TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

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PDR ADOCK 05000285
P PDR

TABLE OF CONTENTS (ALPHABETICAL ORDER)

Continued

TABLE 2-4
(Continued)

d A and B circuits are both actuated by ~~any~~ either one of the ~~five~~ two VIAS initiating channels~~; RM-050, RM-051, RM-060, RM-061, or RM-062; however, only RM-050 and RM-051 are required for containment ventilation isolation~~.

e If minimum operable channel conditions are reached, one inoperable channel must be placed in the tripped condition within eight hours from the time of discovery of loss of operability. The remaining inoperable channel may be bypassed for 48 hours from the time of discovery of loss of operability and, if an inoperable channel is not returned to operable status within this time frame, a unit shutdown must be initiated (see Specification 2.15(2)).

f If one channel becomes inoperable, that channel must be placed in the tripped or bypassed condition within eight hours from the time of discovery of loss of operability. If bypassed and that channel is not returned to operable status within 48 hours from the time of discovery of loss of operability, that channel must be placed in the tripped condition within the following eight hours. (See Specification 2.15(1) and exception associated with maintenance.)

5.9.3 Special Reports

Special reports shall be submitted to the Regional Administrator of the appropriate NRC Regional Office within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specification where appropriate:

a. In-service inspection report, reference 3.3.
b. Tendon surveillance, reference 3.5.
c. Containment structural tests, reference 3.5.
d. Special maintenance reports.
e. Containment leak rate tests, reference 3.5.
f. ~~Radioactive effluent releases, reference 2.9.~~ DELETED
g. Materials radiation surveillance specimens reports, reference 3.3.
h. Fire protection equipment outage, reference 2.19.
i. Post-accident monitoring instrumentation, reference 2.21
j. Electrical systems, reference 2.7(2).

5.9.4 Unique Reporting Requirements

a. Radioactive Effluent Release Report

A report covering the operation of the Fort Calhoun Station during the previous six months shall be submitted within 60 days after January 1 and July 1 of each year per the requirements of 10 CFR 50.36a.

Attachment 8

The radioactive effluent release report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the plant as outlined in Regulatory Guide 1.21, Revision 1.

The radioactive effluent release report shall include a summary of the meteorological conditions concurrent with the release of gaseous effluents during each quarter as outlined in Regulatory Guide 1.21, Revision 1.

The radioactive effluent release report shall include an assessment of radiation doses from the radioactive liquid and gaseous effluents released from the unit during each calendar quarter as outlined in Regulatory Guide 1.21, Revision 1. In addition, the unrestricted area boundary maximum noble gas gamma air and beta air doses shall be evaluated. The meteorological conditions concurrent with the

Amendment No. 9,~~24~~,~~38~~,~~46~~,~~86~~,
~~110~~,~~113~~,~~133~~, ~~147~~

Attachment 8

a. Semiannual Radioactive Effluent Release Report

The Semiannual Radioactive Effluent Release Report covering the operation of the unit during the previous 6 months of operation shall be submitted within 60 days after January 1 and July 1 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be 1) consistent with the objectives outlines in the ODCM and PCP, and 2) in conformance with 10 CFR 50.36a. and Section IV.B.1 of Appendix I to 10 CFR 50.

b. Annual Radiological Environmental Operating Report

The Annual Radiological Environmental Operating Report covering the operation of the unit during the previous calendar year shall be submitted before May 1 of each year. The report shall include summaries, interpretations, and analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in (1) the ODCM and (2) Section IV.B.2, IV.B.3, and IV.C of Appendix I to 10 CFR 50.

TECHNICAL SPECIFICATIONS
TABLE OF CONTENTS

Amendment No. ~~32~~,~~38~~,~~52~~,~~54~~,~~57~~,~~67~~,
~~80~~,~~84~~,~~86~~,~~116~~,

TABLE OF CONTENTS (ALPHABETICAL ORDER)
Continued

5.9.3 Special Reports

Special reports shall be submitted to the Regional Administrator of the appropriate NRC Regional Office within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specification where appropriate:

a. In-service inspection report, reference 3.3.
b. Tendon surveillance, reference 3.5.
c. Containment structural tests, reference 3.5.
d. Special maintenance reports.
e. Containment leak rate tests, reference 3.5.
f. DELETED
g. Materials radiation surveillance specimens reports, reference 3.3.
h. Fire protection equipment outage, reference 2.19.
i. Post-accident monitoring instrumentation, reference 2.21
j. Electrical systems, reference 2.7(2).

5.9.4 Unique Reporting Requirements

a. Semiannual Radioactive Effluent Release Report

The Semiannual Radioactive Effluent Release Report covering the operation of the unit during the previous 6 months of operation shall be submitted within 60 days after January 1 and July 1 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be 1) consistent with the objectives outlines in the ODCM and PCP, and 2) in conformance with 10 CFR 50.36a, and Section IV.B.1 of Appendix I to 10 CFR 50.

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The Annual Radiological Environmental Operating Report covering the operation of the unit during the previous calendar year shall be submitted before May 1 of each year. The report shall include summaries, interpretations, and analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in (1) the ODCM and (2) Section IV.B.2, IV.B.3, and IV.C of Appendix I to 10 CFR 50.

ATTACHMENT B

DISCUSSION, JUSTIFICATION, AND NO SIGNIFICANT HAZARDS CONSIDERATIONS

DISCUSSION AND JUSTIFICATION

The Omaha Public Power District (OPPD) proposes to revise the Fort Calhoun Station Unit No. 1 Technical Specifications to implement Generic Letter 89-01 concerning the Radiological Effluent Technical Specifications (RETS), and to revise the requirements for the Containment Radiation High Signal following the guidance of NUREG-0133.

Proposed changes to RETS

As specified in Generic Letter 89-01, it is proposed to relocate RETS from the Technical Specifications to the Offsite Dose Calculation Manual (ODCM). The following is a description of the proposed changes:

1. The definitions for the ODCM and Process Control Program (PCP) were revised to agree with the definitions in Generic Letter 89-01. Definitions for purge-purging and venting were moved to the ODCM.

2. Technical Specifications 2.9 under Limiting Condition for Operations Section, and 3.11 and 3.12 under Surveillance Requirements Section were relocated from the Technical Specifications and incorporated into the ODCM.

3. Tables 3-2, 3-3, and 3-4 were revised to ensure that LCO requirements, which are currently controlled by Specification 3.12, were retained. The surveillance function and frequency for Containment Radiation High Signal, Area and Post Accident Radiation Monitors, and Primary-to-Secondary leak rate detection radiation monitors in Table 3.2 are updated for consistency. Sampling requirements for steam generator blowdown are being relocated from Table 3-11, which is being deleted, to Table 3-4. Operating modes are being added to the sampling of steam generator blowdown consistent with the actions required by Specification 2.20.

4. Tables 3-9, 3-11, and 3-12 were relocated from the Technical Specifications and incorporated into the ODCM.

5. Specifications 2.9 and 3.12 are proposed to retain requirements in the Technical Specifications that are related to explosive gases. This was a specific requirement of the Generic Letter. The grab sample provisions are in agreement with the present Specification 2.9.1(2)d. A 48 hour Limiting Condition for Operation has been added for the time allowed for hydrogen and oxygen concentrations to be out of specification. This is consistent with the Standard RETS.

6. Reporting and records requirements were revised in Section 5.9.4 and Sections 5.16, 5.17, and 5.18 under Administrative Controls were added to the Technical Specifications to define administrative details of the ODCM and PCP. Records retention for RETS will be covered under existing Technical Specification 5.10.2.

Administrative changes

a. The Table of Contents is being revised to reflect proposed changes.

b. Page 2-8 is being revised to correct a reference that was changed as a result of the Generic Letter changes.

c. Page 2-38 is being revised to delete a reference to the specific procedure which implements the independent verification of fuel burnup which is required to move fuel directly to Region 2 of the spent fuel pool. The requirements remain, only the name of the procedure is being deleted. Additionally, wording which reflects the CE Standard Technical Specifications is being added to clarify movement of irradiated fuel.

d. Reference 2 on Page 2-63 is being revised to reflect a Section of the Updated Safety Analysis Report (USAR) which better describes the Containment Radiation High Signal.

e. Table 2-4, Item 3B on page 2-69 is being revised to reflect the requirements of CE Standard Technical Specifications. As described in USAR Section 7.3.2.6 and Specification 2.8(2), the Containment Radiation High Signal (CRHS) isolates the containment pressure relief, air sample, and purge system valves. As currently written, it could be implied that all valves which receive a VIAS are required to be closed in order to place the CRHS channels in bypass. This change clarifies the requirements that only the containment vent and purge valves are required to be closed. A description of these valves is being added to the basis of Specification 2.15 on page 2-66a. A change is also proposed for page 2-66a to revised the term FSAR to the present nomenclature for this document which is the USAR (Updated Safety Analysis Report).

f. Page 3-0b is being revised to delete an example of a surveillance test table that will be relocated to the ODCM. Additionally, a typographical error "Code of Federal Requirements," is being corrected to read "Code of Federal Regulations."

g. Page 3-63b is being revised to include a statement on the bottom of the page indicating that the next page will be page 3-69.

h. Page 5-19 is being revised to add records retention requirements for the ODCM and PCP.

i. Page 5-19a is being revised to change the references to Sections of 10 CFR Part 20 which reflect changes to 10 CFR Part 20 and to revised the definition of a Very High Radiation Area so that this definition does not conflict with the definition which has been added to 10 CFR Part 20.

