*	36
4 ~~5.~~	MAIN PLANT VENT EXHAUST SYSTEM			
	a. Noble Gas Activity Monitor - RM-A3	1	*	37
	b. Iodine Sampler	1	*	41
	c. Particulate Sampler	1	*	41
	d. Flow Rate Measuring Device	1	*	36
	e. Sampler Flow Rate ~~Measuring Device~~ Monitor	1	*	36

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TABLE 3.3-13 (Continued)

TABLE NOTATION

* At all times. during releases via this pathway.

** 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:

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

b. At least two technically qualified members of the Facility Staff independently verify the release rate calculations and discharge valve lineup;

Otherwise, suspend release of radioactive 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 40 - With the number of channnels 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.

of one TRAIN

less than the minimum required

of both trains

ACTION 41 - 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 samples are continuously collected with auxiliary sampling equipment as required in Table 4.11-2.

TABLE 4.3-9

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					
a. Noble Gas Activity Monitor - Providing Alarm and Automatic Termination of Release - RM-A10	P	P	R(3)	Q(1)	*
2. WASTE GAS HOLDUP SYSTEM EXPLOSIVE GAS MONITORING SYSTEM					
a. Oxygen Monitor and Hydrogen Monitor (upstream of recombiner)	D	N.A.	Q(4)	N.A.	**
b. Oxygen Monitor and Hydrogen Monitor (downstream of recombiner)	D	N.A.	Q(4)	N.A.	**
~~c. Oxygen Monitor (alternate) (1-upstream of recombiner)~~	~~D~~	~~N.A.~~	~~Q(5)~~	~~N.A.~~	~~**~~
~~3. CONDENSER EVACUATION SYSTEM~~					
~~a. Noble Gas Activity Monitor RM-A9~~	~~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. Flow Rate Monitoring Device~~	~~D~~	~~N.A.~~	~~R~~	~~Q~~	~~*~~
~~e. Sampler Flow Rate Monitoring Device~~	~~D~~	~~N.A.~~	~~R~~	~~Q~~	~~*~~

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TABLE 4.3-9 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
3 ~~4~~. REACTOR BUILDING PURGE SYSTEM					
a. Noble Gas Activity Monitor - Providing Alarm and Automatic Termination of Release - RM-A4	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. Flow Rate ~~Monitor~~ Measuring device	D	N.A.	R	Q	*
e. Sampler Flow Rate Monitor	D	N.A.	R	Q	*
4 ~~5~~. MAIN PLANT VENT EXHAUST SYSTEM					
a. Noble Gas Activity Monitor - RM-A3	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. Flow Rate ~~Monitor~~ Measuring Device	D	N.A.	R	R	*
e. Sampler Flow Rate Monitor	D	N.A.	R	R	*

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TABLE 4.3-9 (Continued)

TABLE NOTATION

* At all times during releases via this pathway
** 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 any of the following conditions exists:

1. Instrument indicates measured levels above the alarm/trip setpoint.
~~2. Circuit failure.~~
2 ~~3.~~ Instrument indicates instrument power ~~a downscale~~ failure:
3 ~~4.~~ Instrument controls not set in operate mode. (i.e. power on)

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

1. Instrument indicates measured levels above the alarm setpoint.
~~2. Circuit failure.~~
2 ~~3.~~ Instrument indicates instrument power ~~a downscale~~ failure.
3 ~~4.~~ Instrument controls not set in operate mode. (i.e. power on)

(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.

(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.

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3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE

LEAKAGE DETECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

3.4.6.1 The following Reactor Coolant System leakage detection systems shall be OPERABLE:

a. The reactor building atmosphere particulate radioactivity monitoring system, (RM-A2),

b. The reactor building sump level, and

c. Either the reactor building cooling unit condensate flow rate or a reactor building atmosphere gaseous radioactivity monitoring system (RM-A2).

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only two of the above required leakage detection systems OPERABLE, operation may continue for up to 30 days provided grab samples of the containment atmosphere are obtained and analyzed at least once per 24 hours when the required gaseous or particulate radioactive monitoring system is inoperable; otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.4.6.1 The leakage detection systems shall be demonstrated OPERABLE by:

a. Reactor building atmosphere particulate monitoring system-performance of CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST at the frequencies specified in Table 4.3-3,

b. Reactor building sump level-performance of CHANNEL CALIBRATION at least once per 18 months,

c. Reactor building atmosphere gaseous radioactivity monitoring system-performance of CHANNEL CHECK, CHANNEL CALIBRATION, AND CHANNEL FUNCTIONAL TEST at the frequencies specified is Table 4.3-3

d. Reactor building cooling unit condensate flow detector-performance of CHANNEL CALIBRATION at least once per 18 months.

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3/4.4.10 STRUCTURAL INTEGRITY

LIMITING CONDITION FOR OPERATION

3.4.10 The structural integrity of ASME Code Class 1, 2 and 3 components shall be maintained in accordance with Specification 4.4.10

APPLICABILITY: All MODES

ACTION:

a. With the structural integrity of any ASME Code Class 1 component(s) not conforming to the above requirements, restore the structural integrity of the affected component(s) to within its limit or isolate the affected component(s) prior to increasing the Reactor Coolant System temperature more than 50°F above the minimum temperature required by NDT considerations.

b. With the structural integrity of any ASME Code Class 2 component(s) not conforming to the above requirements, restore the structural integrity of the affected component(s) to within its limit or isolate the affected component(s) prior to increasing the Reactor Coolant System temperature above 200°F.

c. With the structural integrity of any ASME Code Class 3 component(s) not conforming to the above requirements, restore the structural integrity of the affected component(s) to within its limit or isolate the affected component(s) from service.

d. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.10 In addition to the requirements of Specification 4.0.5, each reactor coolant pump flywheel shall be inspected per the recommendations of Regulatory Position C.4.b of Regulatory Guide 1.14, Revision 1, August 1975.

