SYNOPSIS OF REVISIONS INCLUDED IN WATTS BAR NUCLEAR PLANT UNIT 2 DEVELOPMENTAL REVISION H OF THE TECHNICAL SPECIFICATIONS AND TECHNICAL SPECIFICATION BASES

1.0 SUMMARY

This letter provides the Watts Bar Nuclear Plant (WBN) Unit 2 Developmental Revision H Technical Specifications (TS) and TS Bases. This is a complete copy of the entire TS and TS Bases.

The revisions include changes previously submitted by letter for WBN Unit 2 since the submittal of Developmental Revision G. Developmental Revision H also incorporates recently approved WBN Unit 1 amendments and amendments submitted and currently under review by the Nuclear Regulatory Commission (NRC). This revision adds Appendix B, "Environmental Protection Plan." Finally there are changes included that have been developed for WBN Unit 2 but have not submitted previously.

For the WBN Unit 2 revisions previously submitted (References 1 - 3, inclusive), a justification for these changes is not provided in this document as it was included in the referenced submittal. A discussion of the applicability of the WBN Unit 1 TS changes to WBN Unit 2 is provided in this enclosure. A technical basis for the WBN Unit 2 TS and TS Bases changes not previously submitted is provided in this enclosure. For all previously submitted and current changes, a summary of the changes is provided in Attachments 1 & 2.

2.0 CHANGES

2.1 WBN Unit 2 Changes Previously Submitted

- Submitted by Reference 1
  - TS 4.3.1 Criticality
  - TS Bases B3.7.15 Spent Fuel Assembly Storage

- Submitted by Reference 2
  - TS 3.4.16 Reactor Coolant System Specific Activity
  - TS Table 3.3.7-1 CREVS Actuation Instrumentation
  - TS 3.7.7 Component Cooling System (CCS)
  - TS 5.9.2 Annual Radiological Environmental Operating Report
  - TS Bases B.3.7.7 Component Cooling System (CCS)
  - TS Bases B.3.4.16 RCS Specific Activity

- Submitted by Reference 3
  - TS Table 3.3.3-1 Post Accident Monitoring Instrumentation
  - TS Bases B3.3.3 PAM Instrumentation

2.2 Approved WBN Unit 1 Amendments Applicable to WBN Unit 2

2.2.1 WBN Unit 1 Amendment 92 Associated with Alternate Source Term

WBN Unit 1 submitted an amendment request for the selective application of the Alternate Source Term (AST) for the Fuel Handling Accident (FHA). The WBN Unit 1 analysis that supported this application assumed no filtration or hold-up of the radioactive releases. This assumption resulted in the removal of operability requirements for certain safety-related filtration systems and normal ventilation system isolation functions during Mode 6 Operation (Refueling).

WBN Unit 2 submitted (Reference 4) revised Final Safety Analysis Report (FSAR) discussions, Technical Specifications (TS), and Technical Specification Bases (TSB) changes associated with the Design Basis Accident (DBA) discussion for the FHA that are based on the selective application of the AST. The WBN Unit 2 submittal was based on the WBN Unit 1 amendment request, and provided specific details of the WBN Unit 2 changes that were made to the FSAR, TS, and TSB.

The following provides a summary of the specific WBN Unit 2 TS, TS Bases, and Technical Requirements Manual changes that were made. Specific discussion is provided in Reference 4.

1. Add new WBN Unit 2 TS 3.9.10, "Decay Time" and associated TS Bases;
2. Modify WBN Unit 2 TS 3.3.6, "Containment Vent Isolation Instrumentation," TS 3.3.8, Auxiliary Building Gas Treatment System (ABGTS) Actuation Instrumentation," and TS 3.7.12, "Auxiliary Building Gas Treatment System (ABGTS)," in addition to the associated TS Bases;
3. Eliminate TS 3.9.4, "Containment Penetrations," and TS 3.9.8, "Reactor Building Purge Air Cleanup Units;"
4. Modify WBN Unit 2 TS 5.7.2.14, "Ventilation Filter Testing Program (VFTP):"
5. Modify WBN Unit 2 TS 5.7.2.20, "Control Room Envelope Habitability Program;"
6. Modify TS Bases B.3.6.1, "Containment Penetrations, B.3.6.2, "Containment Air Locks," and B.3.6.3, "Containment Isolation Valves," delete TS Bases B.3.9.4, and remove reference to TS 3.9.4 from TS Bases B.3.9;
7. Modify TS Bases B.3.7.13 "Spent Fuel Pool Level" and B.3.9.7 "Reactor Cavity Water Level" to update references associated with AST; and
8. Remove the decay time restriction on post shutdown irradiated fuel movement from Section 3.9.1 of the Technical Requirements Manual.