ATTACHMENT C

COMPARISON OF PARAGRAPH NUMBERS FROM TECH. SPECS TO ODCM

Tech. Spec.	ODCM
2.9.1 Objective	1.0
2.9.1.A.(1)	1.1.2
2.9.1.A.(2)	1.1.3
2.9.1.B.(1)	1.2.2
2.9.1.B.(2)	1.2.3
2.9.1.B.(3)	1.2.4
2.9.1.(1)a.(i)	1.1.1
2.9.1.(1)a.(ii)	1.1
2.9.1.(1)b.	4.1.1
2.9.1.(1)b.(i)	4.1.1.A
2.9.1.(1)b.(ii)	4.1.1.B
2.9.1.(1)b.(iii)	4.1.1.C
2.9.1.(1)c.	4.2.1
2.9.1.(1)c.(i)	4.2.1.A
2.9.1.(1)c.(ii)	4.2.1.B
2.9.1.(1)c.(iii)	4.2.1.C
2.9.1.(1)d.	2.1.1
2.9.1.(1)d.(i)	2.1.1.1
2.9.1.(1)d.(ii)	2.1.1.2
2.9.1.(1)d.(iii)	2.1.1.3
2.9.1.(1)d.(iii)1.	2.1.1.3.A
2.9.1.(1)d.(iii)2.	2.1.1.3.B
2.9.1.(1)d.(iii)(Notes)	2.1.1.4
	2.1.1.5
2.9.1.(1)e.1)	2.1.2.2
2.9.1.(1)e.2)	2.1.2.3
2.9.1.(1)e.	2.1.2.3.A
	2.1.2.3.B
	2.1.2.4
2.9.1.(2)a.(i)	1.2.1
2.9.1.(2)a.(ii)	1.2
2.9.1.(2)b.	4.2.1
2.9.1.(2)b.(i)	4.2.1.A
2.9.1.(2)b.(ii)	4.2.1.B
2.9.1.(2)b.(iii)	4.2.1.C
2.9.1.(2)c.	4.2.2
2.9.1.(2)c.(i)	4.2.2.A
2.9.1.(2)c.(ii)	4.2.2.B
2.9.1.(2)c.(iii)	4.2.2.C
2.9.1.(2)d.	Retained in Tech. Specs.
2.9.1.(2)e.	2.2.1.4
2.9.1.(2)e.1)	2.2.1.4.A
2.9.1.(2)e.2)	2.2.1.4.B
2.9.1.(2)f.	2.2.2.1
2.9.1.(2)g.	2.2.1.1
2.9.1.(2)g.(i)	2.2.1.1.A
2.9.1.(2)g.(ii)	2.2.1.1.C
2.9.1.(2)g.(iii)	2.2.1.1.B
2.9.1.(2)g.(iv)	2.2.1.1.D
	2.2.1.1.E

COMPARISON OF PARAGRAPH NUMBERS FROM TECH. SPECS TO ODCM
Page Two

Tech. Spec.	ODCM
2.9.1.(2)g.(v)	2.2.1.2.A/B
2.9.1.(2)h.(i)	2.2.3.1
2.9.1.(2)h.(i)	2.2.3.1.A
	2.2.3.1.B
2.9.1.(2)h.(ii)	2.2.3.1.C
3.11 Objective	5.0
3.11(1)	5.1.1
3.11(2)	5.1.3
3.11(3)	5.1.4
3.11(3)a.	5.1.4.A
3.11(3)b.	5.1.4.B
3.11(3)b.(Note)	5.1.4.B
3.11(4)	5.1.5
3.12.1 Objective	3.0
3.12.1(1)a.	3.1.1
3.12.1(1)b.	3.1.2
	3.1.2.1
	3.1.2.2
3.12.1(1)c.(i)(ii)(iii)	Table 3, Part A
3.12.1(1)d.(i)(ii)(iii)(iv)	Table 3, Part A
3.12.1(1)e.	Table 3, Note #4
3.12.1(1)f.	3.1.3
3.12.1(2)a.	3.2.1
3.12.1(2)b.(i)(ii)(iii)(iv)	Table 3, Part D
3.12.1(2)b.(v)	Table 3, Part B
3.12.1(2)c.(i)(ii)	Table 3, Part B
Table 3-11, Note (4)	3.3
Table 3-12, Note (4)	3.3
5.9.4.a.	4.3
5.9.4.b.1.	4.4
5.9.4.b.1.a.	4.4.1
5.9.4.b.1.b.	4.4.2
5.9.4.b.1.c.	4.4.3
5.9.4.b.1.d.	4.4.4
5.9.4.b.1.e.	4.4.5
5.9.4.b.1.e.(1)	4.4.5.1
5.9.4.b.1.(2)	4.4.5.1.A
5.9.4.b.1.(3)	4.4.5.1.B
5.9.4.b.1.(4)	4.4.5.1.C
5.9.4.b.1.(5)	4.4.5.1.D
5.9.4.b.2.	4.5

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PART III

RADIOLOGICAL EFFLUENT RADIATION MONITOR CALCULATIONS

1.0 EFFLUENT MONITOR SETPOINTS

1.1 Liquid Effluents

There are two liquid discharge pathways to the Missouri River. These pathways originate with the radioactive liquid waste processing system (monitor or hotel tanks) and the steam generator blowdown system. Both of these pathways empty into the circulating water system which discharges to the Missouri River (see Figure 1). Figure 2 depicts the liquid discharge pathways and associated radiation monitors. Figure 3 depicts the methods of liquid effluent treatment. A detailed discussion of the liquid effluent treatment system is presented in Section 2.1.

The flowrate for dilution water varies with the number of circulating water pumps in service and with the operation of the warm water recirculation. Some warm water from the condenser outlet is diverted from the circulating water discharge to upstream of the intake structure to help prevent ice from forming on the circulating water pump intakes during winter months. The varying dilution flowrate is accounted for in the dilution calculations for monitor tank and stream generation releases.

Alarm setpoints shall be established for the liquid effluent monitoring instrumentation to ensure that the concentration of radioactive material released in liquid effluents to unrestricted areas shall be less than the concentrations specified in 10 CFR 20, Appendix B, Table 2, Column 2.

Cs-137 is the most abundant radionuclide in liquid effluent streams and is used to calibrate the liquid effluent monitors.

2.1.2 Steam Generator (Continued)

2.1.2.3

to 0.01 µCi/gram dos equivalent I-131 and at least

C. Once per 12 hours when the specific activity of the secondary coolant is greater than 0.01 µCi/gram dose equivalent I-131.

2.1.2.4 The radioactivity for each blowdown line shall be continuously recorded. If the process radiation monitor chart recorder is not operational, Steam Generator releases may continue provided that the radioactivity level is recorded manually at least once per four hours during actual release.

2.2 Gaseous Effluent Releases

2.2.1 Gaseous Auxiliary Building Exhaust Stack

2.2.1.1 During release of gaseous radioactive effluents from containment pressure relief line to the Auxiliary Building Exhaust Stack, the following conditions shall be met:

A. The Auxiliary Building Exhaust Stack noble gas monitor, iodine sampler and particulate sampler shall be operational.

B. The Auxiliary Building Exhaust Stack noble gas radiation monitor shall be set in accordance with Part III to alarm and automatically terminate the release prior to exceeding 10 CFR 20 limits at site boundary (see Figure 1).

C. At least one Auxiliary Building exhaust fan shall be in operation.

PART III

1.2 Liquid Effluent Radiation Monitors

1.2.1 Steam Generator Blowdown Monitors (RM-054A and B)

These process radiation detectors monitor the flow through the steam generator blowdown lines and automatically close the blowdown isolation valves if the monitor high alarm setpoint is reached. The high alarm setpoint calculations are based on controlling the discharge at 10 CFR 20 limits of 1.0E-07 μCi/ml for unrestricted areas.

The following calculations for maximum concentration and alarm setpoints are valid when steam generator blowdown is the only liquid release pathway. For simultaneous radioactive liquid releases of steam generator blowdown and monitor tank discharge, refer to Section 1.5.1.

The maximum allowable concentration in the blowdown line is calculated as follows:

$$A_o = \frac{(1.0E\text{-}07\ \mu Ci/ml)\ (X_o)}{Y_o}$$

Where:

1.0E-07 μCi/ml = 10 CFR 20 Limit for unidentified radionuclides at site discharge (I-129, Ra-226 and Ra-228 are not present).

X_o = Total dilution flow in the discharge tunnel (gpm). (Normal flow is based on 1 circulating water pump at 120,000 gpm. Other flowrates may be used, as required.)

