TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

July 26, 1982

Director of Nuclear Reactor Regulation
Attention: Ms. E. Adensam, Chief
Licensing Branch No. 4
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Ms. Adensam:

In the Matter of the Application of	)	Docket Nos. 50-390
Tennessee Valley Authority	)	50-391

Enclosed is a complete package containing proposed modifications to the draft Watts Bar Radiological Effluent Technical Specifications (RETS). Included with each proposed modification is a marked up page of the NRC draft specification along with a justification for each change. This package addresses the following questions that we received informally from the NRC's Watts Bar standard technical specification reviewer: A.4 (Additional Information Required to Complete Technical Specifications - Question #4), A.5, D.23 (Differences Between the Applicant's Proposal and the NRC Draft Technical Specifications - Question #23), D.29, D.30, D.31, D.32, D.71, D.73, and D.74.

We propose having a meeting with the NRC Licensing Project manager, Standard Technical Specification Branch reviewers, Effluent Treatment Systems Branch reviewers, and any other personnel you deem necessary as soon as possible to fully discuss this submittal. We hope to resolve all issues involving the RETSs during this meeting. In order to allow sufficient time for our submittal to be thoroughly reviewed before the meeting, we suggest an August 24, 1982 meeting date. If another day that week is more suitable for the NRC reviewers, please inform us.

C002B

Director of Nuclear Reactor Regulation July 26, 1982

If you have any questions concerning this matter, please get in touch with D. A. Kulisek at FTS 858-2681.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Licensing

Sworn to and subscribed before me
this 26th day of July 1982

Bryant M. Lowery
Notary Public
My Commission Expires 4/8/86

Enclosure
cc: U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

ENCLOSURE
WATTS BAR NUCLEAR PLANT TECHNICAL SPECIFICATIONS
RELATED TO RADIOLOGICAL EFFLUENTS

Following the TVA submittal of the initial marked up draft of Watts Bar Technical Specifications the NRC issued a first typed draft of the Watts Bar Unit 1 specification. This specification did not include numerous revisions and clarifications we requested to the specifications in the area of Radiological Effluents.

TVA has reviewed the specifications and areas where open items still exist on requirements, surveillances, and wording and has prepared the attached package for resubmittal to the NRC for their review. This package will be the basis for the proposed meeting with the NRC staff to discuss open areas of concern.

This package contains the following elements:

1. Portions of table 3.3-3, table, 3.3-4, and table 4.3-2 (ESF Instrumentation) which cover containment vent isolation features. This equipment is the same as that used in portions of the Radiological Effluent Specifications and should be considered in a comprehensive review of the subject.

2. Specification 3/4.3.3 (Radiation Monitoring Instrumentation) which includes table 3.3-6 and table 4.3-3. Again this specification covers some of the same equipment covered in Specification 3/4.3.3 and Radiological Effluent Specifications.

3. Specification 3/4.3.3.9 (Radiological Liquid Effluent Monitoring Instrumentation)

4. Specification 3/4.3.3.10 (Radiological Gaseous Effluent Monitoring Instrumentation)

5. Specification 3/4.11.1 (Liquid Effluents)

6. Specification 3/4.11.2 (Gaseous Effluents)

7. Specification 3/4.11.3 (Solid Radioactive Waste)

8. Specification 3/4.11.4 (Total Dose)

Also inserted into the package are more detailed justifications and attachments for selected requested changes where more explanation is needed.

Open Item #44, 74
T.S. pages 3/4 3-19, 3/4 3-38

Containment Ventilation Isolation Channels - The Watts Bar design has 6 radiation monitors that will give a containment ventilation isolation signal: 2 purge monitors (each samples both purge trains), upper compartment gas and particulate monitors, and lower compartment gas and particulate monitors. The standard technical specifications require 4 total number of channels with a minimum channels operable requirement of 3. Yet, the NRC draft version of the Watts Bar technical specifications show 6 and 6. We believe that the minimum number of channels operable should be reduced to 1 each.

In addition, we believe the action statement should be revised to allow startup of the unit as long as purging is prohiited if the minimum channels operable requirement is not met. Closing, and keeping closed, the purge valves meets the safety function. The monitors are accessible and can be worked on with the unit at power, or starting up. The present NRC requirement would cause TVA to suffer an economic penalty when no safety problem is involved.

The work 'radioactivity' should be added to item 3.c.5.

References: TVA Drawings 47W610-90-1 R4 (FSAR figure 9.4-12)
47W610-90-3 R5
47W610-30-1 R6 (FSAR figure 9.4-30)

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
CONTAINMENT ISOLATION (Continued)					
c. Containment Ventilation Isolation					
1) Manual	2	1	2	1, 2, 3, 4	17
2) Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	17
3) Containment Gas Monitor Radioactivity-High	2	1	1	1, 2, 3, 4	17 *
4) Safety Injection	See 1 above for all Safety Injection initiating functions and requirements				
5) Containment Particulate Monitor-High Radioactivity	2	1	1	1, 2, 3, 4	17 *
6) Containment Purge Air Exhaust Monitor Radioactivity-High	2	1	1	1, 2, 3, 4	17 *
4. STEAM LINE ISOLATION					
a. Manual	1/steam line	1/steam line	1/operating steam line	1, 2, 3	22
b. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3	20
c. Containment Pressure--High-High	4	2	3	1, 2, 3	16
d. Steam Flow in Two Steam Lines--High	2/steam line	1/steam line any 2 steam lines	1/steam line	1, 2, 3	15*

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
3. CONTAINMENT ISOLATION								
a. Phase "A" Isolation								
1) Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Safety Injection		See 1 above for all Safety Injection Surveillance Requirements						
3) Automatic Actuation Logic and Actuation Relays	N.A	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
b. Phase "B" Isolation								
1) Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
3) Containment Pressure--High-High	S	R	M	N.A.	N.A.	N.A.	N.A.	1, 2, 3
c. Containment Ventilation Isolation								
1) Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
3) Containment Gas Monitor Radioactivity-High	S	R	M	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
4) Safety Injection		See 1 above for all Injection Surveillance Requirements.						
5) Containment Particulate Monitor-High (Radioactivity)	S	R	M	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
6) Containment Purge Air Exhaust Monitor Radioactivity-High	S	R	M	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4

From W-STS

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
CONTAINMENT ISOLATION (continued)					
3) Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	14
b. Phase "B" Isolation					
1) Manual	2	1 with 2 coincident switches	2	1, 2, 3, 4	19
2) Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	14
3) Containment Pressure--High-High	4	2	3	1, 2, 3	17
c. Purge and Exhaust Isolation					
1) Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	18
2) Containment Radioactivity-High	4	2	3	1, 2, 3, 4	18
3) Safety Injection	See 1 above for all Safety Injection initiating functions and requirements				

SEP 15 1981

NRC Question A.4
Open Item #51
T.S. page 3/4 3-28

Containment Ventilation Isolation Setpoints - The setpoints will be variable and calculated from the expected release rate, nuclides present, weather conditions, etc., in accordance with plant procedures and the ODCM. TVA considers this approach better than putting in a maximum setpiont based on 10 CFR 20 limits. In addition, 2 times background has no meaning for a beta monitor because background is so low.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
CONTAINMENT ISOLATION (continued)		
c. Containment Ventilation Isolation		
1. Manual	Not Applicable	Not Applicable
2. Automatic Actuation Logic and Actuation Relays	Not Applicable	Not Applicable
3. Containment Gas Monitor Radioactivity--High	Variable * ~~(≤ 2 x background)~~	Not applicable ~~(≤ 2 x background)~~
4. Safety Injection	See 1 above for all Safety Injection Trip Setpoints/ Allowable Values	
5. Containment Particulate Monitor-High Radioactivity	Variable * ~~later~~	Not applicable ~~later~~
6. Containment Purge Air Exhaust Monitor Radioactivity-High	~~later~~ Variable *	Not applicable ~~later~~
4. STEAM LINE ISOLATION		
a. Manual	Not Applicable	Not Applicable
b. Automatic Actuation Logic and Actuation Relays	Not Applicable	Not Applicable
c. Containment Pressure--High-High	≤ 2.9 psig	≤ 3.0 psig
d. Steam Flow in Two Steam Lines--High	≤ A function defined as follows: A Δp corresponding to 40% of full steam flow between 0% and 20% load and then a Δp increasing linearly to a Δp corresponding to 110% of full steam flow at full load	≤ A function defined as follows: A Δp corresponding to 44% of full steam flow between 0% and 20% load and then a Δp increasing linearly to a Δp corresponding to 111.5% of full steam flow at full load

* Setpoint will be based on release rate, nuclides present, weather conditions etc in accordance with plant procedures and the ODCM as specified in Specification 3.11.2.1.

NRC Questions A.5, D.23
Open Item #76, 77, 79, 80
T.S. page 3/4 3-44, 3/4 3-45, 3/4 3-47, 3/4 3-48

Radiation Monitoring Instrumentation - The entire table 3.3-6 has been reviewed and the following changes made:

1. Containment Purge Air and Control Room Isolation monitors are process monitors, not area monitors. The table has been revised to reflect this. The range is $10-10^7$ cpm.