2.3 WBN Unit 1 Amendments Under NRC Review Applicable to WBN Unit 2

2.3.1 TS 3.8.4 DC Sources Operating

Reference 5 submitted a WBN Unit 1 amendment request related to the safety-related DC power system that was based on Technical Specification Task Force – 500 (TSTF-500). Because of plant specific design features at WBN, modifications to the standard TSTF template were required. The DC power system at WBN is shared by the two units and consequently, the TS for both units need to be the same.

The proposed adoption of TSTF-500, Revision 2, provides new TS Actions for an inoperable battery charger and alternate battery charger testing criteria. A longer Completion Time (CT) for an inoperable battery charger will allow additional time for maintenance and testing.

In addition, monitoring requirements for battery cell parameters and performance requirements for battery maintenance activities are proposed to be relocated from the TSs to a licensee controlled program. This focuses TS requirements on the analysis basis safety function of the battery.

The proposed TS changes are as follows:

- Revise 3.8.4, "DC Sources - Operating" to add Conditions for inoperable battery chargers and inoperable batteries, and relocate SRs on battery corrosion, connection resistance, and visual inspection, to the new Battery Monitoring and Maintenance Program. Allow use of the Modified Performance testing to satisfy SRs for Service Testing and Performance Testing.

- Revise the list of TS 3.8.4 SRs in TS 3.8.5, "DC Sources - Shutdown," that must be met to be consistent with the changes to TS 3.8.4.

- Rename TS LCO 3.8.6, "Battery Cell Parameters" to "Battery Parameters."

- Delete TS Table 3.8.6-1.

- Relocate TS 3.8.6 Conditions and SRs for battery cell parameters that do not meet Category A and B limits to the new Battery Monitoring and Maintenance Program. Retain Category C limits for cell float voltage and electrolyte level in new proposed TS. Relocate specific gravity limits to the new Battery Monitoring and Maintenance Program and replaced with float current monitoring to determine battery state of charge. Relocate SR for battery capacity test from TS 3.8.4 to TS 3.8.6.

- Add TS 5.7.2.21, "Battery Monitoring and Maintenance Program."

The proposed changes update the WBN Unit 2 to be consistent with TSTF-360 and TSTF-500, as the WBN Unit 2 design allows. While this amendment request does not use the NRC Model Safety Evaluation provided for TSTF-500 as the basis for this change, TVA reviewed Section 2.2 of the model application and has included all applicable information requested by the NRC in this section.

2.4 WBN Unit 2 TS or TSB Changes Not Previously Submitted to the NRC

2.4.1 Technical Specification Bases 3.6.8 HMS

Consistent with 10 CFR 50.44, Unit 2 abandoned the hydrogen recombiners in place. Unit 2 Developmental Technical Specifications and Bases were previously revised to delete TS 3.6.7 and TS Bases 3.6.7 concerning the hydrogen recombiners. A sentence in TS Bases 3.6.8 that credits the hydrogen recombiners for maintaining the hydrogen concentration resulting from a DBA less than the hydrogen flammability limit also should have been deleted. This proposed change corrects the over-sight in TS Bases 3.6.8.

2.4.2 Technical Specification SR 3.6.13.4 Divider Barrier Integrity

This section has been removed from the WBN Unit 2 TS. This section describes a test used on WBN Unit 1 to check cold bond repairs to the divider barrier. There are no cold bond repairs on WBN Unit 2. The associated TS Bases has also been removed.

2.4.3 Appendix B, Environmental Protection Plan

An Environmental Protection Plan (EPP) has been added as Appendix B to the Facility Operating License. The EPP is modeled on the WBN Unit 1 and Sequoyah Nuclear Plant EPPs. Recent EPP amendments from other nuclear plants were also reviewed. Reporting and monitoring programs were incorporated as outlined below.

Aquatic Ecological Monitoring

Consistent with current standards, Aquatic Ecological Monitoring is contained in the effective National Pollution Discharge Elimination System permit for the WBN site. Separate redundant reporting to the NRC is not required (References 6 & 7).

Terrestrial Ecological Monitoring

The U.S Fish and Wildlife Service's Biological Opinion concluded that WBN plant operation would not likely jeopardize the continued existence of the species (Reference 6).