Y_o = Blowdown flow rate (gpm). (Normal blowdown flow rate is based on 2 transfer pumps with a design flow of 135 gpm each, 270 gpm total. Other flow rates may be used, as required.)

A_o = Maximum allowable blowdown concentration (μCi/ml).

1.2.1 Steam Generator Blowdown Monitors (RM-054A and B) (Continued)

The high alarm setpoint (CPM) =

$$.85 \; [\; (S_f) \; (A_o) + B \;]$$

Where:

.85 = Correction factor for instrument meter error.

S_f = Detector sensitivity factor (CPM/μCi/ml). (Sensitivity based on Cs-137).

A_o = Maximum allowable blowdown line activity (μCi/ml).

B = Background (CPM).

Setpoints may be recalculated based on adjusted dilution flow and adjusted blowdown flow.

An alert setpoint will be chosen at a value below the alarm setpoint so that significant increases in activity will be identified prior to automatic actuation of the blowdown isolation valves.

1.2.2 Overboard Discharge Header Monitor (RM-055 or RM-055A)

This process radiation monitor provides control of the waste monitor tank effluent by monitoring the overboard header prior to its discharge into the circulating water discharge tunnel. The concentration of activity at discharge is controlled below the 10 CFR 20 limit of 1.0E-07 μCi/ml for unrestricted areas for unidentified isotopes by the high alarm setpoint which closes the overboard flow control valve.

The following calculations for maximum concentration and alarm setpoints are valid when Monitor Tank discharge is the only liquid release pathway. For simultaneous radioactive liquid releases of monitor tank discharge and steam generator blowdown, refer to Section 1.5.1.

1.2.2 Overboard Discharge Header Monitor (RM-055 or RM-055A) (Continued)

The maximum allowable concentration in the overboard discharge header is:

$$A_o = \frac{(1.0E\text{-}07\ \mu Ci/ml)\ \ (X_o)}{Y_o}$$

Where:

1.0E-07 µCi/ml = 10 CFR 20 Limit for unidentified radionuclides at site discharge (I-129, Ra-226 and Ra-228 are not present).

X_o = Total dilution flow in the discharge tunnel (gpm). (Normal flow is based on 1 circulating water pump at 120,000 gpm. Other flowrates may be used, as required.)

Y_o = Maximum monitor tank discharge flow rate (gpm). (Normal monitor tank maximum flow is 50 gpm. Other flow rates may be used, as required.)

A_o = Maximum allowable activity in discharge header (µCi/ml).

1.2.2 Overboard Discharge Header Monitor (RM-055 or RM-055A) (Continued)

The high alarm setpoint (CPM) =

$$.85 \; [\; (S_f) \; (A_o) + B \;]$$

Where:

.85 = Correction factor for instrument meter error.

S_F = Detector sensitivity factor (CPM/μCi/ml). (Sensitivity based on Cs-137).

A_o = Maximum allowable concentration in discharge header (μCi/ml).

B = Background (CPM).

An alert setpoint will be chosen at a value below the alarm setpoint so that significant increases in activity will be identified, prior to automatic actuation of the overboard flow control valve.

1.3 Gaseous Effluents

The gaseous effluent monitoring instrumentation for controlling and monitoring normal radioactive material releases in accordance with 10 CFR 20, appendix B, Table 2, Column 1 limits for unrestricted areas (see Figure 1), are summarized as follows:

A. Auxiliary Building - The Auxiliary Building Exhaust Stack receives discharges from the waste gas decay tanks, containment purge, containment vent systems and the auxiliary building ventilation system. Effluents are monitored by RM-062, a noble gas activity monitor. Additionally, noble gas activity monitor, RM-051, provides redundant back-up monitoring capabilities to the RM-062 monitor. Iodine monitoring and sampling capabilities are provided by RM-060. Particulate monitoring is provided by RM-061. Redundant particulate monitoring is provided by RM-050. Ventilation Isolation Actuation Signal (VIAS) is actuated by exceeding a monitor's alarm setpoint. Actuation of VIAS will isolate releases from containment and waste gas decay tanks. The Auxiliary Building Exhaust fans will remain in operation.

B. Laboratory and Radioactive Waste Processing Building (LRWPB) - Noble gas, iodine, and particulate monitoring is provided by Radiation Monitors RM-043, RM-042, and RM-041, respectively. These radiation monitors do not serve a control function.

C. Condenser Off-Gas Monitors - Noble gas activity is monitored by RM-057. The condenser off-gas is discharged directly to the environment. Exceeding the high alarm setpoint on RM-057 will activate isolation of main steam to the Auxiliary Steam System.

A gaseous radioactive waste flow diagram with the applicable, associated radiation monitoring instrumentation and controls is presented as Figure 4. The gaseous waste disposal system is presented in Figure 5. A detailed discussion of the gaseous effluent treatment system is presented in Section 2.2.

1.4 Gaseous Effluent Radiation Monitors

1.4.1 Auxiliary Building Exhaust Stack Particulate Monitors (RM-061/RM-050)

Either of these monitors may be used to measure airborne particulate activity in the exhaust stack. The detector is located adjacent to a section of moveable filter paper on a capstan drive. The monitor alarm setpoint is based on 10 CFR 20 limits of 1.0 E-10 μCi/cc at the site boundary.

The following calculations for maximum release rate and alarm setpoint are valid when the Auxiliary Building Exhaust Stack is the only gaseous release pathway. For simultaneous gaseous releases from Auxiliary Building Exhaust Stack, condenser off-gas, and the LRWPB Exhaust Stack, refer to Section 1.5.2. The maximum allowable release rate for stack particulates is calculated as follows:

$$\frac{(1.0E\text{-}10\ \mu Ci/cc)}{(5.0E\text{-}06\ sec/m^3)} \times (1.0E\text{+}06\, cc/m^3) = 2.0E\text{+}01\ \mu Ci/sec$$

Where:

1.0E-10 μCi/cc = 10 CFR 20 Limit at site boundary for unidentified isotopes.

5.0E-06 sec/m³ = Annual average dispersion factor at the site boundary.

1.0E+06 cc/m³ = Constant of unit conversion.

The high alarm setpoint (CPM):

$$Setpoint = .85\ \left[\frac{(2.0E\text{+}01)\ (S_F)\ (F_s)\ (T)}{(F_V)} + B \right]$$

1.4.1 Auxiliary Building Exhaust Stack Particulate Monitors (RM-061/RM-050) (Continued)

Where:

.85 = Correction for instrument meter error.

S_F = Detector sensitivity factor (CPM/μCi). (Sensitivity based on Cs-137).

F_s = Monitor sample flow rate (SCFM).

T = Effective monitor response time (sec).

F_v = Auxiliary Building Exhaust stack flow rate (SCFM). (Default maximum flow rate is 122500 cfm for 3 Auxiliary Building exhaust fans and 2 containment purge fans in operation. Other flow rates may be used, as required.)

B = Background (CPM).

An alert setpoint will be chosen at a value below the alarm setpoint so that significant increases in activity will be identified, prior to exceeding the alarm setpoint.

1.4.2 Auxiliary Building Exhaust Stack Gaseous Activity Monitors (RM-062/RM-051)

Either of these monitors may be used to measure gaseous activity in the exhaust stack. The gas is monitored after passing through a particulate filter. The monitor controls gaseous activity releases so that the 10 CFR 20 limit for the unrestricted areas of 3.0E-07 µCi/cc, based upon Xe-133, is not exceeded. The Ventilation Isolation Actuation Signal is initiated when the high alarm setpoint is reached.

The following calculations for maximum release rate and alarm setpoint are valid when Auxiliary Building Exhaust Stack is the only gaseous release pathway. For simultaneous gaseous releases from Auxiliary Building Exhaust Stack, condenser off-gas and the LRWPB Exhaust Stack, refer to Section 1.5.2.

The maximum allowable release rate for stack gaseous activity is calculated as follows:

$$\frac{(3.0E\text{-}07\ \mu Ci/cc)}{(5.0E\text{-}06\ \sec/m^3)} \times (1.0E{+}06\ cc/m^3) = 6.0E{+}04\ \ \mu Ci/\sec$$

Where:

3.0E-07 µCi/cc	=	10 CFR 20 Limit at site boundary (based upon Xe-133).
5.0E-06 sec/m³	=	Annual average dispersion factor at the site boundary.
1.0E+06 cc/m³	=	Constant of unit conversion.

The high alarm setpoint (CPM):

$$Setpoint = .85\ \left[\ \frac{(6.00E{+}04)\ (S_g)\ (60)}{(F_v)\ (28317)} + B\ \right]$$

1.4.2 Auxiliary Building Exhaust Stack Gaseous Activity Monitors (RM-062/RM-051) (Continued)

Where:

.85 =	Correction for instrument meter error.
S_F =	Detector sensitivity factor (CPM/ µCi/cc). (Sensitivity based on Xe-133)
60 =	Conversion (seconds to minutes).
28317 =	Conversion factor (ft^3 to cc).
F_v =	Auxiliary Building Exhaust stack flow rate (SCFM). (Default maximum flow rate is 122500 cfm for 3 Auxiliary Building exhaust fans and 2 containment purge fans in operation. Other flow rates may be used, as required.)
B =	Background (CPM).