2. The setpoint for containment purge will be variable and set to ensure compliance with specification 3.11.2.1.

3. The setpoint for control room isolation is 400 cpm above naturally occurring background. This value is based on the MPC for Xe-133 specified in 10 CFR Part 20. The 400 cpm is equivalent to $1x10^{-5}$ µCi/cc Xe-133.

4. The fuel pool area is monitored by G-M tubes. They can isolate the auxiliary building vents. However, the requirements for a criticality monitor have been waived in accordance with 10 CFR Part 70.24.

5. The fuel pool area process monitor was deleted from this table because it is already listed in specification 3.3.3.10 for the auxiliary building vent and specifications 3.7.8 and 3.9.12 for ABGTS initiation signals. Action for 3.9.12 and applicability are the same as required by STS table 3.3-6.

6. High range noble gas effluent monitors are not needed on the purge lines on the auxiliary building vent because: 1) the purge lines isolate on phase A or high radiation, 2) the purge systems exhausts into the shield building vent, 3) the auxiliary building isolates on phase A or high radiation, and 4) the ABGTS exhausts into the shield building vent. The table has been revised accordingly.

References: FSAR Sections 11.4.2.2.3, 11.4.2.2.5, and 11.4.2.2.6

TABLE 3.3-6

RADIATION MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	MEASUREMENT RANGE	ACTION
1. AREA MONITORS					
a. Fuel Storage Pool Area					
~~i. Criticality Monitor~~	1	*	$\leq$ 15 mR/hr	10^{-1} - 10^{4} mR/hr	~~25~~ 27
~~ii. Ventilation System Isolation~~	~~1~~	~~**~~	~~($\leq$ 2 x background)~~	~~(1 - 10^{5}) cpm~~	~~27~~
b. Containment - Purge & Exhaust Isolation	1	6	Variable ** ~~($\leq$ 2 x background)~~	(10 - 10^{7}) cpm ~~(1 - 10^{5}) cpm~~	28
c. Control Room Isolation	1	All MODES	400 cpm above naturally occuring background ~~($\leq$ 2 x background)~~	(10 - 10^{7}) cpm ~~(10^{-1} - 10^{4}) mR/hr~~	29
b ~~d.~~ Containment Area	2	1, 2, 3 & 4	N/A	1-10^{8} rad/hr	30
2. PROCESS MONITORS					
a. ~~Fuel Storage Pool Area Ventilation System Isolation~~					
~~i. Gaseous Activity~~	~~1~~	~~**~~	~~($\leq$ 2 x background)~~	~~(1 - 10^{5}) cpm~~	~~27~~
~~ii. Particulate Activity~~	~~1~~	~~**~~	~~($\leq$ 2 x background)~~	~~(1 - 10^{5}) cpm~~	~~27~~
b. Containment					
i. Gaseous Activity					
a) Purge & Exhaust Isolation	1	6	Variable ** ~~($\leq$ 2 x background)~~	10-10^{7} ~~(1 - 10^{5})~~ cpm	28
b) RCS Leakage Detection	1	1, 2, 3 & 4	N/A	~~(1 - 10^{5})~~ 10-10^{7} cpm	26
ii. Particulate Activity					
a) Purge & Exhaust Isolation	1	6	~~($\leq$ 2 x background)~~	10-10^{7} ~~(1 - 10^{5})~~ cpm	28
b) RCS Leakage Detection	1	1, 2, 3 & 4	N/A	~~(1 - 10^{5})~~ 10-10^{7} cpm	26

2.a 2.c 3/4 3-44

2.c irradiated

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

~~** With irradiated fuel in the storage pool~~

**

TABLE 3.3-6 (Continued)

RADIATION MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	MEASUREMENT RANGE	ACTION
PROCESS MONITORS (Continued)					
d c. Noble Gas Effluent Monitors					
~~i. Auxiliary Building Exhaust System~~	~~1~~	~~1, 2, 3 & 4~~	~~N.A.~~	~~$1-10^3$ uCi/cc~~	~~30~~
i ~~ii.~~ Shield Building Exhaust System	1	1, 2, 3 & 4	N.A.	$1-10^4$ uCi/cc	30
~~iii. Containment Purge & Exhaust System~~	~~1~~	~~1, 2, 3 & 4~~	~~N.A.~~	~~$1-10^5$ uCi/cc~~	~~30~~
ii ~~iv.~~ Condenser Exhaust System	1	1, 2, 3 & 4	N.A.	$1-10^5$ uCi/cc	30

TABLE 4.3-3

RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. AREA MONITORS				
a. Fuel Storage Pool Area				
~~i. Criticality Monitor~~	S	R	M	*
~~ii. Ventilation System Isolation~~	~~S~~	~~R~~	~~M~~	~~**~~
b. Containment - Purge & Exhaust Isolation	S	R	M	6
c. Control Room Isolation	S	R	M	All MODES
~~d.~~ Containment Area	S	R	M	1, 2, 3 & 4
2. PROCESS MONITORS				
~~a. Fuel Storage Pool Area - Ventilation System Isolation~~				
~~i. Gaseous Activity~~	~~S~~	~~R~~	~~M~~	~~**~~
~~ii. Particulate Activity~~	~~S~~	~~R~~	~~M~~	~~**~~
b. Containment				
i. Gaseous Activity				
a) Purge & Exhaust Isolation	S	R	M	6
b) RCS Leakage Detection	S	R	M	1, 2, 3, & 4
ii. Particulate Activity				
a) Purge & Exhaust Isolation	S	R	M	6
b) RCS Leakage Detection	S	R	M	1, 2, 3, & 4

2.a
2.c
b
B/4 3-47
2.c

~~*With fuel in the storage pool or building.~~

**With irradiated fuel in the storage pool.

TABLE 4.3-3 (Continued)

RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
PROCESS MONITORS (Continued)				
d c. Noble Gas Effluent Monitors				
~~i. Auxiliary Building Exhaust System~~	~~S~~	~~R~~	~~M~~	~~1, 2, 3 & 4~~
i ~~ii~~. Shield Building Exhaust System	S	R	M	1, 2, 3 & 4
~~iii. Containment Purge & Exhaust System~~	~~S~~	~~R~~	~~M~~	~~1, 2, 3 & 4~~
ii ~~iv~~. Condenser Exhaust System	S	R	M	1, 2, 3 & 4

Open Item #293
T.S. page 3/4 3-74, 3/4 3-82, 3/4 11-1, 3/4 11-8

Action Statements for Inoperable Effluent Monitors and Missed Sampling Assignments - The requirement to report each radioactive effluent radiation monitor failure and each sampling requirement that is missed should be deleted. The radiation monitors (many in number) are not the most reliable equipment. The sampling program is extensive. Breakdowns in equipment constitute a great number of licensing event reports (LERs). Missed sampling requirements are not an infrequent event. Both of these types of reports are of little value and tend to mask the more important LERs by their sheer number. Deleting this reporting requirement will not reduce the amount of protection provided by the radiological effluent monitoring program. It will reduce the number of insignificant reports that clog up the LER system. This will allow both TVA and NRC to concentrate review on the more serious events or breakdowns. The NRC (C. A. Willis, Branch Chief of the Effluent Treatment Systems Branch) agrees with the basis for deleting these reporting requirements.

References: Memorandum from D. Harward to AIF Subcommittee on Radiological Effluent Technical Specifications dated December 24, 1981. Letter from C. A. Willis (NRC/ETSB) to Dr. Sudhakar Pandey, Franklin Research Center, dated November 20, 1981.

INSTRUMENTATION

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.9 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.3-12 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.1.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined in accordance with the OFFSITE DOSE CALCULATION MANUAL (ODCM).

APPLICABILITY: At all times.

ACTION:

a. With a radioactive liquid effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above specification, immediately suspend the release of radioactive liquid effluents monitored by the affected channel or declare the channel inoperable.

b. With 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.

d. The provisions of Specification 6.9.1.13.b are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.9 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION and ANALOG CHANNEL OPERATIONAL TEST operations at the frequencies shown in Table 4.3-8.

INSTRUMENTATION

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.10 The radioactive gaseous effluent monitoring instrumentation channels shown in Table 3.3-13 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specifications 3.11.2.1 and 3.11.2.5 are not exceeded. The alarm/trip setpoints of these channels meeting specification 3.11.2.1 shall be determined in accordance with the ODCM.

APPLICABILITY: As shown in Table 3.3-13

ACTION:

a. With a radioactive gaseous effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above Specification, immediately suspend the release of radioactive gaseous effluents monitored by the affected channel or declare the channel inoperable.

b. With less than the minimum number of radioactive gaseous effluent monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 3.3-13.

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

d. The provisions of Specification 6.9.1.13.b are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.10 Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION and ANALOG CHANNEL OPERATIONAL TEST operations at the frequencies shown in Table 4.3-9.

3/4.11 RADIOACTIVE EFFLUENTS

3/4.11.1 LIQUID EFFLUENTS

CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.11.1.1 The concentration of radioactive material released from the site (see Figure 5.1-1) shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2×10^{-4} microcuries/ml total activity.