The Effects of Cooling Tower Drift and Bird Collisions with Cooling Towers monitoring programs have been completed and no further monitoring under these programs is planned or required.

WBN Unit 1 provides annual reports to the NRC on transmission line maintenance activities. This requirement is not carried over to the WBN Unit 2 EPP as it is redundant to reporting TVA makes to the states and the US Environmental Protection Agency for the transmission system including the specific transmission lines addressed by WBN Unit 1.

TVA does not conduct or propose to conduct any other monitoring activities specific to the WBN site and WBN dual-unit operation.

References

1. TVA Letter to NRC dated September 26, 2013, "Watts Bar Nuclear Plant (WBN) Unit 2 – Submittal of Revised Section 4.3.1, "Criticality" Developmental Revision G of the Unit 2 Technical Specification (TS)"

2. TVA Letter to NRC dated June 13, 2013, "Watts Bar Nuclear Plant (WBN) Unit 2 – Submittal of Three Revised Specifications from Developmental Revision G of the Unit 2 Technical Specifications (TS)"

3. TVA Letter to NRC dated August 27, 2012, "Watts Bar Nuclear Plant (WBN) Unit 2 – Update to Technical Specification (TS) Table 3.3.3-1 and Technical Specification Bases (TSBs) 3.3.3"

4. TVA letter to NRC dated December 12, 2013, "Watts Bar Nuclear Plant Unit 2 - Fuel Handling Accident Dose Analysis Final Safety Analysis Report and Specification Revision"

5. TVA letter to NRC dated August 28, 2013, "Application to Modify Watts Bar Nuclear Plant, Unit 1 Technical Specifications (TS) 3.8.4, 3.8.5, and 3.8.6 (WBN-TS-12-07)" (ADAMS Accession No. ML 13248A250)

6. Final Environmental Statement Related to Operation of Watts Bar Nuclear Plant Unit No. 2, Nuclear Regulatory Commission, May 2013, Docket Nos. 50-390 and 50-391, NUREG-0498, Final Report, Supplement No. 2, Vols. 1 & 2, ADAMS Accession Nos. ML13144A092 & ML13144A093, respectively

7. Appendix B to Facility Operating License NPF-90, Watts Bar Nuclear Plant Unit 1, Environmental Protection Plan

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT, UNIT 2

Revisions to Developmental Technical Specification (TS) and Technical Specification Bases (TSB) Revision H

ATTACHMENTS

1. TS Changes (Mark-Up) for WBN Unit 2
2. TS Bases Changes (Mark-Up) for WBN Unit 2
3. WBN Unit 2 TS and TSB Developmental Revision H (Optical Media Storage)

ATTACHMENT 1

Technical Specification Changes (Mark-Up) for WBN Unit 2

Table 3.3.3-1 (page 1 of 3)
Post Accident Monitoring Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS / TRAINS	CONDITION REFERENCED FROM REQUIRED ACTION D.1
1)	Intermediate Range Neutron Flux [g]	1[a], 2[b], 3	2	E
2)	Source Range Neutron Flux	2[c], 3	2	E
3)	Reactor Coolant System (RCS) Hot Leg Temperature (T-Hot)	1, 2, 3	1 per loop	E
4)	RCS Cold Leg Temperature (T-Cold)	1, 2, 3	1 per loop	E
5)	RCS Pressure (Wide Range)	1, 2, 3	3	E
6)	Reactor Vessel Water Level [f] ~~[g]~~	1, 2, 3	2	F
7)	Containment Sump Water Level (Wide Range)	1, 2, 3	2	E
8)	Containment Lower Comp. Atm. Temperature	1, 2, 3	2	E
9)	Containment Pressure (Wide Range) [g]	1, 2, 3	2	E
10)	Containment Pressure (Narrow Range)	1, 2, 3	4	E
11)	Containment Isolation Valve Position [g]	1, 2, 3	2 per penetration flow path [d][i]	E
12)	Containment Radiation (High Range)	1, 2, 3	2 upper containment 2 lower containment	F
13)	RCS Pressurizer Level	1, 2, 3	3	E
14)	Steam Generator (SG) Water Level (Wide Range) [g]	1, 2, 3	1/SG	E

(continued)

3.3 INSTRUMENTATION

3.3.6 Containment Vent Isolation Instrumentation

LCO 3.3.6 The Containment Vent Isolation instrumentation for each Function in Table 3.3.6-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.~~,~~
~~During movement of irradiated fuel assemblies within containment.~~