An alarm setpoint will be chosen at a value below the alarm setpoint so that significant increases in activity will be identified, prior to actuation of VIAS.

1.4.3 Auxiliary Building Exhaust Stack Iodine Monitor (RM-060)

RM-060 monitors the gaseous waste discharged from the exhaust stack for Iodine-131 activity by continuously counting a charcoal cartridge and pre-filter through which a sample of exhaust stack air is passing at a known rate. The monitor alarm setpoint is based on the 10 CFR 20 limit for Iodine-131 at the site boundary.

The following calculations for maximum release rate and alarm setpoint are valid when Auxiliary Building Exhaust Stack is the only gaseous release pathway. For simultaneous gaseous releases from Auxiliary Building Exhaust Stack, condenser off-gas and the LRWPB Exhaust Stack, refer to Section 1.5.2.

The maximum allowable release rate for stack iodine is calculated as follows:

$$\frac{(1.0E\text{-}10\ \mu Ci/cc)}{(5.0E\text{-}06\ sec/m^3)} \times (1.0E\text{+}06\ cc/m^3) = 2.0E\text{+}01\ \mu Ci/sec$$

Where:

1.0E-10 μCi/cc = 10 CFR 20 Limit at site boundary (based upon I-131).

5.0E-06 sec/m³ = Annual average dispersion factor at site boundary.

1.0E+06 cc/m³ = Constant of unit conversion.

The high alarm setpoint (CPM):

$$Setpoint = .85\ \left[\frac{(2.0E\text{+}01)\ (S_p)\ (F_s)\ (T)\ (E)}{(F_v)} + B \right]$$

1.4.3 Auxiliary Building Exhaust Stack Iodine Monitor (RM-060) (Continued)

Where:

.85 = Correction for instrument meter error.

S_F = Detector sensitivity factor (CPM/μCi). (Sensitivity based on I-131)

F_s = Monitor sample flow rate (SCFM).

T = Effective monitor response time (sec).

F_v = Auxiliary Building Exhaust stack flow rate (SCFM). (Default maximum flow rate is 122500 cfm for 3 Auxiliary Building exhaust fans and 2 containment purge fans in operation. Other flow rates may be used, as required.)

E = Charcoal filter collection efficiency.

B = Background (CPM).

An alert setpoint will be chosen at a value below the alarm setpoint so that significant increases in activity will be identified.

1.4.4 Condenser Air Ejector Monitor (RM-057)

This monitor is located in the turbine building and monitors the condenser off-gas. The purpose of this monitor is to monitor the condenser off-gas discharges so that the 10 CFR 20 limit for unrestricted areas of 3.0E-07 μCi/cc, based upon Xe-133, is not exceeded.

The following calculations for maximum release rate and alarm setpoint are valid when condenser off-gas is the only gaseous release pathway. For simultaneous gaseous releases from condenser off-gas, Auxiliary Building Exhaust Stack, and the LRWPB Exhaust Stack, refer to Section 1.5.2.

The maximum allowable release rate for condenser air ejector monitor is as follows:

$$\frac{(3.0E\text{-}07\ \mu Ci/cc)}{(5.0E\text{-}06\ \sec/m^3)} \times (1.0E{+}06\ cc/m^3) = 6.0E{+}04\ \mu Ci/\sec$$

Where:

3.0E-07 μCi/cc = 10 CFR 20 Limit at site boundary (based upon Xe-133).

5.0E-06 sec/m^3 = Annual average dispersion factor at the site boundary.

1.0E+06 cc/m^3 = Constant of unit conversion.

The high alarm setpoint (CPM):

$$Setpoint = .85\ \left[\frac{(6.00E{+}04)\ (S_F)\ (60)}{(F_v)\ (28317)} + B\right]$$

1.4.4 Condenser Air Ejector Monitor (RM-057) (Continued)

Where:

.85	=	Correction for instrument meter error.
S_F	=	Detector sensitivity factor (CPM/μCi/cc). (Sensitivity based on Xe-133)
60	=	Conversion (seconds to minutes).
28317	=	Conversion factor (ft^3 to cc).
F_v	=	Vent stack flow rate (SCFM). Default maximum flow rate is 4755 scfm (3 vacuum pumps in hogging mode. Other flow rates may be used, as required.)
B	=	Background (CPM).

An alert setpoint will be chosen at a value below the alarm setpoint so that significant increases in activity will be identified, allowing time for corrective actions prior to exceeding the alarm setpoint and tripping of the auxiliary steam supply valve, RCV-978.

1.4.5 Laboratory and Radioactive Waste Processing Building (LRWPB) Exhaust Stack Particulate Monitor (RM-041)

This monitor is used to measure airborne particulate activity in the LRWPB exhaust stack. The detector is located adjacent to a removable filter paper. The monitor alarm setpoint is based on 10 CFR 20 limits of 1.0E-10 μCi/cc at the site boundary.

The following calculations for maximum release rate and alarm setpoint are valid when LRWPB Exhaust Stack is the only gaseous release pathway. For simultaneous gaseous releases from Auxiliary Building Exhaust Stack, condenser off-gas, and the LRWPB Exhaust Stack, refer to Section 1.5.2.

The maximum allowable release rate for stack particulates is calculated as follows:

$$\frac{(1.0E\text{-}10\ \mu Ci/cc)}{(5.0E\text{-}06\ sec/m^3)} \times (1.0E{+}06\ cc/m^3) = 2.0E{+}01\ \mu Ci/sec$$

Where:

1.0E-10 μCi/cc = 10 CFR 20 Limits at site boundary for unidentified isotopes.

5.0E-06 sec/m^3 = Annual average dispersion factor at the site boundary.

1.0E+06 cc/m^3 = Constant of unit conversion.

The high alarm setpoint (CPM):

$$Setpoint = .85\ \left[\ \frac{(2.0E{+}01)\ (S_F)\ (F)\ (T)}{(F_v)} + B\ \right]$$

1.4.5 Laboratory and Radioactive Waste Processing Building (LRWPB) Exhaust Stack Particulate Monitor (RM-041) (Continued)

Where:

.85 = Correction for instrument meter error.

S_F = Detector sensitivity factor (CPM/μCi). (Sensitivity based on Cs-137).

F_s = Monitor sample flow rate (SCFM).

T = Effective monitor response time (sec).

F_v = LRWPB Exhaust stack flow rate (SCFM). (Default maximum flow rate is 28700 cfm. Other flow rates may be used, if required.)

B = Background (CPM).

An alert setpoint will be chosen at a value below the alarm setpoint so that significant increases in activity will be identified, prior to exceeding the alarm setpoint.

This monitor alarms in the Control Room. There are no automatic control functions associated with the actuation of the alarm.

1.4.6 Laboratory and Radioactive Waste Processing Building Exhaust Stack Iodine Monitor (RM-042)

RM-042 monitors the gaseous waste discharged from the LRWPB for Iodine-131 activity by continuously counting a charcoal filter cartridge through which a sample of LRWPB exhaust air is passing at a known rate. The monitor alarm setpoint is based on the 10 CFR 20 limit for Iodine-131 at the site boundary.

The following calculations for maximum release rate and alarm setpoint are valid when LRWPB Exhaust Stack is the only gaseous release pathway. For simultaneous gaseous releases from Auxiliary Building Exhaust Stack, condenser off-gas, and the LRWPB Exhaust Stack, refer to Section 1.5.2.

The maximum allowable release rate for stack iodine is calculated as follows:

$$\frac{(1.0E\text{-}10\ \mu Ci/cc)}{(5.0E\text{-}06\ sec/m^3)} \times (1.0E{+}06\,cc/m^3) = 2.0E{+}01\ \mu Ci/sec$$

Where:

1.0E-10 μCi/cc = 10 CFR 20 Limit at site boundary (based upon I-131).

5.0E-06 sec/m^3 = Annual average dispersion factor at the site boundary.

1.0E+06 cc/m^3 = Constant of unit conversion.

The high alarm setpoint (CPM):

$$Setpoint = .85\ \left[\frac{(2.0E{+}01)\ (S_F)\ (F)\ (T)\ (E)}{(F_V)} + B \right]$$

1.4.6 Laboratory and Radioactive Waste Processing Building Exhaust Stack Iodine Monitor (RM-042) (Continued)

Where:

.85 = Correction for instrument meter error.

S_F = Detector sensitivity factor (CPM/μCi). (Sensitivity based on I-131)

F_s = Monitor sample flow rate (SCFM).

T = Effective monitor response time (sec).

F_v = LRWPB Exhaust stack flow rate (SCFM). (Default flow rate is 28700 cfm. Other flow rates may be used, if required.)

E = Charcoal filter collection efficiency.

B = Background (CPM).

An alert setpoint will be chosen at a value below the alarm setpoint so that significant increases in activity will be identified.

This monitor alarms in the Control Room. There are no automatic control functions associated with the actuation of the alarm.