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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}
1. Waste Monitor Tanks	P One Batch/M	M	Dissolved and Entrained Gases (Gamma emitters)	1×10^{-5}
~~2. Condensate Demineralizer Backwash Receiving Tank~~	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. Continuous Releases[e]	~~Continuous~~[c] D Grab Sample	W Composite[c]	Principal Gamma Emitters[f]	5×10^{-7}
			I-131	1×10^{-6}
1. Steam Generator Blowdown	M Grab Sample	M	Dissolved and Entrained Gases (Gamma Emitters)	1×10^{-5}
2. Turbine Building Sump[g]	~~Continuous~~[c] D Grab Sample	M Composite[c]	H-3	1x10-5
			Gross Alpha	1×10^{-7}
			P-32	1×10^{-6}
	~~Continuous~~[c] D Grab Sample	Q Composite[c]	Sr-89, Sr-90	5×10^{-8}
			Fe-55	1×10^{-6}

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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):

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

Where:

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

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

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

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

2.22×10^6 is the number of transformations per minute per microcurie,

Y is the fractional radiochemical yield (when applicable),

λ is the radioactive decay constant for the particular radionuclide, and

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. Typical values of E, V, Y, and Δt shall be used in the calculation.

Note: Concentrations less than LLD shall be entered as zero in all accountability calculations.

DRAFT

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~~ composited in proportion to the rate of flow of the effluent stream. Prior to analyses, all samples taken for the composite shall be throughly 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 nondiscrete 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.

g. This release path has an automatic sampler which will operate whenever the sump is discharged.

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LIQUID HOLDUP 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 less than or equal to 10 curies, excluding tritium and dissolved or entrained noble gases.

a. Condensate Storage Tank
b. Outside Temporary Storage Tank, excluding liners being used to solidify radioactive wastes

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 or radioactive material to the tank and within 48 hours reduce the tank contents to within the limit.

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

SURVEILLANCE REQUIREMENTS

4.11.1.4 The quantity of radioactive material contained in each of the 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.

SETTLING POND

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LIMITING CONDITION FOR OPERATION

3.11.1.5 The quantity of radioactive material contained in each settling pond shall be limited by the following expression:

$$\frac{264}{V} \cdot \sum_j \frac{A_j}{C_j} < 1.0$$

excluding tritium and dissolved or entrained noble gases, where,

A_j = Pond inventory limit for single radionuclide "j", in curie.

C_j = 10 CFR 20, Appendix B, Table II, column 2, concentration for single radionuclide "j", microcuries/ml.

V = design volume of liquid and slurry in the pond, in gallons.

264 = Conversion unit, microcuries/curie per milliliter/gallon.

APPLICABILITY: At all times.

ACTION:

a. With the quantity of radioactive material in the settling pond exceeding the above limit, immediately suspend all additions of radioactive material to the pond and within 48 hours reduce the pond contents to within the limit.

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

SURVEILLANCE REQUIREMENTS

4.11.1.5 The quantity of radioactive material contained in each batch of slurry (used powdex resin) to be transferred to the settling ponds shall be determined to be within the above limit by analyzing a representative sample of the slurry, and batches to be transferred to the settling ponds shall be limited by the expression:

$$\sum \frac{Q_j}{C_j} < ~~6.0 \times 10^5 \frac{pCi/gm}{\mu Ci/ml}~~ 0.006$$

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SURVEILLANCE REQUIREMENTS (Continued)

where

Q_j = concentration of radioactive materials in wet, ~~drained~~ slurry (used powdex resin) for radionuclide "j" excluding tritium, dissolved or entrained noble gas and radionuclides with ~~greater~~ than 8 day half-life. The analysis shall include at least Ce-144, Cs-134, Cs-137, Sr-89, Sr-90, Co-58 and Co-60 in ~~picocuries/gram.~~ microcuries/milliliter (See Note)

C_j = 10 CFR 20, Appendix B, Table II column 2 concentration for single radionuclide "j", in microcuries/milliliter.

Note: IF survey for principle γ-emitters results in no detectable activity greater than the LLD values in Table 4.11-1, further analysis for non-γ-emitting isotopes is not required and activity is not considered present in the slurry.

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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. Reactor Building Purge	P Each Purge[b,c] Grab Sample	P Each Purge[b,c]	Principal Gamma Emitters[g]	1×10^{-4}
			H-3	1×10^{-6}
C. Main Plant Vent	~~M~~ Grab Sample	~~M~~	Principal Gamma Emitters[g]	1×10^{-4}
			H-3	1×10^{-6}
D. Iodine and Particulate	Continuous[f] Sampler	W[d] Charcoal Sample	I-131	1×10^{-12}
			I-133	1×10^{-10}
1. Reactor Building Purge	Continuous[f] Sampler	W[d] Particulate Sample	Principal Gamma Emitters[g] (I-131, Others)	1×10^{-11}
2. Main Plant Vent	Continuous[f] Sampler	M Composite Particulate Sample	Gross Alpha	1×10^{-11}
3. Main Condenser Air Removal System	Continuous[f] Sampler	Q Composite Particulate Sample	Sr-89, Sr-90	1×10^{-11}
E. Noble Gases, All Release Types as listed in A, B, and C above	Continuous[f]	Noble Gas Monitor	Noble Gases Gross Beta & Gamma	1×10^{-6}

1. Waste Gas Storage Tank
2. Condenser Vaccuum Exhaust
3. Auxiliary Building Exhaust
4. Fuel Handling Building Exhaust

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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):

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

Where:

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

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

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

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

2.22×10^6 is the number of transformations per minute per microcurie,

Y is the fractional radiochemical yield (when applicable),

λ is the radioactive decay constant for the particular radionuclide, and

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. Typical values of E, V, Y, and Δt shall be used in the calculation.