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One radiation monitoring channel inoperable.	A.1 Restore the affected channel to OPERABLE status.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ~~----------NOTE----------~~ ~~Only applicable in MODE 1, 2, 3, or 4.~~ ~~----------~~ One or more Functions with one or more manual or automatic actuation trains inoperable. OR Two radiation monitoring channels inoperable. OR Required Action and associated Completion Time of Condition A not met.	----------NOTE---------- One train of automatic actuation logic may be bypassed and Required Action B.1 may be delayed for up to 4 hours for Surveillance testing provided the other train is OPERABLE. ---------- B.1 Enter applicable Conditions and Required Actions of LCO 3.6.3, "Containment Isolation Valves," for containment purge and exhaust isolation valves made inoperable by isolation instrumentation.	Immediately

~~(continued)~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. ----------NOTE---------- Only applicable during movement of irradiated fuel assemblies within containment. ---------- One or more Functions with one or more manual or automatic actuation trains inoperable. OR Two radiation monitoring channels inoperable. OR Required Action and associated Completion Time for Condition A not met.	C.1 Place and maintain containment purge and exhaust valves in closed position. OR C.2 Enter applicable Conditions and Required Actions of LCO 3.9.4, "Containment Penetrations," for containment purge and exhaust isolation valves made inoperable by isolation instrumentation.	Immediately Immediately

Table 3.3.6-1 (page 1 of 1)
Containment Vent Isolation Instrumentation

FUNCTION	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Manual Initiation	2	SR 3.3.6.6	NA
2. Automatic Actuation Logic and Actuation Relays	2 trains	SR 3.3.6.2 SR 3.3.6.3 SR 3.3.6.5	NA
3. Containment Purge Exhaust Radiation Monitors	2	SR 3.3.6.1 SR 3.3.6.4 SR 3.3.6.7	~~≤ 8.41E-02 µCi/cc[(a)] (3.43x10^4 cpm)~~ ≤ 2.8E-02 µCi/cc[(b)] (1.14x10^4 cpm)
4. Safety Injection	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 1, for all initiation functions and requirements.		

~~(a) During movement of irradiated fuel assemblies within containment.~~

~~(b) Modes 1, 2, 3, and 4.~~

Table 3.3.7-1 (page 1 of 1)
CREVS Actuation Instrumentation

	FUNCTION	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1.	Manual Initiation	2 trains	SR 3.3.7.3	NA
2.	Control Room Radiation Control Room Air Intakes	2	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.4	≤ **1.647E-04**~~9.45E-05~~ μC/cc (3,308 cpm)
3.	Safety Injection	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 1, for all initiation functions and requirements.		

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2	Place both trains in emergency radiation protection mode.	Immediately
~~C. Required Action and associated Completion Time for Condition A or B not met during movement of irradiated fuel assemblies in the fuel handling area.~~	~~C.1~~	~~Suspend movement of irradiated fuel assemblies in the fuel handling area.~~	~~Immediately~~
~~D.~~**C.** Required Action and associated Completion Time for Condition A or B not met ~~in MODE 1, 2, 3, or 4~~.	~~D~~**C**.1 AND ~~D~~**C**.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

~~NOTE~~

~~Refer to Table 3.3.8-1 to determine which SRs apply for each ABGTS Actuation Function.~~

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.3.8.1~~	~~Perform CHANNEL CHECK.~~	~~12 hours~~
~~SR 3.3.8.2~~	~~Perform COT.~~	~~92 days~~

~~(continued)~~

SURVEILLANCE REQUIREMENTS ~~(continued)~~

	SURVEILLANCE	FREQUENCY
SR 3.3.8.~~3~~1	----------NOTE---------- Verification of setpoint is not required. ---------- Perform TADOT.	18 months
~~SR 3.3.8.4~~	~~Perform CHANNEL CALIBRATION.~~	~~18 months~~

Table 3.3.8-1 (page 1 of 1)
ABGTS Actuation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Manual Initiation	1,2,3,4 ~~(a)~~	2 ~~2~~	SR 3.3.8.~~3~~1 ~~SR 3.3.8.3~~	NA ~~NA~~
~~2. Fuel Pool Area Radiation Monitors~~	~~(a)~~	~~2~~	~~SR 3.3.8.1~~ ~~SR 3.3.8.2~~ ~~SR 3.3.8.4~~	~~≤ 1161 mR/hr~~
~~3.~~2. Containment Isolation	Refer to LCO 3.3.2, Function 3.a., for all Phase A initiating functions and requirements.			