1.4.7 Laboratory and Radioactive Waste Processing Building Exhaust Stack Noble Gas Monitor (RM-043)

RM-043 is located in the Radwaste Building and samples the LRWPB Exhaust Stack. The monitor alarm setpoint is based on the 10 CFR 20 limit for Xe-133 at the site boundary.

The following calculations for maximum release rate and alarm setpoint are valid when the LRWPB Exhaust Stack is the only gaseous release pathway. For simultaneous gaseous releases from condenser off-gas, Auxiliary Building Exhaust Stack, and the LRWPB Exhaust Stack, refer to Section 1.5.2.

The maximum allowable release rate for RM-043 is as follows:

$$\frac{(3.0E\text{-}07\ \mu Ci/cc)}{(5.0E\text{-}06\ sec/m^3)} \times (1.0E{+}06\, cc/m^3) = 6.0E{+}04\ \mu Ci/sec$$

Where:

3.0E-07 μCi/cc = 10 CFR 20 Limit at site boundary (based upon Xe-133).

5.0E-06 sec/m³ = Annual average dispersion factor at the site boundary.

1.0E+06 cc/m³ = Constant of unit conversion.

The high alarm setpoint (CPM):

$$Setpoint = .85\ \left[\frac{(6.00E{+}04)\ (S_F)\ (60)}{(F_v)\ (28317)} + B \right]$$

1.4.7 Laboratory and Radioactive Waste Processing Building Exhaust Stack Noble Gas Monitor (RM-043) (Continued)

Where:

.85	=	Correction for instrument meter error.
S_F	=	Detector sensitivity factor (CPM/μCi/cc). (Sensitivity based on XE-133)
60	=	Conversion (seconds to minutes).
28317	=	Conversion factor (ft^3 to cc).
F_v	=	LRWPB Exhaust stack flow rate (SCFM). (Default flow rate is 28700 cfm. Other flow rates may be used if required.
B	=	Background (CPM).

This monitor alarms in the Control Room. There are no automatic control functions associated with the actuation of the alarm.

1.5 Simultaneous Release Pathways

1.5.1 Liquid Release Pathways

The liquid radiation monitors (RM054A and B, RM055, and RM055A) control liquid releases so that 10 CFR 20 limits of 1.0E-07 µCi/ml for unidentified isotopes in unrestricted areas are not exceeded. There are two liquid release pathways that contribute to the concentration at discharge to unrestricted areas. These are Steam Generator Blowdown and Monitor Tank Overboard Discharge Header. When more than one pathway is utilized for radioactive releases, it is necessary to adjust the alarm setpoints given in Section 1.2 so that unrestricted area concentration limits are not exceeded.

The calculations for the alarm setpoints for the liquid effluent monitors will be adjusted as follows:

$$A_t = K_o A_o + K_1 A_1$$

$$A_t = \frac{K_o\,(1.0E\text{-}07\ \mu Ci/ml)\,(X_o)}{Y_o} + \frac{K_1\,(1.0E\text{-}07\ \mu Ci/ml)\,(X_o)}{Y_1}$$

Where:

A_t = Sum of individual maximum allowable concentrations for Steam Generator and Monitor Tank prior to dilution for simultaneous liquid releases (µCi/ml)

A_o = Maximum allowable concentration in Steam Generator Blowdown Line (µCi/ml)

A_1 = Maximum allowable concentration in Monitor Tank Discharge Line (µCi/ml)

K_o = Proportionality constant for Steam Generator (See Table 1)

K_1 = Proportionality constant for Monitor Tank (See Table 1)

X_o = Total dilution flow in Discharge Tunnel (GPM)

1.5.1 Liquid Release Pathways (Continued)

Where:

Y_o = Steam Generator Blowdown flowrate (GPM)

Y_1 = Monitor Tank Discharge flowrate (GPM)

The High Alarm Setpoint for Steam Generator Blowdown monitors, RM054A and B, will then be:

$$Alarm\ Setpoint\ (CPM) = .85\ [K_o\ S_{Fo}\ A_o + B_o]$$

The High Alarm Setpoint for Monitor Tank Discharge monitors, RM055 and 55A, will then be:

$$Alarm\ Setpoint\ (CPM) = .85\ [K_1\ S_{F1}\ A_1 + B_1]$$

Where:

S_{Fo} = Detector Sensitivity factor for RM054A/B, CPM/(μCi/ml), based on Cs-137.

S_{F1} = Detector Sensitivity factor for RM055/55A, CPM/(μCi/ml), based on Cs-137.

A_o = Maximum allowable concentration in SG Blowdown line. (μCi/ml)

A_1 = Maximum allowable concentration in MT Discharge line. (μCi/ml)

B_o = RM054 A or B background countrate. (CPM)

B_1 = RM055 or 55A background countrate. (CPM)

1.5.1 Liquid Release Pathways (Continued)

Where:

K_0, K_1 = Proportionality constants. See Table I.

1.5.2 Gaseous Release Pathway

The gaseous radiation monitors (RM041, RM042, RM043, RM057, RM060, RM061, and RM062) control gaseous releases so that 10 CFR 20 limits of 3.0E-07 μCi/cc for gases and 1.0E-10 μCi/cc for iodines and particulates in unrestricted areas are not exceeded. There are three pathways that contribute to the concentration at site boundary. These are the Auxiliary Building Exhaust Stack, Condenser Off-gas, and the LRWPB Exhaust Stack. When more than one pathway is utilized for radioactive releases, it is necessary to adjust the alarm setpoints given in Section 1.4 to ensure that unrestricted area concentration limits are not exceeded.

The calculations for the alarm setpoints for the gaseous effluent monitors will be adjusted as follows:

The maximum allowable release rates for simultaneous releases is:

$$Max.\ Release\ Rate = \sum_{i=0}^{6} K_i R_i = \sum_{i=0}^{6} K_i \frac{Conc_i}{\chi/Q}$$

Where:

R_0 = RM061/RM050 release rate (μCi/sec)
R_1 = RM062/RM051 release rate (μCi/sec)
R_2 = RM060 release rate (μCi/sec)
R_3 = RM057 release rate (μCi/sec)
R_4 = RM041 release rate (μCi/sec)
R_5 = RM042 release rate (μCi/sec)
R_6 = RM043 release rate (μCi/sec)

$K_0 \rightarrow K_6$ = Proportionality constants. See Table 1.

$Conc_i$ = Radionuclide concentration for the monitor of interest.

1.5.2 Gaseous Release Pathway (Continued)

The maximum release rate is then:

$$\left[\frac{K_o(1.0E\text{-}10\ \mu Ci/cc)}{5.0E\text{-}06\ sec/m^3} + \frac{K_1(3.0E\text{-}07\ \mu Ci/cc)}{5.0E\text{-}06\ sec/m^3} + \frac{K_2(1.0E\text{-}10\ \mu Ci/cc)}{5.0E\text{-}06\ sec/m^3} + \right.$$

$$\frac{K_3(3.0E\text{-}07\ \mu Ci/cc)}{5.0E\text{-}06\ sec/m^3} + \frac{K_4(1.0E\text{-}10\ \mu Ci/cc)}{5.0E\text{-}06\ sec/m^3} + \frac{K_5(1.0E\text{-}10\ \mu Ci/cc)}{5.0E\text{-}06\ sec/m^3} +$$

$$\left. \frac{K_6(3.0E\text{-}07\ \mu Ci/cc)}{5.0E\text{-}06\ sec/m^3} \right] 1.0E{+}06\ \frac{cc}{m^3} = Max.\ Release\ Rate$$

The alarm setpoints for the gaseous effluent monitors will then be:

$$RM061/50 = .85\ \left[K_o \frac{(2.0\ E{+}01)\ (S_F)(F_S)(T)}{F_V} + B \right]$$

$$RM062/51 = .85\ \left[K_1 \frac{(6.0\ E{+}04)\ (S_F)(60)}{F_V\ (28317)} + B \right]$$

$$RM060 = .85\ \left[K_2 \frac{(2.0\ E{+}01)\ (S_F)(F_S)(T)(E)}{F_V} + B \right]$$

$$RM057 = .85\ \left[K_3 \frac{(6.0\ E{+}04)\ (S_F)(60)}{(F_V)\ (28317)} + B \right]$$

$$RM041 = .85\ \left[K_4 \frac{(2.0\ E{+}01)\ (S_F)(F_S)(T)}{(F_V)} + B \right]$$

$$RM042 = .85\ \left[K_5 \frac{(2.0\ E{+}01)\ (S_F)(F_S)(T)(E)}{(F_V)} + B \right]$$

$$RM043 = .85\ \left[K_6 \frac{(6.0\ E{+}04)\ (S_F)(60)}{(F_V)\ (28317)} + B \right]$$

Where:

TABLE 3

Radiation and Environmental Monitors
Operability Requirements

A. Liquid Monitors	Daily Channel Check(1)	Monthly Source Check(2)	Quarterly Channel Func. Test(3)	Refueling Calibration(4)	Source Check Prior to Release(5)
RM-054 A/B	X(9)	X	X	X	X
RM-055/55A	-(9)	-	X	X	X

B. Gaseous Monitors	Daily Channel Check(1)	Monthly Source Check(2)	Quarterly Channel Func. Test(3)	Refueling Calibration(4)	Source Check Prior to Release(5)
RM-043	X	X	X	X	-
RM-057	X	X	X	X	-
RM-062/51(6)	X	X	X	X	X

C. Envirnmntl. Monitors	Monthly Operations Check(7)	Annual Airflow Calibration(8)
RM-035 - 039	X	X

NOTES:

(1) Documentation is provided by signoff on OP-ST-SHIFT-0001.