APPLICABILITY: At all times.

ACTION:

a. With the concentration of radioactive material released from the site exceeding the above limits, immediately restore the concentration to within the above limits.

b. The provisions of Specification 6.9.1.13.b are not applicable for late or missed sampling requirements.

SURVEILLANCE REQUIREMENTS

4.11.1.1.1 The radioactivity content of each batch of radioactive liquid waste shall be determined prior to release by sampling and analysis in accordance with Table 4.11-1. The results of pre-release analyses shall be used with the calculational methods in the ODCM to assure that the concentration at the point of release is maintained within the limits of Specification 3.11.1.1.

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

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

RADIOACTIVE EFFLUENTS

3/4.11.2 GASEOUS EFFLUENTS

DOSE RATE

LIMITING CONDITION FOR OPERATION

3.11.2.1 The dose rate due to radioactive materials released in gaseous effluents from the site (see Figure 5.1-1) shall be limited to the following:

a. For noble gases: Less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin, and

b. For all radioactive material (radioiodines, ~~and for all~~ radioactive materials in particulate form and radionuclides other than noble gases) with half lives greater than 8 days: Less than or equal to 1500 mrem/yr to any organ.

APPLICABILITY: At all times.

ACTION:

a. With the dose rate(s) exceeding the above limits, immediately decrease the release rate to within the above limit(s).

b. The provisions of Specification 6.9.1.13.b are not applicable for late or missed sampling requirements.

SURVEILLANCE REQUIREMENTS

4.11.2.1.1 The dose rate due to noble gases in gaseous effluents shall be determined to be within the above limits in accordance with the methods and procedures of the ODCM.

4.11.2.1.2 The dose rate due to radioactive materials, other than noble gases, in gaseous effluents shall be determined to be within the above limits in accordance with the methods and procedures of the ODCM by obtaining representative samples and performing analyses in accordance with the sampling and analysis program specified in Table 4.11-2.

Atomic Industrial Forum, Inc.
7101 Wisconsin Avenue
Washington, D.C. 20014
Telephone: (301) 654-9260
Cable: Atomforum Washingtondc

E. David Harward
Environmental Projects Manager

December 24, 1981

To: AIF Subcommittee on Radiological Effluent Technical Specifications

Enclosed for your information are copies of the following:

1. Letter from Charles Willis of NRC staff dated November 20, 1981 to their RETS contractors.

2. Summary of November 10, 1981 meeting written by EG&G, Idaho.

3. Paper by Charles Willis and Frank Congel of NRC on RETS presented at AIF conference on NEPA and Nuclear Regulation: Operating License Issues in October, 1981.

4. Copy of NRC Radiological Assessment Branch Technical Position on Environmental Monitoring Programs.

NRC staff has reinstituted implementation of the RETS for operating nuclear power plants. The enclosed documents should bring you up to date on the status of these efforts and some recent changes that were made by the staff following the November 10 meeting. Your particular attention is invited to the fact that the P-32 requirement has been dropped. We have prepared a draft AIF summary for the November 10 meeting with NRC but I have not yet received comments from the NRC staff. This will be forwarded as soon as possible for your information.

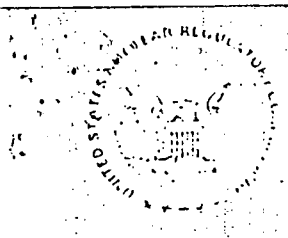
There have been several suggestions that the full Subcommittee meet in early 1982 for the purpose of exchanging information and to discuss major issues with the NRC staff. We will determine if such a meeting is feasible and keep you advised. Please give me a call if you have any questions.

Sincerely,

Dave Harward

EDH:pl

Enclosures



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 20, 1981

Dr. Sudhakar Pandey
Franklin Research Center
Benjamin Franklin Parkway
at Twentieth
Philadelphia, Pennsylvania 19103

Dear Dr. Pandey,

As a result of our recent meeting with the Atomic Industrial Forum working group, it has been decided that the following changes could be made in the RETS requirements.

First, the requirement of 3.11.2.3 to account for doses from C-14 may be dropped. Our data show that C-14 will not make a significant contribution to the doses.

Second, the requirement of 3.11.2.1 for limiting dose rates from airborne releases of radioiodines and particulates may be limited to the inhalation pathway only. This specification is intended to ensure compliance with the 20.106 limits which are maximum permissible concentrations based on inhalation (and submersion) doses.

Third, the requirements of 3.11.1.2, 3.11.2.2, and 3.11.2.3 for reporting, etc., when an offsite dose exceeds one half an annual design objective in one quarter, may be changed to require consideration of doses during the remainder of the calendar year (rather than "the subsequent three calendar quarters"). This change is consistent with the requirements of Appendix I which are based on the calendar year.

Fourth, action provisions may be added that reduce reporting requirements other than those specified in the model RETS. For plants with standard Tech Specs, this may be achieved by adding an action statement such as: "The provisions of Specification 6.9.1.9.b are not applicable". That Specification requires thirty day written reports whenever a plant is operating in a degraded mode permitted by the Tech Specs. The exemption offered here is intended to reduce the number of essentially valueless reports about inoperable instruments and the like. For plants which do not have standard Tech Specs, corresponding exemptions may be developed on a case by case basis.

~~8201050380~~

Fifth, the requirements of 4.11.1.1 for monitoring liquid effluents for P-32 may be omitted. A recent NRC-sponsored study has shown that the bio-accumulation factor for this relatively short-lived nuclide is substantially less than was previously assumed. Consequently, P-32 cannot be a major contributor to offsite doses.

Sincerely,

Charles A. Willis

Charles A. Willis, Leader, Section B
Effluent Treatment Systems Branch
Division of Systems Integration
Office of Nuclear Reactor Regulation

cc: F. Simpson (EG&G)
D. Harwood (AIF)
R. Ireland (NRC/Idaho)

NRC Question D.29
Open Item #90
T.S. page 3/4 3-77

Liquid Effluent Instrumentation Table Notation

Action 32 - The analysis requirement was revised to read either 'gross radioactivity beta or gamma.' TVA plans to do a gross gamma on a NaI well counter or a gross beta on a gas proportional counter at Watts Bar. This scheme allows some flexibiity for inoperable equipment or backlogged work.

The isotopic analyses that will be performed are gamma isotopics only.

Action 33 - The analysis requirement was revised to read either 'gross radioactivity beta or gamma' for the same reason listed above. TVA also wants the capability to perform the gamma isotopic analysis in lieu of the gross gamma or beta analyses at Watts Bar.

TABLE 3.3-12 (Continued)

TABLE NOTATION

ACTION 31 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases 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 4.11.1.1.1, 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 32 - 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 ~~and~~ or gamma at a limit of detection of at least 10^{-7} microcuries/ml; or the gamma isotopic analysis is performed with LLD's as given in Table 4.11-1:

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 33 - 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 ~~and~~ or gamma at a limit of detection of at least 10^{-7} microcuries/ml; or the gamma isotopic analysis is performed with LLD's as given in Table 4.11-1.

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 the flow rate is estimated at least once per 4 hours during actual releases. Pump curves may be used to estimate flow.

ACTION 35 - 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.

NRC Question D.30
Open Item #91
T.S. page 3/4 3-79

Liquid Effluent Instrumentation Surveillance Requirements - The instrument descriptions have been revised to be consistent with table 3.3-12. The source check requirements for the liquid radwaste effluent monitor and the condensate demineralizer effluent monitor have been revised to be performed monthly. The number of releases from both of these lines will be large. In fact, it will be essentially continuous releases. Requiring source checks before each batch will be excessive. Daily channel checks and review of monitor response to predicted readings should be sufficient to indicate monitor operability between monthly source checks. Sequoyah Nuclear Plant technical specifications require monthly source checks.

TABLE 4.3-8

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST
1. GROSS ~~BETA OR GAMMA~~ RADIOACTIVITY MONITORS PROVIDING ~~ALARM AND~~ AUTOMATIC TERMINATION OF RELEASE				
a. Liquid Radwaste Effluent Line	D	P M	R(3)	Q(1)
b. Steam Generator Blowdown Effluent Line	D	M	R(3)	Q(1)
c. Condensate Demineralizer Effluent Line	D	P M	R(3)	Q(1)
2. GROSS ~~BETA OR GAMMA~~ RADIOACTIVITY MONITORS ~~PROVIDING ALARM BUT~~ NOT PROVIDING AUTOMATIC TERMINATION OF RELEASE				
a. Essential Raw Cooling Water Effluent Line	D	M	R(3)	Q(2)
b. Turbine Building Sump Effluent Line	D	M	R(3)	Q(2)
3. FLOW RATE MEASUREMENT DEVICES				
a. Liquid Radwaste Effluent Line	D(4)	N.A.	R	Q
b. Steam Generator Blowdown Effluent Line	D(4)	N.A.	R	Q
c. Condensate Demineralizer Effluent Line	D(4)	N.A.	R	Q
d. Diffuser Discharge Effluent Line	D(4)	N.A.	R	Q
4. TANK LEVEL INDICATING DEVICES				
a. Condensate Storage Tank	D*	N.A.	R	Q
b. Steam Generator Layup Tank	D*	N.A.	R	N.A.