(a) ~~During movement of irradiated fuel assemblies in the fuel handling area.~~

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.16 RCS Specific Activity

LCO 3.4.16 The specific activity of the reactor coolant shall be within limits.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS average temperature (T_{avg}) ≥ 500°F.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. DOSE EQUIVALENT I-131 > 0.265 μCi/gm.	----------NOTE---------- LCO 3.0.4.c is applicable. ----------		
	A.1	Verify DOSE EQUIVALENT I-131 ≤ ~~21~~ **14** μCi/gm.	Once per 4 hours
	AND		
	A.2	Restore DOSE EQUIVALENT I-131 to within limit.	48 hours
B. Gross specific activity of the reactor coolant not within limit.	B.1	Perform SR 3.4.16.2.	4 hours
	AND		
	B.2	Be in MODE 3 with T_{avg} < 500°F.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A not met. OR DOSE EQUIVALENT I-131 > ~~21~~ **14** μCi/gm.	C.1 Be in MODE 3 with T_{avg} < 500°F.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	Verify reactor coolant gross specific activity ≤ 100/ $\bar{E}$ μCi/gm.	7 days
SR 3.4.16.2	----------NOTE---------- Only required to be performed in MODE 1. ---------- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 0.265 μCi/gm.	14 days AND Between 2 hours and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period

(continued)

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.13.1	Verify, by visual inspection, all personnel access doors and equipment hatches between upper and lower containment compartments are closed.	Prior to entering MODE 4 from MODE 5
SR 3.6.13.2	Verify, by visual inspection, that the seals and sealing surfaces of each personnel access door and equipment hatch have: a. No detrimental misalignments; b. No cracks or defects in the sealing surfaces; and c. No apparent deterioration of the seal material.	Prior to final closure after each opening AND ----------NOTE--------- Only required for seals made of resilient materials ---------- 10 years
SR 3.6.13.4	**Not used.**~~Verify, by peel test on three specimens for each replacement seal repair location, that the length of peel for at least two of the test specimens is less than or equal to 1 inch.~~	~~Prior to initial fuel loading for joints made prior to fuel loading~~ ~~AND~~ ~~(continued)~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
~~SR 3.6.13.4~~	~~(continued)~~	~~18 months for the first two refueling outages after fabrication of any joint~~ ~~AND~~ ~~18 months thereafter for a fabricated splice joint, if any of the three test specimens peel length is > ½ inch~~ ~~OR~~ ~~36 months thereafter for a fabricated splice joint, if all three associated test specimens peel length is ≤ ½ inch~~
SR 3.6.13.5	Visually inspect ≥ 95% of the divider barrier seal length, and verify: a. Seal and seal mounting bolts are properly installed; and b. Seal material shows no evidence of deterioration due to holes, ruptures, chemical attack, abrasion, radiation damage, or changes in physical appearance.	18 months

3.7 PLANT SYSTEMS

3.7.7 Component Cooling System (CCS)

----------NOTE----------
CCS Pump 1B-B aligned to CCS Train B supports an OPERABLE CCS Train B for Unit 2 only when CCS Pump 1B-B is OPERABLE and operating as verified by SR 3.7.7.5.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CCS train inoperable.	A.1	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops-MODE 4," for residual heat removal loops made inoperable by CCS. ---------- Restore CCS train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 AND B.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.7.1	Verify that the alternate feeder breaker to the C-S pump is open.	7 days
SR 3.7.7.2	----------NOTE---------- Isolation of CCS flow to individual components does not render the CCS inoperable. ---------- Verify each CCS manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.7.3	Verify each CCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	18 months
SR 3.7.7.4	Verify each CCS pump starts automatically on an actual or simulated actuation signal. **When CCS Pump 1B-B is substituted for CCS Pump C-S to establish CCS Train B operability, SR 3.7.7.4 does not apply to CCS Pump 1B-B (See SR 3.7.7.5).**	18 months
SR 3.7.7.5	**When CCS Pump 1B-B is substituted for CCS Pump C-S for Unit 2 CCS Train B operability, then,** **Verify CCS 1B-B is aligned to CCS Train B and is operating.**	**12 hours**