(2) Documentation is provided by signoff on IC-ST-RM-0050.

(3) Documentation is provided by signoff on IC-ST-RM-0050.

(4) Documentation is provided by completion of appropriate calibration procedure. Air or liquid flowrate calibrations must be included for RM-054 A/B and RM-043, RM-057, and RM-062/51.

(5) Documentation is provided by signoff on applicable Release Permit Form

(6) RM-051 will be substituted for RM-062 when it is sampling the Auxiliary Building Ventilation Stack.

(7) Documentation is provided by signoff on IC-ST-RM-0100.

(8) Documentation is provided by completion of calibration procedur.

(9) Visual flowcheck daily

1.5.2 Gaseous Release Pathway (Continued)

.85	=	Correction factor for instrument meter error.
$K_0 \rightarrow K_6$	=	Proportionality contents. See Table 1.
S_F	=	Detector sensitivity factor.
F_S	=	Monitor sample flow rate.
T	=	Effective monitor response time.
E	=	Charcoal filter collection efficiency.
F_V	=	Vent stack flowrate. (Condenser off-gas flowrate for RM057, LRWPB Exhaust stack flow rate for RM041/42/43, Auxiliary Building Exhaust Stack flow rate for RM061/50, 62/51 and 60).
B	=	Monitor background count rate.
60	=	Constant of unit conversion (60 sec/min).

TABLE 1

Proportionally Constants for Simultaneous Release Pathways

a.	Liquid Effluents	$K_0 + K_1 \leq 1$
	K_0 = .30	RM054A/B
	K_1 = .70	RM055/55A
b.	Gaseous Effluents	$\Sigma_i K_i \leq 1$
	K_0 = .05	RM061/50
	K_1 = .40	RM062/51
	K_2 = .35	RM060
	K_3 = .05	RM057
	K_4 = .05	RM041
	K_5 = .05	RM042
	K_6 = .05	RM043

NOTE: The constants are based on prior knowledge and may be updated as necessary to provide for plant operations.

2.0 RADIOACTIVE WASTE TREATMENT SYSTEM

2.1 Liquid Radwaste Treatment System

The major equipment or subsystem(s) of the liquid radwaste treatment system are comprised of the waste filters, monitor tanks, and evaporator. This equipment, including associated pumps, valves and piping, is used in different combinations on an as-needed basis to process the liquid effluent to provide compliance with the as low as is reasonably achievable philosophy and the applicable section of 10 CFR Part 20. The liquid radwaste treatment system is described in Section 11.1.2 of the USAR. For effluent release points and monitor locations refer to P&ID's 11405-M-100, M-9 and M-8.

A filtration/ion exchange (FIX) system may be utilized for processing liquid radwaste in the event the waste evaporator is not in service. The system consists of a booster pump, charcoal pretreatment filter, and pressure vessels containing organic/inorganic resins, which can be configured for optimum performance. The effluent from the FIX system is directed to the monitor tanks for release.

Waste filters (WD-17A and WD-17B) are used only on those occasions when considered necessary, otherwise the flows from the low activity fluids may bypass the filters. No credit for decontamination factors (iodines, Cs, Rb, others) was taken for these filters during the Appendix I dose design objective evaluation; therefore, the inoperability of these filters does not affect the dose contributions to any individual in the unrestricted areas via liquid pathways. The inoperability of waste filters will not be considered a reportable event in accordance with Specification 2.9.1(1)c.

Every effort will be made to process all liquid waste, except from the hotel waste tanks, through the evaporator or FIX before entering the monitor tanks. If the radioactive liquid waste is discharged without processing and it appears that 1/2 of the annual objective will be exceeded during the calendar quarter, a special report shall be submitted to the Commission pursuant to Specification 2.9.1(1)c within 30 days.

The quantity of radioactive material contained in each unprotected outdoor liquid holdup tank shall not exceed 10 curies, excluding tritium and dissolved or entrained noble gases.

2.2 Gaseous Radwaste Treatment System

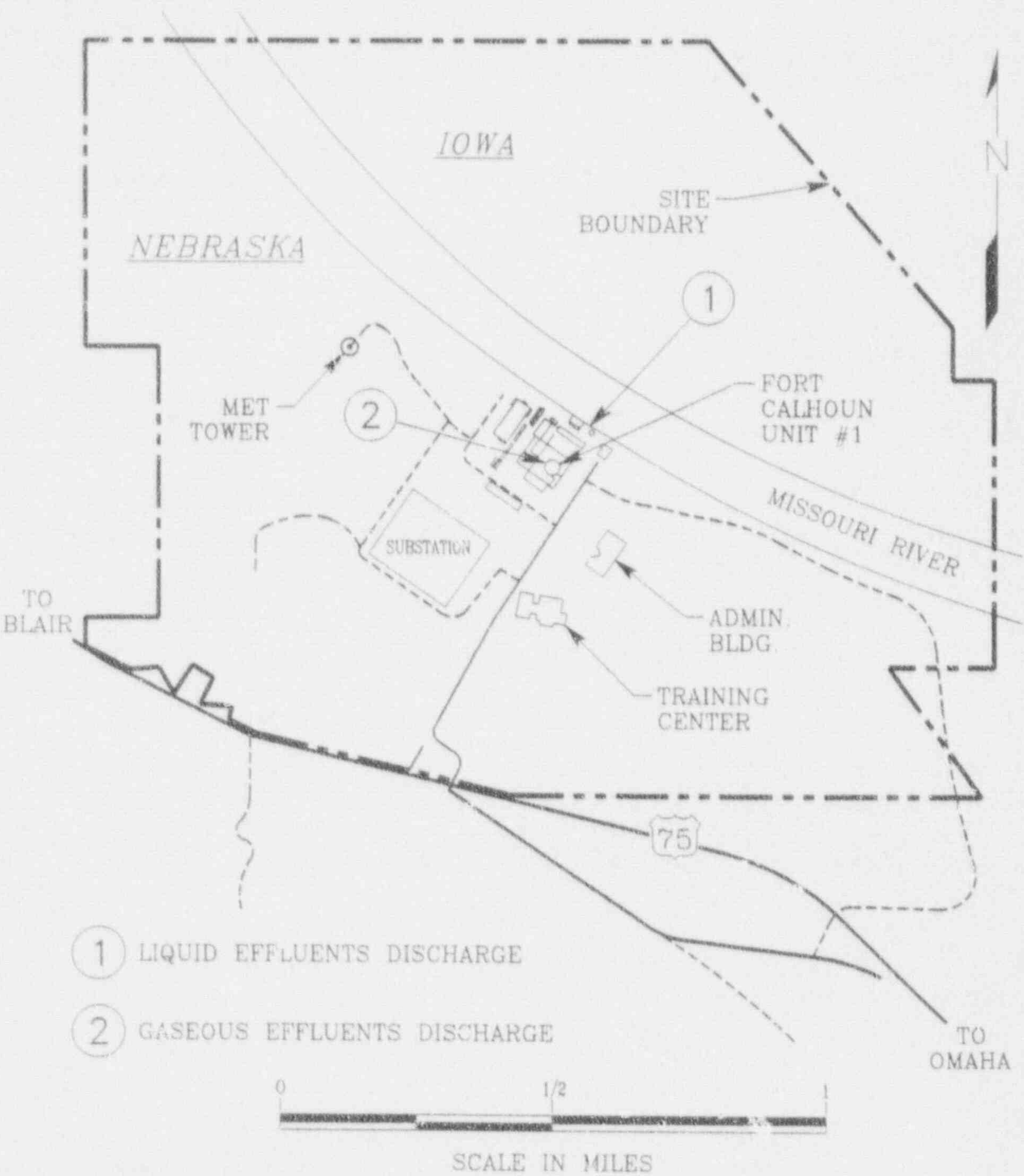
The waste gases at Fort Calhoun Station are collected in the vent header where the gas compressors take suction, compress the gas and deliver it to one of the four gas decay tanks. The waste gases are treated in these gas decay tanks by holding the gases for radioactive decay prior to final controlled release to the environs. In order to provide conformance with the dose design objectives, gas decay tanks are normally stored for approximately 30 days, with earlier release allowed to support plant operation only, and thus achieve decay of short half-life radioactive materials, e.g., I-131, Xe-133. If the radioactive gaseous wastes from the gas decay tanks are discharged without processing in accordance with the above conditions, a special report shall be submitted to the Commission pursuant to Specification 2.9.1(2)c.