Note: Concentrations less than LLD shall be entered as zero in all accountability calculations.

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TABLE 4.11-2 (Continued)

TABLE NOTATION

b. Analyses shall also be performed following shutdown, startup, or a THERMAL POWER change exceeding 15 percent of the RATED THERMAL POWER within a one hour period, when purge is in progress.

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

d. Samples shall be changed at least once per 7 days and analyses shall be completed within 48 hours after changing (or after removal from sampler). Sampling shall also be performed at least once per 24 hours for at least 7 days following each shutdown, startup or THERMAL POWER change exceeding 15 percent of RATED THERMAL POWER in one hour* and analyses shall be completed within 48 hours of changing. 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, whenever spent fuel is in the spent fuel pool.

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 measureable and identifiable, together with the above nuclides, shall also be identified and reported.

* does not apply to main plant vent; applies to Reactor Building purge, if purge is in progress.

RADIOACTIVE EFFLUENTS

GASEOUS RADWASTE TREATMENT

DRAFT

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 mrad for gamma radiation and 0.4 mrad for beta radiation. 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 mrem to any organ.

0.83 — 0.83 — 1.7

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 or subsystems and the reason for inoperability,

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

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

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

SURVEILLANCE REQUIREMENTS

4.11.2.4.1 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 TREATMENT SYSTEM shall be demonstrated OPERABLE by operating the GASEOUS RADWASTE TREATMENT SYSTEM equipment and VENTILATION EXHAUST TREATMENT SYSTEM equipment for at least 30 minutes, at least once per 92 days unless the appropriate system has been utilized to process radioactive gaseous effluents during the previous 92 days.

RADIOACTIVE EFFLUENTS

GAS STORAGE TANKS

DRAFT

LIMITING CONDITION FOR OPERATION

3.11.2.6 The quantity of radioactivity contained in each gas storage tank shall be limited to less than or equal to 60,000 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

4.11.2.6.1 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~~ 7 days when radioactive materials are being added to the tank.

4.11.2.6.2 In the event of Confirmed Fuel Failure (>1%), the quantity of radioactive material contained in each waste gas storage tank shall be determined to be within the above Limit at Least once per 24 hours when radioactive materials have been added to the tank in the previous 24 hours.

See New Table 3.12-1

TABLE 3.12-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
VIRGIL C. SUMMER NUCLEAR STATION

Exposure Pathway and/or Sample		Criteria for Selection of Sample Locations**	Sampling and Collection Frequency	Sample Locations Location(1)	Mi/Dir	Type and Frequency of Analysis
1. AIRBORNE						
1. Particulate	A	3 Indicator samples to be taken at locations (in different sectors beyond but as practicable where the highest offsite sectoral ground level concentrations are anticipated. (2)	Continuous sampler operation with weekly collection.	2 5 10	1.1 SW 1.3 SE 2.4 NNE	Gross beta following filter change; Monthly composite (by location) for gamma isotopic.
	B	1 Indicator sample to be taken in the sector beyond as close to the exclusion boundary as practicable corresponding to the residence having the highest anticipated offsite ground level concentration or dose. (2)		6	1.1 ESE	

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TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample		Criteria for Selection of Sample Locations**	Sampling and Collection Frequency	Sample Locations Location(1)	Mi/Dir	Type and Frequency of Analysis
AIRBORNE (continued)	C	1 Indicator sample to be taken at the location of one of the dairies most likely to be affected.(2) (4)		14(4)	5.2 W	
	D	2 Control samples to be taken at locations at least 10 air miles from the site and not in the most prevalent wind direction.(2)		17	24.7 SE	
				16	28.0 W	
II. Radioiodine	A	3 Indicator samples to be taken at two locations as given in I.A above.	Continuous sampler operation with weekly cannister collection.	2 5 10	1.1 SW 1.3 SE 2.4 NNE	Gamma isotopic screening of all with conjunctive screening of the two controls. If screening is positive, each sample will be subjected to isotopic analysis for iodine.
	B	1 Indicator sample to be taken at the location as given in I.B above.		6	1.1 ESE	

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TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample	Criteria for Selection of Sample Locations**	Sampling and Collection Frequency	Locations Location(1)	Mi/Dir	Type and Frequency of Analysis
	C 1 Indicator sample to be taken at the location as given in I.C above.		14	5.2 W	
	D 2 Control samples to be taken at locations similar in nature to A-C above.		16 17	28.0 W 24.7 SE	
III. Direct	A 5 Indicator samples to be taken at the locations as given in I.A through D above.	Monthly exchange.(4) Two or more dosimeters at each location.	#'s 2, 5, 6, 10, and 14.		Gamma dose monthly(5)
	B 3 Additional indicator samples to be taken in sectors different from III.A above, beyond but as close to the exclusion boundary as practicable.		1 4 8	1.3 S 1.2 NW 1.3 ENE	
	C Control samples to be taken at the locations as given in I.D above.		16 17	28.0 W 24.7 SE	

TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample		Criteria for Selection of Sample Locations**	Sampling and Collection Frequency	Locations Station(1)	Mi/Dir	Type and Frequency of Analysis
	D	1 Additional control sample to be taken at a locations as set forth in I.D above.		18	16.5 S	
WATERBORNE IV. Surface Water	A	1 Indicator sample be taken at a location which allows for mixing and dilution in the ultimate receiving river.	Time composite samples with collection every month (corresponds to USGS continuous sampling site.(5)	21(3) (6)	2.7 SSE	Gamma isotopic with quarterly composite (by location) to be analyzed for tritium.(7)
	B	1 Control sample to be taken at a location on the receiving river, sufficiently far upstream such that no effects of pumped storage operation are anticipated.		22(3)	12-15 NNW	
	C	1 Indicator sample location immediately upstream of the nearest downstream municipal water supply		17	24.7 S	