3.7 PLANT SYSTEMS

3.7.12 Auxiliary Building Gas Treatment System (ABGTS)

LCO 3.7.12 Two ABGTS trains shall be OPERABLE

APPLICABILITY: MODES 1, 2, 3, and 4.~~,~~
~~During movement of irradiated fuel assemblies in the fuel handling area.~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ABGTS train inoperable	A.1 Restore ABGTS train to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met ~~in MODE 1, 2, 3, or 4~~. OR Two ABGTS trains inoperable ~~in MODE 1, 2, 3, or 4~~.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours
~~C. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the fuel handling area.~~	~~C.1 Place OPERABLE ABGTS train in operation.~~ ~~OR~~ ~~C.2 Suspend movement of irradiated fuel assemblies in the fuel handling area~~	~~Immediately~~ ~~Immediately~~
~~D. Two ABGTS trains inoperable during movement of irradiated fuel assemblies in the fuel handling area.~~	~~D.1 Suspend movement of irradiated fuel assemblies in the fuel handling area.~~	~~Immediately~~

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

LCO 3.8.4 Four channels of vital DC and four Diesel Generator (DG) DC electrical power subsystems shall be OPERABLE.

----------NOTES----------

1. Vital Battery V may be substituted for any of the required vital batteries.
2. **Spare Vital Chargers 6-S, 7-S, 8-S, or 9-S may be substituted for required Vital chargers.**
3. **Spare DG Chargers 1A1, 1B1, 2A1, or 2B1 may be substituted for required DG chargers.**

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required vital battery charger inoperable.	**A.1**	**Restore vital battery terminal voltage to greater than or equal to the minimum established float voltage.**	**2 hours**
	AND		
	A.2	**Verify vital battery charger float current ≤ 2 amps.**	**Once per 12 hours**
	AND		
	A.3	**Restore vital battery charger to OPERABLE status.**	**72 hours**

B. One required vital battery inoperable.	**B.1**	**Restore vital battery to OPERABLE status.**	**2 hours**
~~A.~~**C.** One **required** vital DC ~~electrical power subsystem~~ **channel** inoperable **for reasons other than Condition A or B.**.	~~A~~**C**.1	Restore vital DC ~~electrical power subsystem~~ **channel** to OPERABLE status	2 hours
~~B.~~**D.** Required Action and Associated Completion Time of Condition A, **B, or C** not met.	~~B~~**D**.1 AND ~~B~~**D**.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours
E. One required DG battery charger inoperable.	**E.1** **AND** **E.2** **AND** **E.3**	**Restore DG battery terminal voltage to greater than or equal to the minimum established float voltage.** **Verify DG battery charger float current ≤ 2 amps.** **Restore DG battery charger to OPERABLE status.**	**2 hours** **Once per 12 hours** **72 hours**
F. One required DG battery inoperable.	**F.1**	**Restore DG battery to OPERABLE status.**	**2 hours**
~~C.~~**G.** One **required** DG DC electrical power subsystem inoperable **for reasons other than Condition E or F.**	~~C~~**G**.1	Restore DG DC electrical power subsystem to OPERABLE status	2 hours

~~D.~~**H.** Required Action and associated Completion Time of Condition ~~C~~**E, F, or G** not met	~~D~~**H**.1 Declare associated DG inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.4.1	Verify vital battery terminal voltage is ~~≥ 128 V (132 V for vital battery V) on float charge~~ **greater than or equal to the minimum established float voltage**.	7 days
SR 3.8.4.2	Verify DG battery terminal voltage is ~~≥ 124 V on float charge~~ **greater than or equal to the minimum established float voltage**.	7 days
SR 3.8.4.3	Verify for the vital batteries that the alternate feeder breakers to each required battery charger are open.	7 days
SR 3.8.4.4	Verify correct breaker alignment and indicated power availability for each DG 125 V DC distribution panel and associated battery charger	7 days
~~SR 3.8.4.5~~	~~Verify no visible corrosion at terminals and connectors for the vital batteries.~~ ~~OR~~ ~~Verify connection resistance for the vital batteries is ≤ 80 E-6 ohm for inter-cell connections, ≤ 50 E-6 ohm for inter-rack connections, ≤ 120 E-6 ohm for inter-tier connections, and ≤ 50 E-6 ohm for terminal connections.~~	~~92 days~~
~~SR 3.8.4.6~~	~~Verify no visible corrosion at terminals and connectors for the DG batteries.~~ ~~OR~~ ~~Verify connection resistance for the DG batteries is ≤ 80 E-6 ohm for inter-cell connections, ≤ 50 E-6 ohm for inter-tier connections, and ≤ 50 E-6 ohm for terminal connections.~~	~~92 days~~

~~SR 3.8.4.7~~	~~Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration.~~	~~12 months~~