The radioactive effluents from the controlled access area of the auxiliary building are filtered by the HEPA filters in the auxiliary building ventilation system. If the radioactive gaseous wastes are discharged without the HEPA filters, a special report shall be submitted to the NRC pursuant to Specification 2.9.1(2)c.

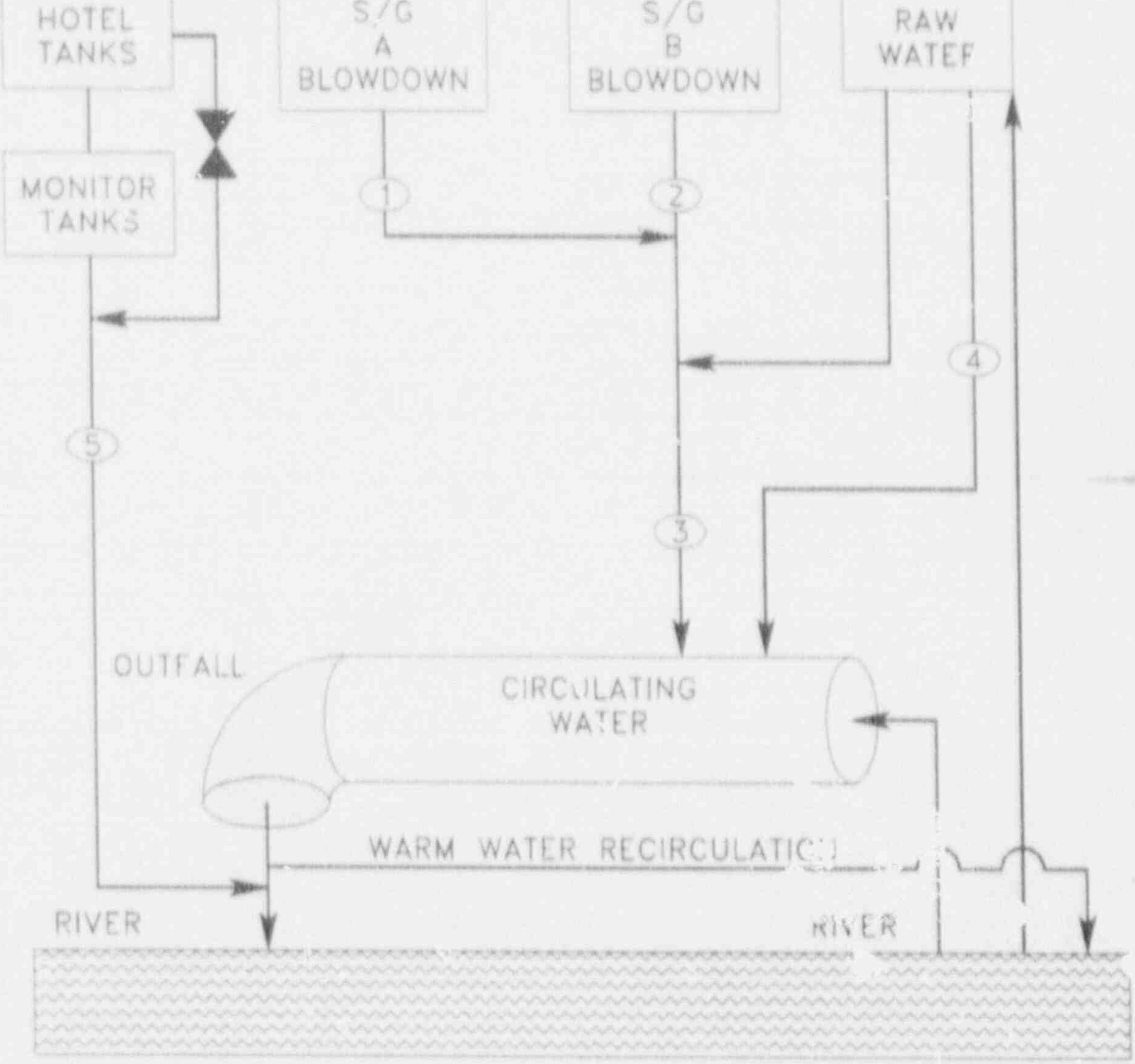
The discharge from the gas decay tanks is routed through charcoal and HEPA filter unit VA-82. No credit was taken for the operation of hydrogen purge filters during the Appendix I dose design evaluation and doses through the gaseous pathways were well below the design objectives. The unavailability of hydrogen purge filters will not be considered a reportable event as per Specification 2.9.1(2)c.

The containment air is processed through at least one of the redundant containment HEPA and charcoal filters in the Containment air Cooling and Filtering Units prior to purging. If the containment purges are made without processing through one of the Containment Air Cooling and Filtering Units, a special report shall be submitted to the Commission pursuant to Specification 2.9.1(2)c.

The gaseous radwaste treatment system is described in Section 11.1.3 of the USAR. For effluent release points and monitor locations refer to P&ID's 11405-M-1 and M-261.