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TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample		Criteria for Selection of Sample Locations**	Sampling and Collection Frequency	Locations Location(1)	Mi/Dir	Type and Frequency of Analysis
		D 1 Indicator sample to be taken in the upper reservoir of the pumped storage facility.	Grab sampling monthly(5)	23(3)	<1 E	As in V above.
		E 1 Indicator sample to be taken in the upper reservoir's non-fluctuating recreational area.		18(3)	16.5 S	
		F 1 Control sample to be taken at a location on a separated unaffected watershed reservoir.		18(3)	16.5 S	
V.	Ground Water	A 2 Indicator samples to be taken within the exclusion boundary and in the direction of protentially affected ground water supplies.	Quarterly grab sampling(7)	26 27	Onsite Onsite	Gamma isotopic and tritium analyses quarterly.(7)
		B 1 Control sample from an unaffected location.		16	28.0W	

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TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample		Criteria for Selection of Sample Locations**	Sampling and Collection Frequency	Locations Location(1)	Mi/Dir	Type and Frequency of Analysis
WATERBORNE, (continued)	B	1 Control sample from an unaffected location.		16	28.0 W	
VI. Drinking Water	A	1 Indicator sample nearby public ground water supply source.	Monthly grab sampling(5)	28	1.3 ESE	Monthly(5) gamma isotopic and gross Beta analyses and quarterly(7) tritium analyses
	B	1 Indicator (finished water) sample from the nearest downstream water supply.	Monthly grab sampling(5)	17	24.7 S	
INGESTION VII. Milk(5)	A	1 Indicator sample to be taken at the location of one of the dairies most likely to be affected.(2) (5)	Semi-monthly when animals are on pasture,(8) monthly other times.(5)	14(4)	5.. W	Gamma isotopic and analysis semi-monthly(8) when animals are on pasture; monthly(5) at other times
	B	1 Control sample to be taken at the location of a diary 10-20 miles distank and not in the most prevalent wind direction.(2)		16	28.0 W	

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TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample		Criteria for Selection of Sample Locations**	Sampling and Collection Frequency	Locations Location(1)	Mi/Dir	Type and Frequency of Analysis
	C	1 Indicator grass (for age) sample to be taken at one of the locations beyond but as close to the exclusion boundary as practicable where the highest offsite sectoral ground level concentrations are anticipated.(2)	Monthly when available(5)	6	1.1 ESE	Gamma Isotopic
VIII. Food Product	A	1 Indicator sample to be taken at a nearby garden likely to be effected.	Annually at the approximate median harvest time for the area. Samples, if available, will include: green leafy, fruit, and grain.	6	1.1 ESE	Gamma isotopic on edible portion. Radioiodine on green leafy vegetables.
	B	1 Control sample for the same foods taken at a location at least 10 miles distant and not in the most prevalent wind direction.		18(3)	16.5 S	

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TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample	Criteria for Selection of Sample Locations**	Sampling and Collection Frequency	Locations Location(1)	Locations Mi/Dir	Type and Frequency of Analysis
IX. Fish	A 1 Indicator sample to be taken at a location in the upper reservoir.	Semi-annual[9] collection of the following specie types if available; bass, bream, crappie; catfish, carp; forage fish (shad).	23[3]	0.3-5	Gamma isotopic on edible portions semi-annually
INGESTION, (continued)	B 1 Indicator sample to be taken at a location on the receiving river, sufficiently far upstream such that no effects of pumped storage operation are anticipated.		21[3]	1-3	
AQUATIC					
X. Sediment	A 1 Indicator sample to be taken at a location in the upper reservoir.	Semi-annual grab sample[9]	23[3]	0.3-4	Gamma isotopic[3]
AQUATIC (continued)	B 1 Indicator sample to be taken in the upper reservoir's non-fluctuating reactional area.		24[3]	4-5 N	

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TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample	Criteria for Selection of Sample Locations**	Sampling and Collection Frequency	Locations Location(1)	Locations Mi/Dir	Type and Frequency of Analysis
AQUATIC (continued)	C 1 Indicator sample to be taken on the shoreline of the lower reservoir.		24(3)	4-5 N	
	D 1 Control sample to be taken in receiving river, sufficiently far upstream such that no effects of pumped storage operation are anticipated.		22(3)	12-15	

(1) Location numbers refer to figures in the ODCM.

(2) Sample site locations are based on the meteorological analysis for the period of recrod as presented in Chapter 5 and 6 of the FSAR.

(3) Though generalized areas are noted for simplicity of sample site enumeration, airborne, water, and sediment sampling is done at the same location whereas biological sampling sites are generalized areas in order to reasonably assure availability of samples.

(4) Milking animal and garden survey results will be analyzed annually. Should the survey indicate new dairying activity of a significant nature (5 or more cows milking) in a quadrant(s) other than W or NW and closer than 5-7 miles, the owners shall be contacted with regard to a contract for supplying sufficient samples. If contractural arrangements can be made, the site(s) will be added for additional milk sampling.

(5) Not to exceed 35 days.

(6) Time composite samples are samples which are collected with equipment capable of collecting an aliquot at time intervals which are short (e.g., hourly) relative to the compositing period.

TABLE 3.12-1 (Continued)

(7) At least once per 100 days.

(8) At least once per 18 days.

(9) At least once per 200 days.

NOTE: Deviations from this sampling schedule may occasionally be necessary if sample media are unobtainable due to hazardous conditions, seasonal unavailability, insufficient sample size, malfunctions of automatic sampling or analysis equipment and other legitimate reasons. If specimens are unobtainable due to sampling equipment malfunction, every effort shall be made to complete corrective action prior to the end of the next sampling period. Seviations from sampling-analyses schedule will be described in the annual report.