NRC Question D.31
Open Item #93, 94, 97
T.S. page 3/4 3-81, 3/4 3-88

Table 4.3-8,9, Table Notation - The function switches on the radiation monitors are spring loaded to return to the 'operate' mode. They will not remain in any other mode unless held by hand. Because of the design, alarm annunciation is not provided for the switch out of the 'operate' mode. This is true for notes (1) and (2).

We propose the addition of channel calibrations related to NBS traceable standards. One case where this could occur is outlined below.

> The vendor decides to update his calibration technique and develops new sources that have been related to NBS sources. Even if the new technique for calibration is better than the initial calibration, without our proposed wording, TVA would be forced to continue to use the initial calibration sources instead of the better, new technique.

TABLE 4.3-8 (Continued)

TABLE NOTATION

* During liquid additions to the tank.

(1) The ANALOG CHANNEL OPERATIONAL 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.
3. Instrument indicates downscale failure.
4. ~~Instrument controls not set in operate mode.~~

(2) The ANALOG CHANNEL OPERATIONAL 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.
3. Instrument indicates downscale failure.
4. ~~Instrument controls not set in operate mode.~~

(3) The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards shall permit calibrating the system over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration shall be used. or NBS traceable sources

(4) CHANNEL CHECK shall consist 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 4.3-9 (Continued)

TABLE NOTATION

* At all times.

** During waste gas disposal system operation.

*** During shield building exhaust system operation.

**** During waste gas releases.

(1) The ANALOG CHANNEL OPERATIONAL 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.
3. Instrument indicates a downscale failure.
4. ~~Instrument controls not set in operate mode.~~

(2) The ANALOG CHANNEL OPERATIONAL 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.
3. Instrument indicates a downscale failure.
4. ~~Instrument controls not set in operate mode.~~

(3) The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards shall permit calibrating the system over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration shall be used.

(4) The CHANNEL CALIBRATION shall include the use of standard gas samples or NBS traceable sources 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.

NRC Question D.32
Open Item #95
T.S. page 3/4 3-85

Gaseous Effluent Instrumentation Table Notation -

Action 37a - The phrase 'in accordance with Table 4.11-2' has been added to clarify the types of analyses to be performed and the sensitivity required (LLD).

Action 39 - The word 'gross' has been added to the noble gas activity analysis requirement. Depending of the time and equipment available TVA will perform either a gross noble gas activity count or an isotopic analysis at Watts Bar.

Hydrogen and Oxygen Monitor Action Statement - The requirement to shut down the reactor if both the hydrogen and oxygen monitors on the Waste Gas System are inoperable is both excessive and unsafe. An explosion in a waste gas decay tank would not affect safe operation of the plant. The waste gas monitoring system requirements should not be tied to reactor operation. Requiring a reactor shutdown because of monitor problems will compound the problem. The plant will not remain at pressure for extended periods of time. Depressurization will lead to off-gassing and hydrogen addition to the Waste Gas System at a time when the monitors are inoperable. Clearly, this is not a desirable operation.

TABLE 3.3-13 (Continued)

TABLE NOTATION

* At all times.

** During waste gas disposal system operation.

*** During shield building exhaust system operation.

ACTION 37 - 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 in accordance with Table 4.11-2

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 38 - 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 39 - 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 noble ~~gas~~ gross activity or an isotopic analysis is performed with LLD's as given in Table 4.11-2 within 24 hours.

ACTION 40 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, operation of this waste gas disposal system may continue for up to 7 days provided grab samples are collected at least once per 4 hours and analyzed within the following 4 hours to meet the requirements of specification 3.11.2.5. ~~With the hydrogen and oxygen monitors inoperable, be in at least HOT STANDBY within 6 hours.~~

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 that within 4 hours after the channel has been declared inoperable samples are continuously collected with auxiliary sampling equipment as required in Table 4.11-2.

Open Item #210, 210.1 through 210.6
T.S. page 3/4 11-2, 3/4 11-4

Liquid Sampling Table - The following changes were made to this table.

1. Laundry and hot shower tanks were added to the radwaste system batch releases.

2. Waste evaporator blowdown tank was incorrectly placed under the radwaste system batch releases. This tank is not part of the Condensate Demineralizer System.

3. The high crud and nonreclaimable waste tanks were moved under the Condensate Demineralizer System batch release. These tanks will be sampled and analyzed in one of two ways: either as a batch release or as a quasi-continuous release. Footnote g has been revised to reflect the expected operation. The periodic continuous release section has been deleted.

4. A separate column to address sample type has been added to clarify the requirements.

5. The benefit of collecting field composites is not clear. A grab sample and continuous radiation monitoring is preferable. Decay corrections are difficult to make for field composites. TVA intends to use grab samples and continuous radiation monitoring at Watts Bar.

6. The turbine building sump sampling requirement has been deleted. The sump at Watts Bar does not release directly to the river. Instead, it releases to a 35-acre holding pond. The sump effluent is monitored by a radiation monitor.

Radioactive Liquid Waste Sampling and Analysis Program - The requirement to analyze for P-32 in liquid waste effluent samples should be deleted. The bio-accumulation factor for this relatively short-lived nuclide is substantially less than was previously assumed. Consequently, P-32 cannot be a major contributor to offsite doses. The analysis for P-32 is difficult and expensive. To get accurate results a highly skilled technician, familiar with the technique is required. P-32 is a pure beta emitter and, as such, special sample preparation is required to separate and count the sample. The analysis takes between 6 to 8 hours and is subject to considerable error. Typical practice is to count the sample, wait a period of time and recount it. The two results, corrected for decay, are compared. Because of the difficulty and expense

involved, the analysis should be avoided when not needed. The NRC (C. A. Willis, Branch Chief of the Effluent Treatment Systems Branch) agrees with the basis for deleting this analysis requirement. Fe-55 should be deleted for similar reasons.

References:

Memorandum from D. Harward to AIF Subcommittee on Radiological Effluent Technical Specifications, dated December 24, 1981

Letter from C. A. Willis (NRC/ETSB) to Dr. Sudhakar Pandey, Franklin Research Center, dated November 20, 1981.

TABLE 4.11-1

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

Liquid Release Type	Sampling Frequency	Minimum Analysis Frequency	Sample Type	Type of Activity Analysis	Lower Limit of Detection (LLD) (μCi/ml)[a]
A. Batch Releases[d]	P	P			
1. Radwaste System Tanks Waste Condensate (3) Cask Decontamination(1) Chemical Drain (1) Monitor (1) Distillate(2) Laundry and Hot Shower(2) Waste Evaporator Blowdown (1)	Each Batch	Each Batch	Grab or Composite[g]	Principal Gamma Emitters	5×10^{-7}[f]
				I-131	1×10^{-6}
	P One Batch/M	M	Grab	Dissolved and Entrained Gases (Gamma emitters)	1×10^{-5}
2. Condensate Demineralizer System Tanks Waste Neutralizer (1) Waste Evaporator Blowdown Tank Non-Reclaimable Waste (2) High Crud (2)	P Each Batch	M Lab Composite[c]	Composite[bc]	H-3	1×10^{-5}
				Gross Alpha	1×10^{-7}
				P-32	1×10^{-6}
	P Each Batch	Q Lab Composite[c]	Composite[bc]	Sr-89, Sr-90	5×10^{-8}
				Fe-55	1×10^{-6}
B. Continuous Releases[e]					
1. Steam Generator Blowdown	Field Composite[b] W	W	Grab	Principal Gamma Emitters	5×10^{-7}[f]
				I-131	1×10^{-6}
2. Turbine Bldg. Sump	Grab Sample M	M	Grab	Dissolved and Entrained Gases (Gamma Emitters)	1×10^{-5}
	Field Composite W	Lab Composite of Field Composites[bc] M	Composite[bc]	H-3	1×10^{-5}
				Gross Alpha	1×10^{-7}
				P-32	1×10^{-6}
	Field Composite[b] W	Lab Composite of Field Composites[bc] Q	Composite[bc]	Sr-89, Sr-90	5×10^{-8}
				Fe-55	1×10^{-6}

TABLE 4.11-1 (Continued)

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 typical effluents, not applicable to primary or sample).

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 sample 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.

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. 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 released.

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/or 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, shall also be identified and reported.

(g) Releases from these tanks are continuously composited during releases. With the composite sampler or the sampler flow monitor inoperable, the sampling frequency shall be changed to require representative batch samples from each tank to be released to be taken prior to release and manually composite for these analyses.

g. Where operational occurrences preclude release from a tank on a batch basis; (e.g., the tank will have an input flow during the release), releases from these tanks are continuously composited during releases or grab samples shall be periodically collected during the release, composited proportional to the quantity of liquid waste discharged following the release and the composite sample analyzed in a timely manner for the type of activity analyses set forth in Table 4.11-1.