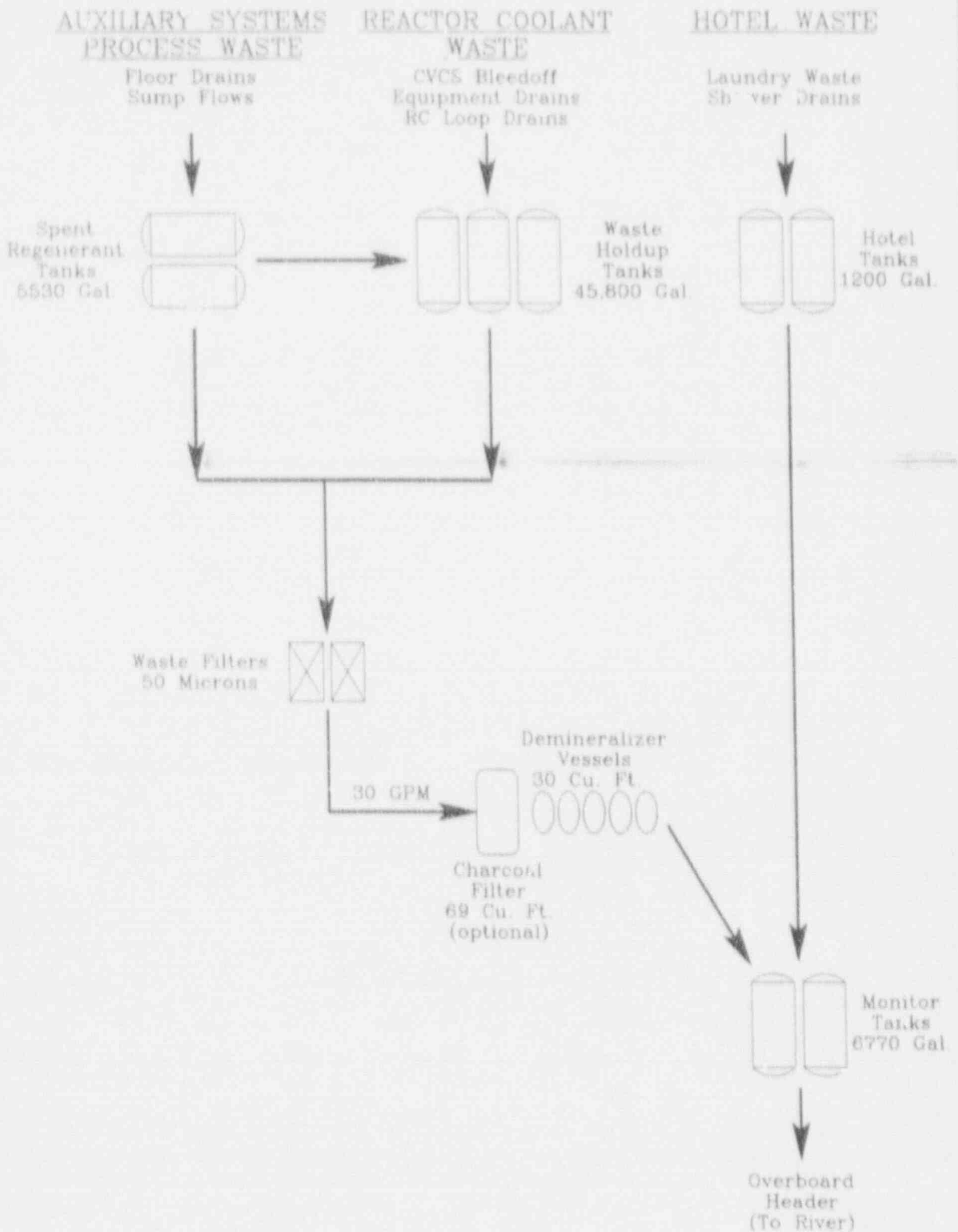


EXCLUSION 4-D SITE BOUNDARY MAP

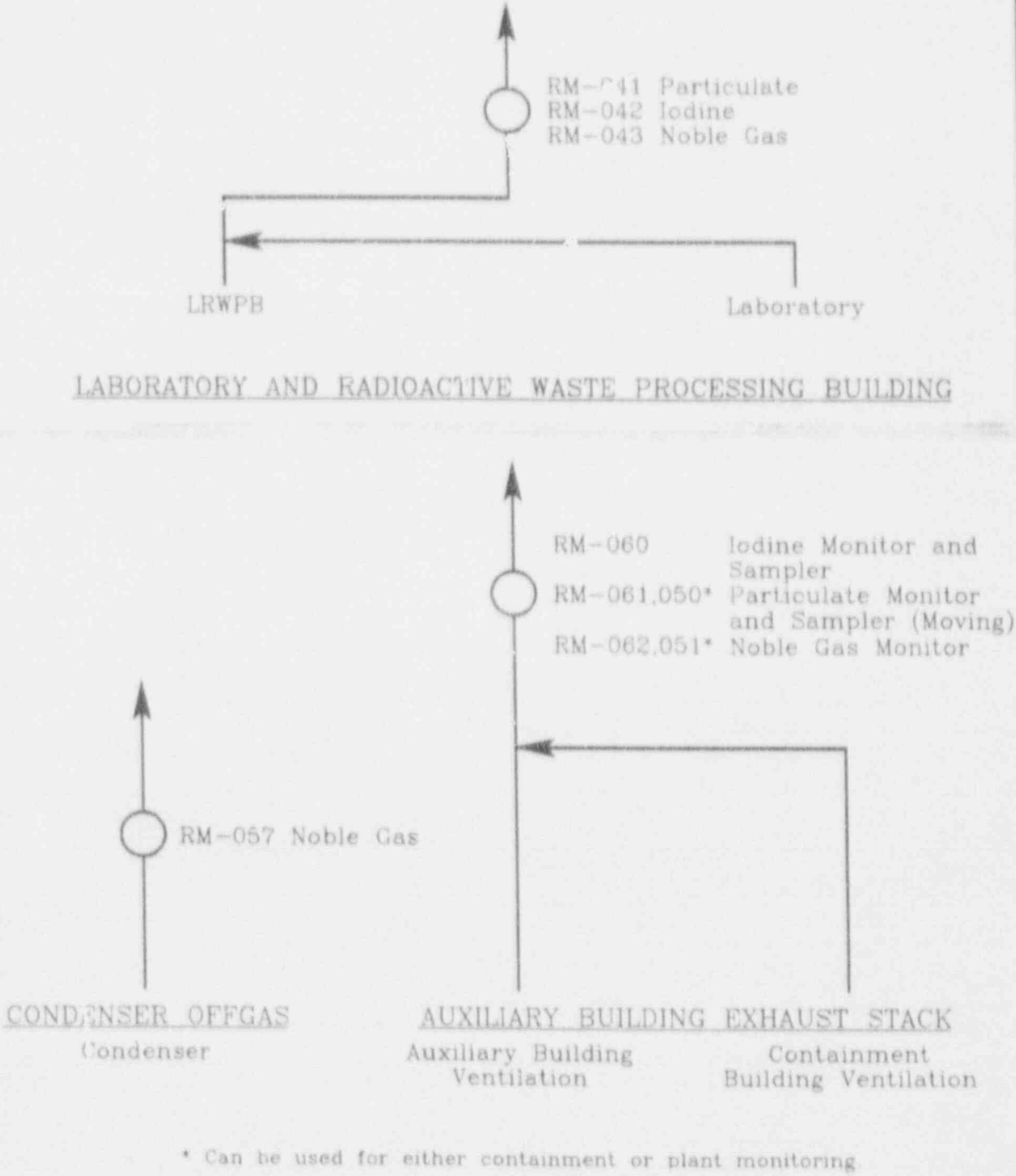


(1) RM-054A
(2) RM-054B
(3) RM-056B
(4) RM-056A
(5) RM-055 AND RM-055A

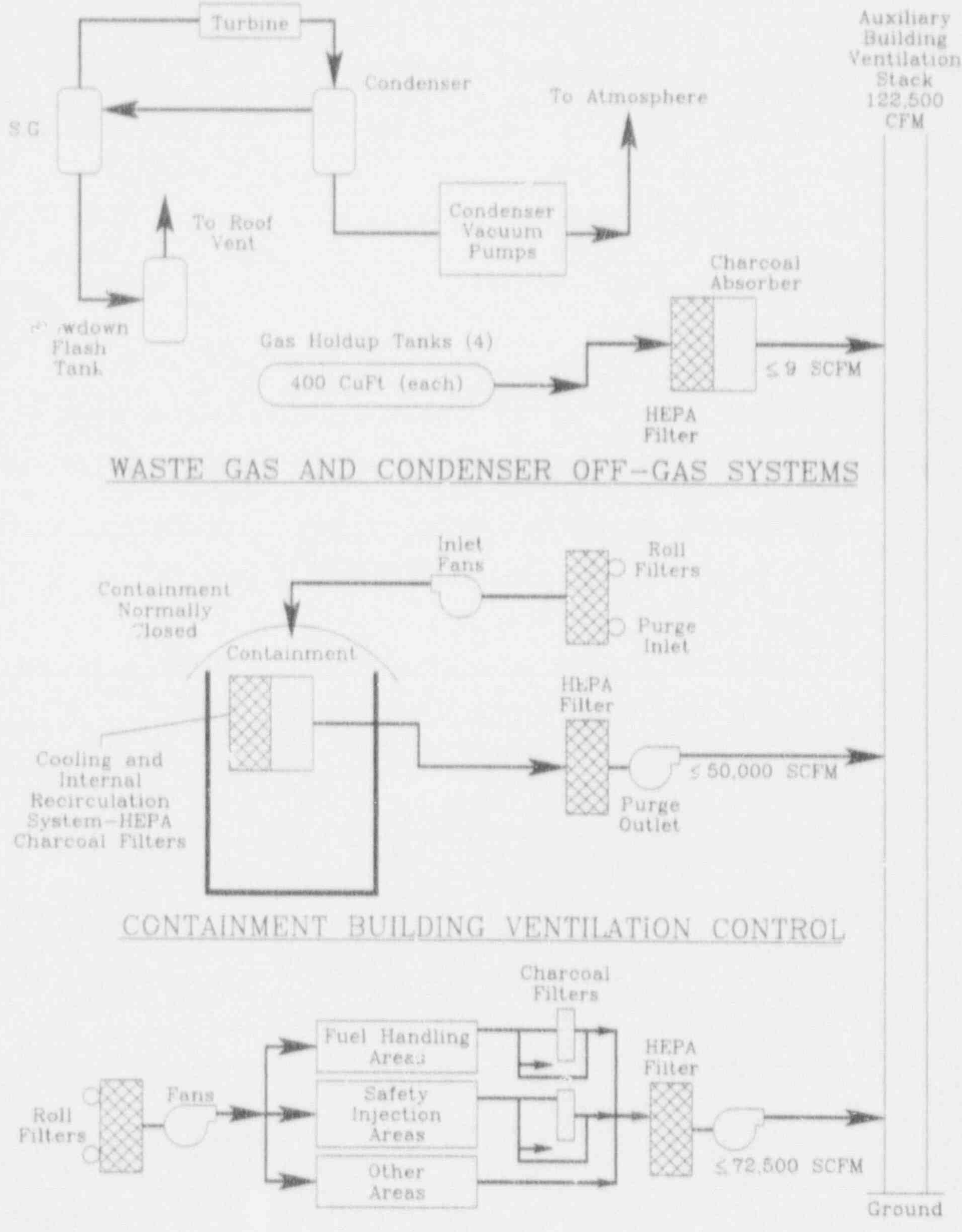
LIQUID RADIOACTIVE DISCHARGE PATHWAYS



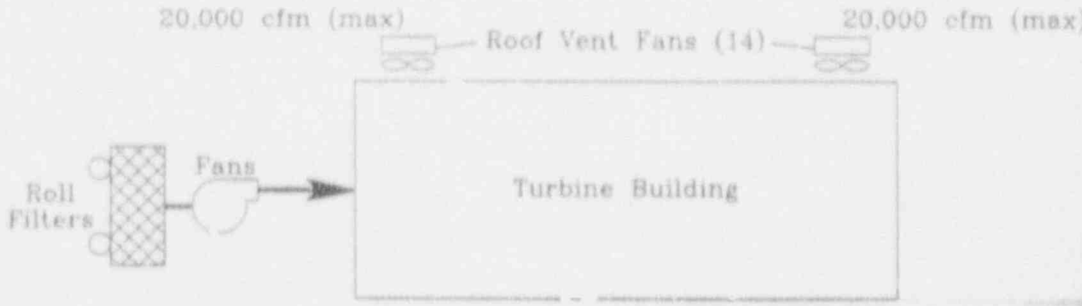
LIQUID RADIOACTIVE WASTE DISPOSAL SYSTEM



GASEOUS RADIOACTIVE DISCHARGE PATHWAYS



GASEOUS RADIOACTIVE WASTE DISPOSAL SYSTEM
page 1 of 2



TURBINE BUILDING VENTILATION CONTROL SYSTEM

GASEOUS RADIOACTIVE WASTE DISPOSAL SYSTEM
page 2 of 2