~~(continued)~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
~~SR 3.8.4.8~~	~~Remove visible terminal corrosion and verify battery cell to cell and terminal connections are coated with anti-corrosion material.~~	~~12 months~~
~~SR 3.8.4.9~~	~~Verify connection resistance for the vital batteries is ≤ 80 E-6 ohm for inter-cell connections, ≤ 50 E-6 ohm for inter-rack connections, ≤ 120 E-6 ohm for inter-tier connections, and ≤ 50 E-6 ohm for terminal connections.~~	~~12 months~~
~~SR 3.8.4.10~~	~~Verify connection resistance for the DG batteries is ≤ 80 E-6 ohm for inter-cell connections, ≤ 50 E-6 ohm for inter-tier connections, and ≤ 50 E-6 ohm for terminal connections.~~	~~12 months~~
SR 3.8.4.~~11~~**5**	~~NOTE~~ ~~This Surveillance is normally not performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR.~~ Verify each vital battery charger ~~is capable of recharging its associated battery from a service or capacity discharge test while supplying normal loads.~~ **supplies ≥ 200 amps at greater than or equal to the minimum established float voltage for ≥ 4 hours.** OR Verify each vital battery charger ~~is capable of operating for ≥ 4 hours at current limit 220 amps – 250 amps.~~ **can recharge the battery to the fully charged state within 24 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.**	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.4.~~12~~6 ~~----------NOTE----------~~ ~~Credit may be taken for unplanned events that satisfy this SR.~~ ~~----------~~ Verify each ~~diesel generator~~**DG** battery charger ~~is capable of recharging its associated battery from a service or capacity discharge test while supplying normal loads.~~ **supplies ≥ 200 amps at greater than or equal to the minimum established float voltage for ≥ 4 hours.** **OR** **Verify each DG battery charger can recharge the battery to the fully charged state within 24 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.**	18 months
SR 3.8.4.~~13~~7 ----------NOTES---------- 1. The modified performance discharge test in SR 3.8.4.~~14~~6 may be performed in lieu of the service test in SR 3.8.4.~~13~~ 7 once per 60 months. 2. ~~This Surveillance is not performed in MODE 1, 2, 3, or 4 for required vital batteries.~~ Credit may be taken for unplanned events that satisfy this SR. ---------- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads and any connected nonsafety loads for the design duty cycle when subjected to a battery service test.	18 months

~~(continued)~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.14	NOTE This Surveillance is not performed in MODE 1, 2, 3, or 4 for required vital batteries. Credit may be taken for unplanned events that satisfy this SR. Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	60 months AND 12 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources - Shutdown

LCO 3.8.5 Vital DC and Diesel Generator (DG) DC electrical power subsystems shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown" and to support the Diesel Generators (DGs) required by LCO 3.8.2, "AC Sources - Shutdown."

----------NOTES----------

1. Vital Battery V may be substituted for any of the required vital batteries.
2. **Spare vital chargers 6-S, 7-S, 8-S, or 9-S may be substituted for required vital chargers.**
3. **Spare DG chargers 1A1, 1B1, 2A1, or 2B1 may be substituted for required DG chargers.**

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more required vital DC electrical power subsystems inoperable.	A.1.1	Declare affected required feature(s) inoperable.	Immediately
	OR		
	A.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
	AND		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2.3	Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND		
	A.2.4	Initiate action to restore required **vital** DC electrical power subsystems to OPERABLE status.	Immediately
B. One **or more** required DG DC electrical power subsystem**s** inoperable.	B.1	Declare associated DG inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	----------NOTE---------- The following SRs are not required to be performed: SR 3.8.4.~~11~~**5**, SR 3.8.4.~~12~~**6**, ~~SR 3.8.4.13,~~ and SR 3.8.4.~~14~~**7**. ----------	
	For DC sources required to be OPERABLE, the following SRs are applicable:	In accordance with applicable SRs

SR 3.8.4.1	SR 3.8.4.6	~~SR 3.8.4.11~~
SR 3.8.4.2	SR 3.8.4.7	~~SR 3.8.4.12~~
SR 3.8.4.3	~~SR 3.8.4.8~~	~~SR 3.8.4.13~~
SR 3.8.4.4	~~SR 3.8.4.9~~	~~SR 3.8.4.14~~
SR 3.8.4.5	~~SR 3.8.4.10~~	

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery ~~Cell~~ Parameters

LCO 3.8.6 Battery ~~cell~~ parameters for 125 V vital batteries and 125 V diesel generator (DG) batteries shall be within the limits ~~of Table 3.8.6-1~~.