Atomic Industrial Forum, Inc.
7101 Wisconsin Avenue
Washington, D.C. 20014
Telephone: (301) 654-9260
Cable: Atomforum Washingtondc

E. David Harward
Environmental Projects Manager

December 24, 1981

To: AIF Subcommittee on Radiological Effluent Technical Specifications

Enclosed for your information are copies of the following:

1. Letter from Charles Willis of NRC staff dated November 20, 1981 to their RETS contractors.

2. Summary of November 10, 1981 meeting written by EG&G, Idaho.

3. Paper by Charles Willis and Frank Congel of NRC on RETS presented at AIF conference on NEPA and Nuclear Regulation: Operating License Issues in October, 1981.

4. Copy of NRC Radiological Assessment Branch Technical Position on Environmental Monitoring Programs.

NRC staff has reinstituted implementation of the RETS for operating nuclear power plants. The enclosed documents should bring you up to date on the status of these efforts and some recent changes that were made by the staff following the November 10 meeting. Your particular attention is invited to the fact that the P-32 requirement has been dropped. We have prepared a draft AIF summary for the November 10 meeting with NRC but I have not yet received comments from the NRC staff. This will be forwarded as soon as possible for your information.

There have been several suggestions that the full Subcommittee meet in early 1982 for the purpose of exchanging information and to discuss major issues with the NRC staff. We will determine if such a meeting is feasible and keep you advised. Please give me a call if you have any questions.

Sincerely,

Dave Harward

EDH:pl

Enclosures

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 20, 1981

Dr. Sudhakar Pandey
Franklin Research Center
Benjamin Franklin Parkway
at Twentieth
Philadelphia, Pennsylvania 19103

Dear Dr. Pandey,

As a result of our recent meeting with the Atomic Industrial Forum working group, it has been decided that the following changes could be made in the RETS requirements.

First, the requirement of 3.11.2.3 to account for doses from C-14 may be dropped. Our data show that C-14 will not make a significant contribution to the doses.

Second, the requirement of 3.11.2.1 for limiting dose rates from airborne releases of radioiodines and particulates may be limited to the inhalation pathway only. This specification is intended to ensure compliance with the 20.106 limits which are maximum permissible concentrations based on inhalation (and submersion) doses.

Third, the requirements of 3.11.1.2, 3.11.2.2, and 3.11.2.3 for reporting, etc., when an offsite dose exceeds one half an annual design objective in one quarter, may be changed to require consideration of doses during the remainder of the calendar year (rather than "the subsequent three calendar quarters"). This change is consistent with the requirements of Appendix I which are based on the calendar year.

Fourth, action provisions may be added that reduce reporting requirements other than those specified in the model RETS. For plants with standard Tech Specs, this may be achieved by adding an action statement such as: "The provisions of Specification 6.9.1.9.b are not applicable". That Specification requires thirty day written reports whenever a plant is operating in a degraded mode permitted by the Tech Specs. The exemption offered here is intended to reduce the number of essentially valueless reports about inoperable instruments and the like. For plants which do not have standard Tech Specs, corresponding exemptions may be developed on a case by case basis.

Fifth, the requirements of 4.11.1.1 for monitoring liquid effluents for P-32 may be omitted. A recent NRC-sponsored study has shown that the bio-accumulation factor for this relatively short-lived nuclide is substantially less than was previously assumed. Consequently, P-32 cannot be a major contributor to offsite doses.

Sincerely,

Charles A. Willis

Charles A. Willis, Leader, Section B
Effluent Treatment Systems Branch
Division of Systems Integration
Office of Nuclear Reactor Regulation

cc: F. Simpson (EG&G)
D. Harwood (AIF)
R. Ireland (NRC/Idaho)

Open Item #210.7, 211
T.S. page 3/4 11-3, 3/4 11-4

Liquid Effluent Sampling Table Notation - The lower limit of detection is expressed in terms of μCi/ml. Note 'a' has been revised to include the appropriate units:

LLD in μCi/ml
E in counts per transformation
V in milliliters (ml)
Y is dimensionless. It equals 1.0 if a radiochemical separation has not been performed.

The mathematical definition of standard deviation has been added for clarification:

$$S_b = \sqrt{\text{background counting rate}}$$

Other minor changes are made for clarification

TABLE 4.11-1 (Continued)

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]
C. Periodic Continuous Releases[e]	Continuous[g]	W Composite[c]	Principal Gamma Emitters[f]	5×10^{-7}
1. Non-Reclaimable Waste Tank (2)	M[g] Grab Sample	M	I-131	1×10^{-6}
			Dissolved and Entrained Gases (Gamma Emitters)	1×10^{-5}
2. High Crud Tank (2)	Continuous[g]	M Composite[c]	H-3	1×10^{-5}
			Gross Alpha	1×10^{-7}
			P-32	1×10^{-6}
	Continuous[g]	Q Composite[c]	Sr-89, Sr-90	5×10^{-8}
			Fe-55	1×10^{-6}

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) (in microcuries per milliliter).

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), and is defined as: $s_b = \sqrt{\text{Background Counting Rate}}$

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

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

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

Y is the fractional radiochemical yield (when applicable), factor (unitless). If a radiochemical separation is not performed, Y = 1.0.

TABLE 4.11-1 (Continued)

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 typical grab samples, it is one hour).

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 a blank sample (as appropriate) rather than on an unverified theoretically predicted variance. Typical values of E, V, Y, and Δt shall be used in the calculation.

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. 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 released.

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 tank 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. shall also be identified and reported.

Eg. Releases from these tanks are continuously composited during releases. With the composite sampler or the sampler flow monitor inoperable, the sampling frequency shall be changed to require representative batch samples from each tank to be released to be taken prior to release and manually composite for these analyses.

g. Where operational occurrences preclude release from a tank on a batch basis; (e.g., the tank will have an input flow during the release), releases from these tanks are continuously composited during releases or grab samples shall be periodically collected during the release, composited proportional to the quantity of liquid waste discharged following the release and the composite sample analyzed in a timely manner for the type of activity analyses set forth in Table 4.11-1.

Open Item #211.1, 217.1, 218, 218.1
T.S. page 3/4 11-5, 3/4 11-12, 3/4 11-13

Dose Specifications - These specifications have been revised to reflect that doeses are tabulated per calendar year. These changes are consistent with Appendix I to 10 CFR Part 50.

References: Memorandum from D. Harward to AIF Subcommittee on Radiological Effluent Technical Specifications, dated December 24, 1981. Letter from C. A. Willis (NRC/ETSB) to Dr. Sudhakar Pandey, (Franklin Research Center), dated November 20, 1981.

RADIOACTIVE EFFLUENTS

DOSE

LIMITING CONDITION FOR OPERATION

3.11.1.2 The dose or dose commitment to an individual from radioactive materials in liquid effluents released from the site (see Figure 5.1-1) shall be limited to the following*:

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

b. During any calendar year to less than or equal to 3 mrem to the total body and to less than or equal to 10 mrem to any organ.

APPLICABILITY: At all times.

ACTION:

a. With the calculated dose from the release of radioactive materials in liquid effluents exceeding any of the above limits, in lieu of any other report required by Specification 6.9.1, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions to be taken to reduce the releases of radioactive materials in liquid effluents during the remainder of the current calendar quarter and during the ~~subsequent three calendar quarters~~ remainder of the calendar year, so that the cumulative dose or dose commitment to an individual from these releases is within 3 mrem to the total body and 10 mrem to any organ. This Special Report shall also include (1) the results of radiological analyses of the drinking water source and (2) the radiological impact on finished drinking water supplies with regard to the requirements of 40 CFR 141, Safe Drinking Water Act.

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

SURVEILLANCE REQUIREMENTS

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

*Per reactor unit

RADIOACTIVE EFFLUENTS

DOSE - NOBLE GASES

LIMITING CONDITION FOR OPERATION

3.11.2.2 The air dose due to noble gases released in gaseous effluents from the site (see Figure 5.1-1) shall be limited to the following*:

a. During any calendar quarter: Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation and,

b. During any calendar year: Less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

APPLICABILITY: At all times.

ACTION

a. With the calculated air dose from radioactive noble gases in gaseous effluents exceeding any of the above limits, in lieu of any other report required by Specification 6.9.1, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions to be taken to reduce the releases of radioactive noble gases in gaseous effluents during the remainder of the current calendar quarter and during the ~~subsequent three calendar quarters~~ remainder of the calendar year, so that the cumulative dose is within 10 mrad for gamma radiation and 20 mrad for beta radiation.

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

SURVEILLANCE REQUIREMENTS

4.11.2.2 Dose Calculations Cumulative dose contributions for the current calendar quarter and current calendar year shall be determined in accordance with the ODCM at least once per 31 days.

*Per reactor unit.

RADIOACTIVE EFFLUENTS

DOSE - RADIOIODINES, RADIOACTIVE MATERIALS IN PARTICULATE FORM, AND RADIONUCLIDES OTHER THAN NOBLE GASES

LIMITING CONDITION FOR OPERATION

3.11.2.3 The dose to an individual from radioiodines, ~~and~~ radioactive materials in particulate form, and radionuclides ~~other~~ other than noble gases) with half-lives greater than 8 days in gaseous effluents released from the site (see Figure 5.1-1) shall be limited to the following*:

a. During any calendar quarter: Less than or equal to 7.5 mrem to any organ and,

b. During any calendar year: Less than or equal to 15 mrem to any organ.