TABLE 3.12-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
VIRGIL C. SUMMER NUCLEAR STATION

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number and Location	Sampling and Collection Frequency	Sample Locations Location(1)	Sample Locations Mi/Dir	Type and Frequency of Analysis
AIRBORNE					
I. Particulates	A 3 Indicator samples to be taken at locations (in different sectors) beyond but as close to the exclusion boundary as practicable where the highest offsite sectoral ground level concentrations are anticipated.(2)	Continuous sampler operation with weekly collection.	2 5 10	1.1 SW 1.3 SE 2.4 NNE	Gross beta following filter change; Monthly composite (by location) for gamma isotopic.
	B 1 Indicator sample to be taken in the sector beyond but as close to the exclusion boundary as practicable corresponding to the residence having the highest anticipated offsite ground level concentration or dose.(2)		6	1.1 ESE	
	C 1 Indicator sample to be taken at the location of one of the dairies most likely to be affected.(2) (4)		14(4)	5.2 W	

3/4 12-3

TABLE 3.12.1 (Continued)

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number and Location	Sampling and Collection Frequency	Sample Locations Location(1)	Sample Locations Mi/Dir	Type and Frequency of Analysis
AIRBORNE, (continued)	D 2 Control samples to be taken at locations at least 10 air miles from the site and not in the most prevalent wind directions.(2)		17 16	24.7 SE 28.0 W	
II. Radioiodine	A 3 Indicator samples to be taken at two locations as given in I.A above.	Continuous sampler operation with weekly cannister collection.	2 5 10	1.1 SW 1.3 SE 2.4 NNE	Gamma isotopic screening of all five indicators with conjunctive screening of the two controls. If screening is positive, each sample will be subjected to isotopic analysis for iodine.
	B 1 Indicator sample to be taken at the location as given in I.B above.		6	1.1 ESE	
	C 1 Indicator sample to be taken at the location as given in I.C above.		14	5.2 W	
	D 2 Control samples to be taken at locations similar in nature to A-C above.		17 16	24.7 SE 28.0 W	

3/4 12-4

TABLE 3.12.1 (Continued)

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number and Location	Sampling and Collection Frequency	Sample Locations Location	Mi/Dir	Type and Frequency of Analysis
AIRBORNE, (Continued)					
III. Direct	A. 5 Indicator samples to be taken at the locations as given in I.A through D above.	Monthly exchange.(5) Two or more dosimeters at each location.	#'s 2, 5, 6, 10, and 14		Gamma dose monthly(5)
	B. 3 Additional indicator samples to be taken in sectors different from III.A above, beyond but as close to the exclusion boundary as practicable.		1	1.3 S	
			4	1.2 NW	
			8	1.3 ENE	
	C. Control samples to be taken at the locations as given at I.D above.		16	28.0 W	
			17	24.7 SE	
	D. 1 Additional control sample to be taken at a location as set forth in I.D above		18	16.5 S	
	E. Additional Sites		3	.8 WSW	
			7	1.7 E	
			9	2.6 NE	
			11	3.6 NNE	
			12	4.3 N	
			13	2.9 NNW	
			15	2.3 SSW	
			19	17.9 ESE	
			20	22.0 NW	
	F. Accident Evaluation Quarterly Exchange Program (7)	Quarterly exchange.(5) Two or more dosimeters at each location.	41	3.7 S	Gamma dose quarterly.
			42	3.6 SSW	
			43	4.7 SW	
			44	2.3 WSW	
			45	5.4 WSW	
			46	3.7 WNW	
			47	1.0 NW	

3/4 12-5

TABLE 3.12.1 (Continued)

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number and Location	Sampling and Collection Frequency	Sample Locations Location	Mi/Dir	Type and Frequency of Analysis
AIRBORNE, (Continued)					
III. Direct	F. (Continued)		48	2.4 NW	
			49	4.6 NNW	
			50	5.6 N	
			51	5.6 N	
			52	4.3 NNE	
			53	3.6 NE	
			54	2.2 ENE	
			55	3.2 E	
			56	2.0 ESE	
			57	2.7 SE	
			58	2.4 SSE	
			59	2.1 SSE	
			60	5.7 WSW	
WATERBORNE					
IV. Surface Water	A. 1 Indicator sample to be taken at a location which allows for mixing and dilution in the ultimate receiving river.	Time composite samples with collection every month (corresponds to USG continuous sampling site).(5)	21(3)(6)	2.7 SSE	Gamma isotopic with quarterly composite (by location) to be analyzed for tritium.(7)

3/4 12-6

TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number and Location	Sampling and Collection Frequency	Sample Locations Location(1)	Mi/Dir	Type and Frequency of Analysis
WATERBORNE, (continued)	B 1 Control sample to be taken at a location on the receiving river, sufficiently far upstream such that no effects of pumped storage operation are anticipated.		22(3)	12-15 NNW	
	C 1 Indicator sample from location immediately upstream of the nearest downstream municipal water supply		17	24.7 S	
	D 1 Indicator sample to be taken in the upper reservoir of the pumped storage facility.	Grab sampling monthly (5)	23(3)	<1 E	As in V above.
	E 1 Indicator sample to be taken in the upper reservoir's non-fluctuating recreational area.		24(3)	4.7 N	
	F 1 Control sample to be taken at a location on a separated unaffected watershed reservoir.		18(3)	16.5 S	
V. Ground Water	A 2 Indicator samples to be taken within the exclusion boundary and in the direction of potentially affected ground water supplies.	Quarterly grab sampling(7)	26 27	Onsite Onsite	Gamma isotopic and tritium analyses quarterly.(7)