APPLICABILITY: At all times.

ACTION:

a. With the calculated dose from the release of radioiodines, radioactive materials in particulate form, or radionuclides ~~other~~ other than noble gases) with half lives greater than 8 days, in gaseous effluents exceeding any of the above limits, in lieu of any other report required by Specification 6.9.1, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report which identifies the cause(s) for exceeding the limit and defines the corrective actions to be taken to reduce the releases of radioiodines, ~~and~~ radioactive materials in particulate form, and radionuclides ~~other~~ other than nobles gases) with half-lives greater than 8 days in gaseous effluents during the remainder of the current calendar quarter and during the ~~subsequent three calendar quarters~~, so that the cumulative dose or dose commitment to an individual from these releases is within 15 mrem to any organ.

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

SURVEILLANCE REQUIREMENTS

4.11.2.3 Dose Calculations Cumulative dose contributions for the current calendar quarter and current calendar year shall be determined in accordance with the ODCM at least once per 31 days.

*Per reactor unit.

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E. David Harward
Environmental Projects Manager

December 24, 1981

To: AIF Subcommittee on Radiological Effluent Technical Specifications

Enclosed for your information are copies of the following:

1. Letter from Charles Willis of NRC staff dated November 20, 1981 to their RETS contractors.

2. Summary of November 10, 1981 meeting written by EG&G, Idaho.

3. Paper by Charles Willis and Frank Congel of NRC on RETS presented at AIF conference on NEPA and Nuclear Regulation: Operating License Issues in October, 1981.

4. Copy of NRC Radiological Assessment Branch Technical Position on Environmental Monitoring Programs.

NRC staff has reinstituted implementation of the RETS for operating nuclear power plants. The enclosed documents should bring you up to date on the status of these efforts and some recent changes that were made by the staff following the November 10 meeting. Your particular attention is invited to the fact that the P-32 requirement has been dropped. We have prepared a draft AIF summary for the November 10 meeting with NRC but I have not yet received comments from the NRC staff. This will be forwarded as soon as possible for your information.

There have been several suggestions that the full Subcommittee meet in early 1982 for the purpose of exchanging information and to discuss major issues with the NRC staff. We will determine if such a meeting is feasible and keep you advised. Please give me a call if you have any questions.

Sincerely,

Dave Harward

EDH:pl

Enclosures

UNITED STATES
NUCLEAR REGULATORY COMMISSION

November 20, 1981

Dr. Sudhakar Pandey
Franklin Research Center
Benjamin Franklin Parkway
at Twentieth
Philadelphia, Pennsylvania 19103

Dear Dr. Pandey,

As a result of our recent meeting with the Atomic Industrial Forum working group, it has been decided that the following changes could be made in the RETS requirements.

First, the requirement of 3.11.2.3 to account for doses from C-14 may be dropped. Our data show that C-14 will not make a significant contribution to the doses.

Second, the requirement of 3.11.2.1 for limiting dose rates from airborne releases of radioiodines and particulates may be limited to the inhalation pathway only. This specification is intended to ensure compliance with the 20.106 limits which are maximum permissible concentrations based on inhalation (and submersion) doses.

Third, the requirements of 3.11.1.2, 3.11.2.2, and 3.11.2.3 for reporting, etc., when an offsite dose exceeds one half an annual design objective in one quarter, may be changed to require consideration of doses during the remainder of the calendar year (rather than "the subsequent three calendar quarters"). This change is consistent with the requirements of Appendix I which are based on the calendar year.

Fourth, action provisions may be added that reduce reporting requirements other than those specified in the model RETS. For plants with standard Tech Specs, this may be achieved by adding an action statement such as: "The provisions of Specification 6.9.1.9.b are not applicable". That Specification requires thirty day written reports whenever a plant is operating in a degraded mode permitted by the Tech Specs. The exemption offered here is intended to reduce the number of essentially valueless reports about inoperable instruments and the like. For plants which do not have standard Tech Specs, corresponding exemptions may be developed on a case by case basis.

Fifth, the requirements of 4.11.1.1 for monitoring liquid effluents for P-32 may be omitted. A recent NRC-sponsored study has shown that the bio-accumulation factor for this relatively short-lived nuclide is substantially less than was previously assumed. Consequently, P-32 cannot be a major contributor to offsite doses.

Sincerely,

Charles A. Willis

Charles A. Willis, Leader, Section B
Effluent Treatment Systems Branch
Division of Systems Integration
Office of Nuclear Reactor Regulation

cc: F. Simpson (EG&G)
D. Harwood (AIF)
R. Ireland (NRC/Idaho)

NRC Question D.71
Open Item #213
T.S. page 3/4 11-7

Liquid Holdup Tanks - The phrase 'radioactive material' is extremely broad. TVA intends to verify this limit with a gamma scan (gross gamma or gamma isotopic) at Watts Bar. The phrase 'gamma emitting nuclides' is more correct for our application.

RADIOACTIVE EFFLUENTS

LIQUID HOLDUP TANKS

LIMITING CONDITION FOR OPERATION

3.11.1.4 The quantity of ~~radioactive material~~ gamma emitting nuclides contained in each of the following tanks shall be limited by the following expression:

$$\sum_i \frac{\text{concentration of isotope } i}{\text{maximum permissible concentration of isotope } i} \leq \text{~~6,700~~ } 9200$$

excluding tritium and dissolved or entrained noble gases.

a. Condensate Storage Tank
b. Steam Generator Layup Tank
c. Outside temporary tanks for radioactive liquid

APPLICABILITY: At all times.

ACTION:

a. With the quantity of ~~radioactive material~~ gamma emitting nuclides in any of the above listed tanks 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

4.11.1.4 The quantity of ~~radioactive material~~ gamma emitting nuclides 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.

Open Item #215, 218
T.S. page 3/4 11-8, 3/4 11-13

Gaseous Doses - This change is proposed to clarify the requirement, in particular, that the eight-day half life limit applies to radioiodines and particulates also.

RADIOACTIVE EFFLUENTS

3/4.11.2 GASEOUS EFFLUENTS

DOSE RATE

LIMITING CONDITION FOR OPERATION

3.11.2.1 The dose rate due to radioactive materials released in gaseous effluents from the site (see Figure 5.1-1) shall be limited to the following:

a. For noble gases: Less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin, and

b. For all (radioiodines, ~~and for all~~ radioactive materials in particulate form and radionuclides other than noble gases) with half lives greater than 8 days: Less than or equal to 1500 mrem/yr to any organ.

radioactive material

APPLICABILITY: At all times.

ACTION:

a. With the dose rate(s) exceeding the above limits, immediately decrease the release rate to within the above limit(s).

b. The provisions of Specification 6.9.1.13.b are not applicable for late or missed sampling requirements.

SURVEILLANCE REQUIREMENTS

4.11.2.1.1 The dose rate due to noble gases in gaseous effluents shall be determined to be within the above limits in accordance with the methods and procedures of the ODCM.

4.11.2.1.2 The dose rate due to radioactive materials, other than noble gases, in gaseous effluents shall be determined to be within the above limits in accordance with the methods and procedures of the ODCM by obtaining representative samples and performing analyses in accordance with the sampling and analysis program specified in Table 4.11-2.

RADIOACTIVE EFFLUENTS

DOSE - RADIOIODINES, RADIOACTIVE MATERIALS IN PARTICULATE FORM, AND RADIONUCLIDES OTHER THAN NOBLE GASES

LIMITING CONDITION FOR OPERATION

3.11.2.3 The dose to an individual from (radioiodines, ~~and~~ radioactive materials in particulate form, and radionuclides ~~other~~ other than noble gases) with half-lives greater than 8 days in gaseous effluents released from the site (see Figure 5.1-1) shall be limited to the following*:

a. During any calendar quarter: Less than or equal to 7.5 mrem to any organ and,

b. During any calendar year: Less than or equal to 15 mrem to any organ.

APPLICABILITY: At all times.

ACTION:

a. With the calculated dose from the release of (radioiodines, radioactive materials in particulate form, or radionuclides ~~other~~ other than noble gases) with half lives greater than 8 days, in gaseous effluents exceeding any of the above limits, in lieu of any other report required by Specification 6.9.1, prepare and submit to the Commission within 30 days, pursuant to Specification 6.9.2, a Special Report which identifies the cause(s) for exceeding the limit and defines the corrective actions to be taken to reduce the releases of (radioiodines, ~~and~~ radioactive materials in particulate form, and radionuclides ~~other~~ other than nobles gases) with half-lives greater than 8 days in gaseous effluents during the remainder of the current calendar quarter and during the ~~subsequent three calendar quarters~~, so that the cumulative dose or dose commitment to an individual from these releases is within 15 mrem to any organ.

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

SURVEILLANCE REQUIREMENTS

4.11.2.3 Dose Calculations Cumulative dose contributions for the current calendar quarter and current calendar year shall be determined in accordance with the ODCM at least once per 31 days.

*Per reactor unit.

NRC Question D.73
Open Item #216, 216.1, 217
T.S. page 3/4 11-9, 3/4 11-10, 3/4 11-11

Gaseous Waste Sampling and Analysis Program - TVA is proposing a complete revision to this section over the Sequoyah Nuclear Plant program. We have two-years experience with the Sequoyah program and have evaluated the strong points and weak points. We believe this proposal is more efficient and realistic. In addition it expresses the requirements more clearly.

Point 1 - It is not clear why NRC has required analysis for I-133 when this isotope isn't included in the dose calculations specified in specification 3.11.2.1.b because it has a half life less than eight days. Using the continuous charcoal sampler for I-133 analysis does not lead to valid results because of extreme decay correction. We propose to analyze for I-133 once per week from a grab sample. Footnote k has been added for this fact.

Point 2 - It is not clear what the correct sensitivity requirement for I-131 is. The NRC table lists both 10^{-11} and 10^{-12} µCi/ml (see NRC item D for I-131 and principal gamma emitters (I-131, others)).

Point 3 - The format of the table has been revised to clearly identify release source and type, sample frequency, analysis frequency, sample type, and type of activity analysis. It is clearer to the plant personnel to use this format rather than NRC's which mixes many items under each column heading. Also, it is better to distinguish principal gamma emitters as nobel gases, iodines, or particulates. Footnote g has been revised to be consistent with the table format. The distinction between gamma emitters has been placed under 'type of activity analysis' rather than 'release type.'

Point 4 - ABGTS operation was added under batch release along with footnote m. The auxiliary building exhaust is continously sampled and monitored as indicated in table 4.11-2. When ABGTS is operated for testing, it draws air from the auxiliary building and exhausts through the shield building vent. This type of release will be estimated based on the concentrations present in the auxiliary building and the relative system flow rates. The auxiliary building concentrations will be known through the sampling program. The relative flow rates are 9000 cfm for ABGTS and 288,000 for general auxiliary building exhaust. However, if ABGTS starts on auxiliary building isolation (i.e., a radiation problem) grab samples will be taken within one hour of isolation and every 24 hours thereafter. The sampling will be done at the shield building vent.

Point 5 - The lower limit of detection should be expressed in µCi/cc not µCi/ml. The units for LLD, V, E, and Y have been revised to be consistent with µCi/cc. The mathematical definition of standard deviation has been added for clarification.

Point 6 - The waste gas decay tanks, ABGTS, and containment purge all release through the shield building vent. Grab sampling will be done at the source or the shield building vent depending on convenience. The iodine and particulate composite continuous samplers will be installed at the shield building vent. However, the samplers are not proportional.

Point 7 - TVA has tentatively included the requirement for a pre-release tritium analysis for the gas decay tanks at Watts Bar. However, we have reservations about this requirement to setup a temporary tritium trap at the tanks and recirculate highly radioactive gases outside the tank. TVA would like to discuss this matter with the NRC.

Point 8 - Note b has been revised. Power levels, startups and shutdowns have a minimal effect on releases from a continuous release path. An enormous amount of time is involved in sampling and analyzing at the NRC proposed frequency. It detracts from other important samples. We consider it much more productive to initiate sampling when a radiation monitor indicates a moderate unexplained increase. The trigger level would be based on a conservative allowance (dependent on the normal count rate) and operational experience.

Point 9 - Note d has been revised. The first part was redundant to frequency notation in the table. The latter portion was deleted for the reasons outlined in point 8. Note L provides the requirement to sample on an unexplained increase in radiation levels.

Point 10- Note g has been revised to clarify its intent. 'Gaseous emissions' has been replaced with 'noble gases.' I-131 has been removed from the table and added to the footnote to indicate the LLD specification applies and that it is part of the list of principal gamma emitters.

Point 11- Footnote h has been revised to address the fact that purging will be an intermittent rather than continuous process. Containment purging and waste decay tank releases will be treated as batch releases. Sampling for containment releases will be performed once per day if containment readings are stable. The proposed wording also addresses continuous purges that will take place in MODE 5.

Point 12- Note i has been revised to clarify the intent only.

Point 13- The table has been revised to remove the continuous release monitors from 'release type.' The entire purpose of that section was to specify the LLDs for the monitors. Footnote j now specifies the LLDs for continuous release monitors.

TABLE 4.11-2

RADIOACTIVE GASEOUS WASTE MONITORING SAMPLING AND ANALYSIS PROGRAM

Gaseous Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) (μCi/ml)[a]
A. Waste Gas Storage Tank	P Each Tank Grab Sample	P Each Tank	Principal Gamma Emitters[g]	1×10^{-4}
B. Containment Purge	P[i] Each Purge Grab Sample	D[i] Each Purge	Principal Gamma Emitters[g]	1×10^{-4}
			H-3	1×10^{-6}
C. Noble Gases and Tritium 1. Condenser Vacuum Exhaust[h] 2. Auxiliary Building Exhaust[b,e] 3. Service Building Exhaust 4. Shield Building Exhaust[b,c,h]	M Grab Sample	M	Principal Gamma Emitters[g]	1×10^{-4}
			H-3	1×10^{-6}
D. Iodine and Particulates 1. Auxiliary Building Exhaust 2. Shield Building Exhaust	Continuous[f] Sampler	W[d] Charcoal Sample	I-131	1×10^{-12}
			I-133	1×10^{-10}
	Continuous[f] Sampler	W[d] Particulate Sample	Principal Gamma Emitters[g] (I-131, Others)	1×10^{-11}
	Continuous[f] Sampler	M Composite Particulate Sample	Gross Alpha	1×10^{-11}
	Continuous[f] Sampler	Q Composite Particulate Sample	Sr-89, Sr-90	1×10^{-11}
E. Noble Gases all Releases types as listed in A, B, and C above	Continuous[f] Monitor	Noble Gas Monitor	Noble Gases Gross Beta or Gamma	1×10^{-6}

TABLE 4.11-2

RADIOACTIVE GASEOUS WASTE MONITORING SAMPLING AND ANALYSIS PROGRAM

GASEOUS RELEASE TYPE	SAMPLING FREQUENCY	MINIMUM ANALYSIS FREQUENCY	SAMPLE TYPE	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD) (uCi/cc) [a]
A. BATCH RELEASES					
1. Waste Gas Storage Tank 2. Containment Purge [c,h,i] or vent 3. ABGTS [m]	P Each Release	P Each Release	Grab	Noble Gases [j]	$1X10^{-4}$ [g]
				H-3	$1X10^{-6}$
	Continuous [f] during release	Each [d] Release	Charcoal	I-131	$1X10^{-12}$
				I-133	$1X10^{-10}$
			Particulate	Principal Gamma Emitters	$1X10^{-11}$ [g]
		M	Composite Particulate	Gross Alpha	$1X10^{-11}$
		Q	Composite Particulate	Sr-89, Sr-90	$1X10^{-11}$
B. CONTINUOUS RELEASES					
1. Auxiliary Building [e]	M [b]	M	Grab	Noble Gases [j]	$1X10^{-4}$ [g]
				H-3	$1X10^{-6}$
	Continuous [f, k]	W [d,l]	Charcoal	I-131	$1X10^{-12}$
				I-133	$1X10^{-10}$
			Particulate	Principal Gamma Emitters	$1X10^{-11}$ [g]
		M	Composite Particulate	Gross Alpha	$1X10^{-11}$
		Q	Composite Particulate	Sr-89, Sr-90	$1X10^{-11}$
2. Condenser Vacuum Exhaust 3. Service Building Exhaust	M [b]	M	Grab	Noble Gases [j]	$1X10^{-4}$ [g]
				H-3	$1X10^{-6}$

3/4 11-9

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~~ (in microcuries per cubic centimeter ~~or microcuries per unit mass or volume~~),

s_b is the standard deviation of the sample background counting rate or of the counting rate of a blank sample as appropriate (~~as~~ counts per minute), and is defined as: $s_b = \sqrt{\text{Background Counting Rate}}$

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

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

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

Y is the fractional radiochemical yield ~~(when applicable)~~, factor (unitless). If a radiochemical separation is not performed, Y = 1.0.

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 sample background counting rate or of the counting rate of ~~a~~ 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.

TABLE 4.11-2 (Continued)

TABLE NOTATION

b. see insert
~~Analyses shall also be performed following shutdown from ≥15% RATED THERMAL POWER, startup to ≥15% RATED THERMAL POWER or a THERMAL POWER change exceeding 15 percent of RATED THERMAL POWER within a one hour period~~.