3/4 12-7

TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample		Criteria for Selection of Sample Number and Location	Sampling and Collection Frequency	Sample Locations Location(1)	Sample Locations Mi/Dir	Type and Frequency of Analysis
WATERBORNE, (continued)	B	1 Control sample from an unaffected location.		16	28.0 W	
VI. Drinking Water	A	1 Indicator sample from nearby public ground water supply source.	Monthly grab sampling(5)	28	1.3 ESE	Monthly(5) gamma isotopic and gross Beta analyses and quarterly(7) tritium analyses
	B	1 Indicator (finished water) sample from the nearest downstream water supply.	Monthly grab sampling(5)	17	24.7 S	
INGESTION						
VII. Milk(5)	A	1 Indicator sample to be taken at the location of one of the dairies most likely to be affected.(2) (5)	Semi-monthly when animals are on pasture,(8) monthly other times.(5)	14(4)	5.2 W	Gamma isotopic and I-131 analysis semi-monthly(8) when animals are on pasture; monthly(5) at other times
	B	1 Control sample to be taken at the location of a dairy 10-20 miles distant and not in the most prevalent wind direction.(2)		16	28.0 W	
	C	1 Indicator grass (forage) sample to be taken at one of the locations beyond but as close to the exclusion boundary as practicable where the highest offsite sectoral ground level concentrations are anticipated.(2)	Monthly when available(5)	6	1.1 ESE	Gamma Isotopic

3/4 3.12-8

TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number and Location	Sampling and Collection Frequency	Sample Locations: Location[1]	Sample Locations: Mi/Dir	Type and Frequency of Analysis
INGESTION, (continued)	D 1 Indicator grass (forage) sample to be taken at the location of VIII.A above when animals are on pasture.		14[4]	5.2 W	
	E 1 Control grass (forage) sample to be taken at the location of VIII.B above.		16	28.0 W	
VIII. Food Products	A 1 Indicator sample to be taken at a nearby garden likely to be affected.	Annually at the approximate median harvest time for the area. Samples, if available, will include: green leafy, fruit, and grain.	6	1.1 ESE	Gamma isotopic on edible portion. Radioiodine on green leafy vegetables.
	B 1 Control sample for the same foods taken at a location at least 10 miles distant and not in the most prevalent wind direction.		18[3]	16.5 S	
IX. Fish	A 1 Indicator sample to be taken at a location in the upper reservoir.	Semi-annual[9] collection of the following specie types if available: bass, bream, crappie; catfish, carp; forage fish (shad).	23[3]	0.3-5	Gamma isotopic on edible portions semi-annually

TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample		Criteria for Selection of Sample Number and Location	Sampling and Collection Frequency	Sample Locations Location[1]	Sample Locations M (Dir	Type and Frequency of Analysis
INGESTION, (continued)	B	1 Indicator sample to be taken at a location in the lower reservoir		21[3]	1-3	
	C	1 Indicator sample to be taken at a location in the upper reservoir's non-fluctuating recreational area.		24[3]	4-5 N	
	D	1 Control sample to be taken at a location on the receiving river, sufficiently far up-stream such that no effects of pumped storage operation are anticipated.		22[3]	12-15 NNW	
AQUATIC						
X. Sediment	A	1 Indicator sample to be taken at a location in the upper reservoir.	Semi-annual grab sample[9]	23[3]	0.3-4	Gamma isotopic[3]

3/4 12-10

TABLE 3.12-1 (Continued)

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number and Location	Sampling and Collection Frequency	Sample Locations Location(1)	Sample Locations Mi/Dir	Type and Frequency of Analysis
AQUATIC (continued)	B 1 Indicator sample to be taken in the upper reservoir's non-fluctuating recreational area.		24(3)	4-5 N	
	C 1 Indicator sample to be taken on the shoreline of the lower reservoir.		21(3)	1-3	
	D 1 Control sample to be taken in receiving river, sufficiently far upstream such that no effects of pumped storage operation are anticipated.		22(3)	12-15	

3/4 12-11

(1) Location numbers refer to Figures 3.0-1 and 3.0-2 in the ODCM.

(2) Sample site locations are based on the meteorological analysis for the period of record as presented in Chapters 5 and 6.

(3) Though generalized areas are noted for simplicity of sample site enumeration, airborne, water and sediment sampling is done at the same location whereas biological sampling sites are generalized areas in order to reasonably assure availability of samples.

TABLE 3.12-1 (Continued)

(4) Milking animal and garden survey results will be analyzed annually. Should the survey indicate new dairying activity of a significant nature (5 or more cows milking) in a quadrant(s) other than W or NW and closer than 5-7 miles, the owners shall be contacted with regard to a contract for supplying sufficient samples. If contractural arrangements can be made, the site(s) will be added for additional milk sampling.

(5) Not to exceed 35 days.

(6) Time composite samples are samples which are collected with equipment capable of collecting an aliquot at time intervals which are short (e.g. hourly) relative to the compositing period.

(7) At least once per 100 days.

(8) At least once per 18 days.

(9) At least once per 200 days.

NOTE: Deviations from this sampling schedule may occasionally be necessary if sample media are unobtainable due to hazardous conditions, seasonal unavailability, insufficient sample size, malfunctions of automatic sampling or analysis equipment and other legitimate reasons. If specimens are unobtainable due to sampling equipment malfunction, every effort shall be made to complete corrective action prior to the end of the next sampling period. Deviations from sampling-analyses schedule will be described in the annual report.

3/4 12-12

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

3/4.11.1.4 LIQUID HOLDUP TANKS

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

3/4 11.1.5 SETTLING PONDS

The inventory limits of the settling ponds (SP) are based on limiting the consequences of an uncontrolled release of the pond inventory. The expression in Specification 3.11.1.5 assumes the pond inventory is uniformly mixed, that the pond is located in an uncontrolled area as defined in 10 CFR 20, and that the concentration limit in Note 1 to Appendix B of 10 CFR 20 applies.