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

d. ~~Samples shall be changed at least once per 7 days and~~ Analyses shall be completed within 48 hours after changing (or after removal from sampler). ~~Sampling shall also be performed at least once per 24 hours for at least 2 days following each shutdown from ≥15% RATED THERMAL POWER, startup to ≥15% RATED THERMAL POWER or THERMAL POWER change exceeding 15% 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 ~~to are~~ the following radionuclides: Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, and Xe-138 for ~~gaseous emissions~~ noble gases and Mn-54, Fe-59, I-131 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

(principal gamma emitters)

h. see insert
~~During releases via this exhaust system.~~

i. see insert
~~In MODES 1, 2, 3 and 4, the upper and lower compartments of the containment shall be sampled prior to VENTING or PURGING. Prior to entering MODE 5, the upper and lower compartments of the containment shall be sampled. The incore instrument room purge sample shall be obtained at the shield building exhaust between 5 and 10 minutes following initiation of the incore instrument room purge.~~

j. see insert

k. see insert

l. see insert

m. see insert

INSERTS FOR TABLE 4.11-2

b. The noble gas analyses shall also be performed following a deviation of more than a predetermined amount from an established norm in the noble gas continuous vent monitor reading.

h. Sampling and analyses for containment purge or vent releases shall be performed no more than once per day unless the containment gas radiation monitors show a deviation of more than a predetermined amount from an established norm. If a containment release continues past seven days, initiate the same sampling and analyses of the release at the Shield Building Exhaust Monitor as indicated for the Auxiliary Building Exhaust.

i. Applicable in MODES 1, 2, 3, and 4. The containment shall be sampled prior to breaking CONTAINMENT INTEGRITY in MODES 5 and 6. The incore instrument room purge sample shall be obtained at the shield building exhaust between 5 and 10 minutes following initiation of the incore instrument room purge.

j. The noble gases from all release types shall be continuously monitored, at a LLD of 1×10^{-6} µci/cc.

k. A charcoal grab sample shall be taken at least once per week and analyzed for I-133.

l. Charcoal and particulate sampling and analyses shall also be performed following a deviation of more than a perdetermined amount from the established norm for the charcoal or particulate continuous vent monitor readings.

m. With the auxiliary building isolated, e.g. the ABGTS in operation with exhaust via the shield building vent, grab samples shall be taken at least once per 24 hours at the shield building vent monitor during the release.

Open Item #219
T.S. page 3/4 11-14

Gaseous Radwaste Treatment System - This specification has been revised to match decay tank treatment with noble gas dose and organ dose with radioactive materials (other than noble gases) with half lives greater than eight days. These changes were made for clarification.

RADIOACTIVE EFFLUENTS

GASEOUS RADWASTE TREATMENT

LIMITING CONDITION FOR OPERATION

3.11.2.4 The GASEOUS RADWASTE TREATMENT SYSTEM and the VENTILATION EXHAUST TREATMENT SYSTEM shall be OPERABLE. The appropriate portions of the GASEOUS RADWASTE TREATMENT SYSTEM shall be used to reduce ~~radioactive materials~~ noble gases in gaseous waste prior to their discharge when the projected gaseous effluent air doses due to ~~gaseous effluent~~ noble gases releases from the site (see Figure 5.1-1), 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 5.1-1) when averaged over 31 days would exceed 0.3 mrem to any organ.* from radioactive material (other than noble gases) with half-lives greater than 8 days.

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 15 minutes, at least once per 92 days unless the appropriate system has been utilized to process radioactive gaseous effluents during the previous 92 days.

*These doses are per reactor unit.

NRC Question D.71, D.74
Open Item 212, 221
T.S. page 3/4 11-7, 3/4 11-16

Liquid Holdup Tank Content - The MPC limit for Watts Bar is <9200. It is based on a plant specific analysis. It is predicted that the worst case liquid tank release of 376,000 gallons (condensate storage tank) will be diluted by a factor of 9,200 before reaching a public water supply intake (Dayton, Tennessee). Based on this value, the sum of the ratios of concentration to maximum permissible concentration may be as high as 9,200 without potentially exceeding a ratio of 1 at the public water supply due to a tank rupture.

Gas Decay Tank Content - The curie limit for the gas decay tank is 67,000 Ci. It is based on a plant specific analysis. The limit of 67,000 curies is the noble gas activity that would result in 500 mrem to the total body at the exclusion area boundary in the event of a waste gas decay tank rupture. Total release of tank contents (Xe-133 equivalent) is assumed over a two-hour period with fifth-percentile meteorology.

Gas Decay Tanks - TVA wants to confirm with the NRC that the requirements are limited to noble gases. Tritium, SR-89 Cs-137, etc., are excluded as well as radioiodines.

RADIOACTIVE EFFLUENTS

LIQUID HOLDUP TANKS

LIMITING CONDITION FOR OPERATION

3.11.1.4 The quantity of ~~radioactive material~~ gamma emitting nuclides contained in each of the following tanks shall be limited by the following expression:

$$\sum_i \frac{\text{concentration of isotope } i}{\text{maximum permissible concentration of isotope } i} \leq \text{~~6,700~~ } 9200$$

excluding tritium and dissolved or entrained noble gases.

a. Condensate Storage Tank
b. Steam Generator Layup Tank
c. Outside temporary tanks for radioactive liquid

APPLICABILITY: At all times.

ACTION:

a. With the quantity of ~~radioactive material~~ gamma emitting nuclides in any of the above listed tanks 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

4.11.1.4 The quantity of ~~radioactive material~~ gamma emitting nuclides 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.

RADIOACTIVE EFFLUENTS

GAS DECAY TANKS

LIMITING CONDITION FOR OPERATION

3.11.2.6 The quantity of radioactivity contained in each gas decay tank shall be limited to less than or equal to ~~50,000~~ 67,000 curies of noble gases (considered as Xe-133).

APPLICABILITY: At all times.

ACTION:

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

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

SURVEILLANCE REQUIREMENTS

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

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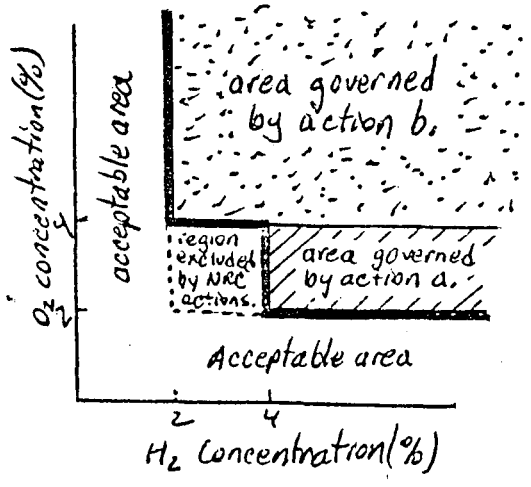
Explosive Gas Mixture Action Statements - Action statement 'a' requires that when the concentration of 0_2 exceeds 2 percent by volume but is less than 4 percent by volume, we must reduce the 0_2 concentration to the limits specified in the LCO (0_2 less than or equal to 2 percent when H_2 exceeds 4 percent). Our interpretation is that the 0_2 limit can only be violated when the H_2 level exceeds 4 percent. Therefore, action 'a' only applies when H_2 exceeds 4 percent. This is how TVA interprets this requirement. The last phrase should be revised to read 'reduce the oxygen and/or hydrogen concentrations to the above limits within 48 hours.' We disagree with two portions of NRC's revision to action statement b. We think that the phrase 'and the hydrogen concentration greater than 2 percent by volume' should be reinserted. There is no explosive potential with H_2 less than 2 percent--NRC's revision is overly restrictive. We also think that the last phrase added by NRC should be revised to read 'and reduce the hydrogen and/or oxygen concentrations to the above limits within 48 hours. . .the limit.'

The basis for these requests can best be illustrated by the following figure.

The region bounded by the heavy line is the region that is acceptable according to the limiting condition for operation 3.11.2.5. The present wording (NRC version) of the action statements exclude part of the acceptable region (per LCO) from the region acceptable for complying with the action statements. This is inconsistent. Our proposal would eliminate this problem.



RADIOACTIVE EFFLUENTS

EXPLOSIVE GAS MIXTURE

LIMITING CONDITION FOR OPERATION

3.11.2.5 The concentration of oxygen in the waste gas holdup system shall be limited to less than or equal to 2% by volume whenever the hydrogen concentration exceeds 4% by volume.

APPLICABILITY: At all times.

ACTION:

a. With the concentration of oxygen in a waste gas holdup tank greater than 2% by volume but less than or equal to 4% by volume, reduce the hydrogen and/or oxygen concentrations to the above limits within 48 hours.

b. With the concentration of oxygen in a waste gas holdup tank greater than 4% by volume ~~and the hydrogen concentration greater than 2% by volume;~~ immediately suspend all additions of waste gases to the affected waste gas holdup tank and reduce the concentration of oxygen to less than or equal to 4% by volume within one hour, ~~and 2% by volume~~ and reduce the hydrogen and/or oxygen concentrations to the above limits within 48 hours after initially exceeding the limit.

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

Do not delete

SURVEILLANCE REQUIREMENTS

4.11.2.5 The concentration of hydrogen and oxygen in the waste gas holdup system shall be determined to be within the above limits by monitoring the waste gas additions to the waste gas holdup system with the hydrogen and oxygen monitors required OPERABLE by Table 3.3-13 of Specification 3.3.3.10.