The batch limits of slurry to the chemical treatment ponds assure that radioactive material in the slurry transferred to the SP are "as low as is reasonably achievable" in accordance with 10 CFR 50.36a. The expression in Specification 4.11.1.5 assures no batch of slurry will be transferred to the SP unless the sum of the ratios of the activity of the radionuclides to their respective concentration limitation is less than the ratio of the 10 CFR 50, Appendix I, Section II.A, total body level to the 10 CFR 20, 105(a), whole body dose limitation, or that:

$$\sum_j \frac{\rho_j}{C_j} < \frac{3 \text{ mrem/yr}}{500 \text{ mrem/yr}} = 0.006$$

where

ρ_j = radioactive slurry concentration for radionuclide "j" entering the unrestricted area SP, in microcuries/milliliter

3/4 11.1.5 SETTLING PONDS (Continued)

C_j = 10 CFR 20, Appendix B, Table II, Column 2, concentration for single radionuclide "j", in microcuries/milliliter.

Delete

For the design of filter/demineralizers using powder resin, the slurry wash volume and the weight of resin used per batch is fixed by the cell surface area and the slurry volume to resin weight ratio is constant at 100 milliliters/gram of wet, drained resin with a moisture content of approximately 55 to 60% (bulk density of about 58 pounds per cubic feet). Therefore,

$$\sum_j \frac{C_j}{C_j} = \sum_j \frac{Q_j}{C_j\ (10^2\ ml/gm)(10^6\ pCi/\mu Ci)} < 0.006, \text{ and}$$

$$\sum_j \frac{Q_j}{C_j} < 6 \times 10^5\ \frac{pCi/gm}{\mu Ci/ml}$$

Where the terms are defined in Specification 4.11.1.5.

The batch limits provide assurance that activity input to the SP will be minimized, and a means of identifying radioactive material in the inventory limitation of Specification 3.11.1.5.

3/4.11.2 GASEOUS EFFLUENTS

3/4.11.2.1 DOSE RATE

This specification is provided to ensure that the dose at any time at 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 1. 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)). 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 less than or equal to 500 mrem/year to the total body or to less than or equal to 3000 mrem/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background to an infant via the cow-milk-infant pathway to less than or equal to 1500 mrem/year for the nearest cow to the plant.

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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 as shown in Figure 5.1-3.

SITE BOUNDARY FOR LIQUID EFFLUENTS

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

5.2 REACTOR BUILDING

CONFIGURATION

5.2.1 The reactor containment building is a steel lined, Pre-stressed, Post tensioned reinforced concrete building of cylindrical shape, with a dome roof and having the following design features:

a. Nominal inside diameter = 126 feet.

b. Nominal inside height = 187 feet.

c. Minimum thickness of concrete walls = 4 feet.

d. Minimum thickness of concrete roof = 3 feet.

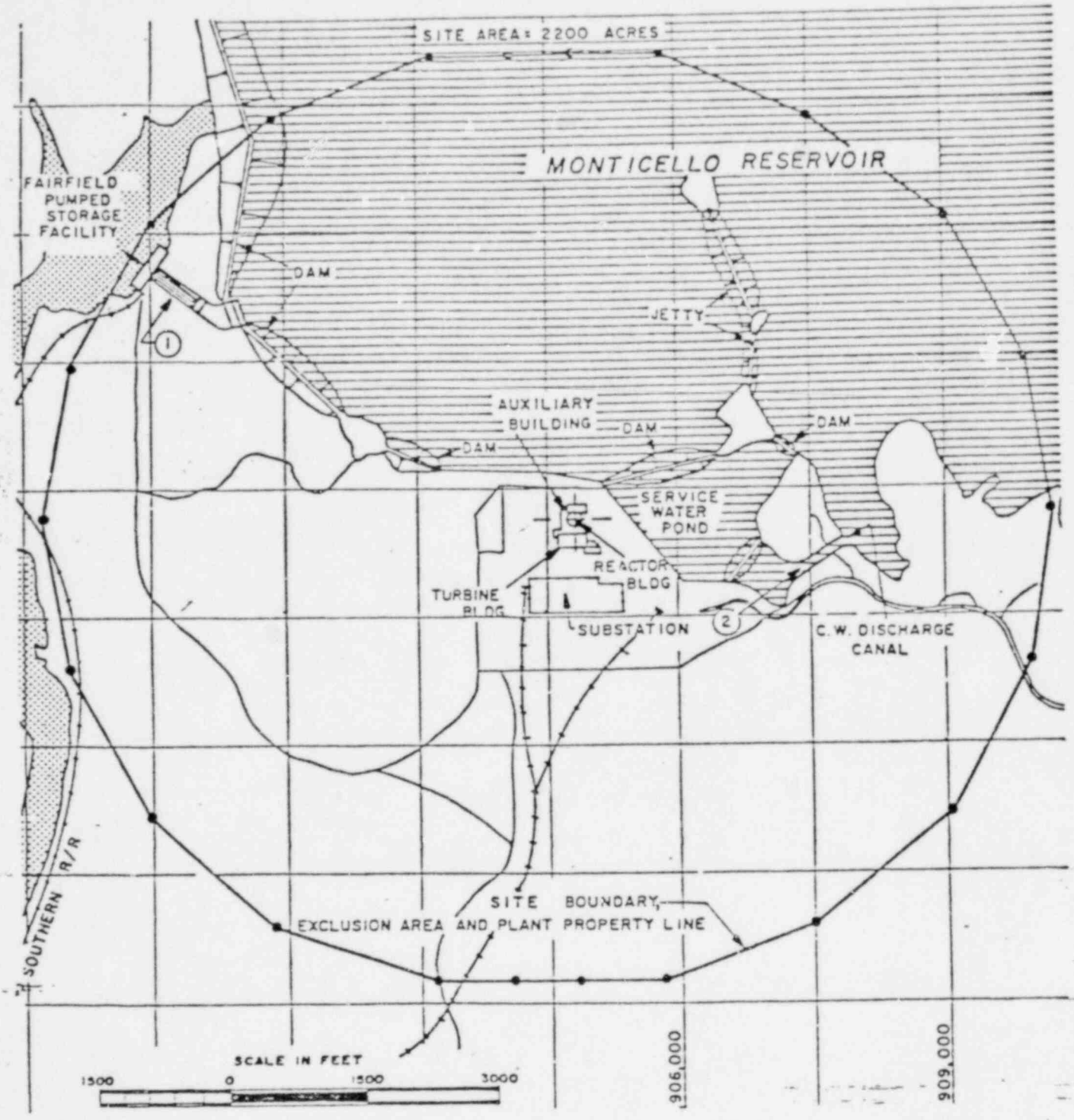
e. Minimum thickness of concrete floor pad = 4 feet.

f. Nominal thickness of steel liner = 0.25 inches.

g. Net free volume = 1.842×10^6 cubic feet.

DESIGN PRESSURE AND TEMPERATURE

5.2.2 The reactor containment building is designed and shall be maintained for a maximum internal pressure of 57 psig and a temperature of 283°F.



LIQUID RELEASES:

(1) FAIRFIELD PUMPED STORAGE FACILITY PENSTOCKS
(A) LIQUID WASTE PROCESSING SYSTEM
(B) PROCESSED STEAM GENERATOR BLOWDOWN

(2) CIRCULATING ~~CIRULATING~~ WATER DISCHARGE CANAL
(A) UNPROCESSED STEAM GENERATOR BLOWDOWN
(B) TURBINE BUILDING FLOOR DRAINS

SOUTH CAROLINA ELECTRIC & GAS CO.
VIRGIL C. SUMMER NUCLEAR STATION

Location of Liquid Release Points

Figure 5.1-4

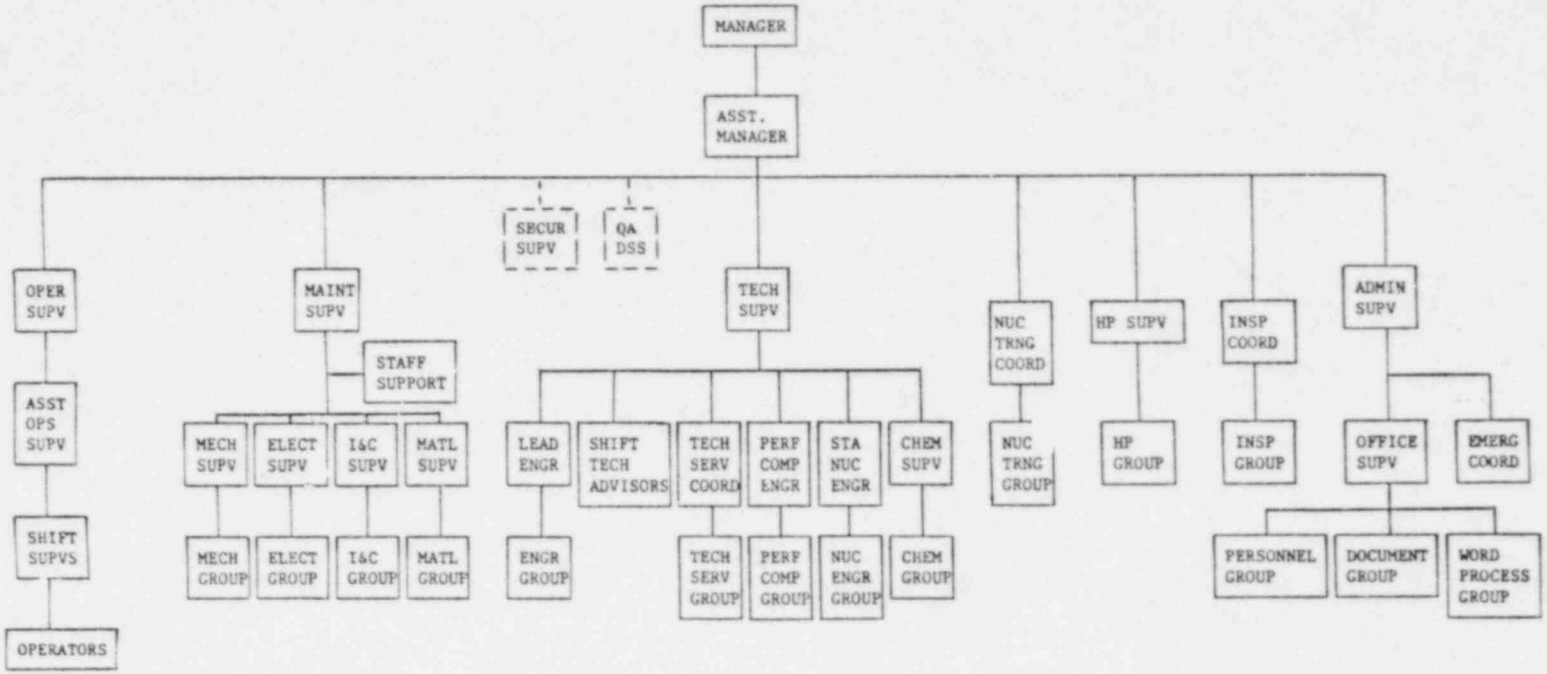


FIGURE 6.2-2

V.C. SUMMER NUCLEAR STATION
FUNCTIONAL ORGANIZATION