APPLICABILITY: When associated DC electrical power subsystems and DGs are required to be OPERABLE.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each battery ~~bank~~.

~~CONDITION~~	~~REQUIRED ACTION~~		~~COMPLETION TIME~~
A. ~~One or more batteries with one or more battery cell parameters not within Category A or B limits.~~	~~A.1~~	~~Verify pilot cells electrolyte level and float voltage meet Table 3.8.6-1 Category C limits.~~	~~1 hour~~
	~~AND~~		
	~~A.2~~	~~Verify battery cell parameters meet Table 3.8.6-1 Category C limits.~~	~~24 hours~~ ~~AND~~ ~~Once per 7 days thereafter~~
	~~AND~~		
	~~A.3~~	~~Restore battery cell parameters to Category A and B limits of Table 3.8.6-1.~~	~~31 days~~

(continued)

~~ACTIONS (continued)~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~B. Required Action and associated Completion Time of Condition A not met.~~ ~~OR~~ ~~One or more batteries with average electrolyte temperature of the representative cells < 60°F for vital batteries and < 50°F for DG batteries.~~ ~~OR~~ ~~One or more batteries with one or more battery cell parameters not within Category C values.~~	~~B.1 Declare associated battery inoperable.~~	~~Immediately~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required vital battery with one or more battery cells float voltage < 2.07 V.	**A.1 Perform SR 3.8.4.1.** **AND** **A.2 Perform SR 3.8.6.1.** **AND** **A.3 Restore affected cell float voltage ≥ 2.07 V.**	**2 hours** **2 hours** **24 hours**
B. One required vital battery with float current	**B.1 Perform SR 3.8.4.1.** **AND**	**2 hours**

> 2 amps.	B.2	Restore vital battery float current to < 2 amps.	12 hours
C. One required DG battery with one or more battery cells float voltage < 2.07 V.	C.1	Perform SR 3.8.4.2.	2 hours
	AND		
	C.2	Perform SR 3.8.6.2.	2 hours
	AND		
	C.3	Restore affected cell float voltage ≥ 2.07 V.	24 hours
D. One required DG battery with float current > 1 amp.	D.1	Perform SR 3.8.4.2.	2 hours
	AND		
	D.2	Restore DG battery float current to < 2 amps.	12 hours
----------NOTE---------- Required Action E.2 shall be completed if electrolyte level was below the top of plates. ----------	----------NOTE---------- Required Actions E.1 and E.2 are only applicable if electrolyte level was below the top of plates. ----------		
E. One required battery with one or more cells with electrolyte level less than minimum established design limits.	E.1	Restore electrolyte levels to above top of plates.	8 hours
	AND		
	E.2	Verify no evidence of leakage.	12 hours
	AND		
	E.3	Restore electrolyte level to greater than or equal to minimum established design limits.	31 days

F. One required battery with pilot cell electrolyte temperature less than minimum established design limits.	F.1	Restore battery pilot cell temperature to greater than or equal to minimum established design limits.	12 hours
G. More than one required vital batteries with battery parameters not within limits. OR More than one required DG batteries with battery parameters not within limits.	G.1	Restore battery parameters to within limits.	2 hours
H. Required Action and associated Completion Time of Condition A, B, C, D, E, F, or G not met. OR One required vital battery with one or more battery cells float voltage < 2.07 V and float current > 2 amps. OR One required DG battery with one or more battery cells float voltage < 2.07 V and float current > 2 amps.	H.1	Declare associate battery inoperable	Immediately

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~	~~FREQUENCY~~

~~SR 3.8.6.1~~	~~Verify battery cell parameters meet Table 3.8.6-1 Category A limits.~~	~~7 days~~

~~(continued)~~

~~SURVEILLANCE REQUIREMENTS (continued)~~

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.8.6.2~~	~~Verify battery cell parameters meet Table 3.8.6-1 Category B limits.~~	~~92 days~~ ~~AND~~ ~~Once within 24 hours after a battery discharge < 110 V for vital batteries (113.5 V for vital battery V) or 106.5 V for DG batteries~~ ~~AND~~ ~~Once within 24 hours after a battery overcharge > 150 V for vital batteries (155 V for vital battery V) or 145 V for DG batteries~~
~~SR 3.8.6.3~~	~~Verify average electrolyte temperature of representative cells is ≥ 60°F for vital batteries and ≥ 50°F for the DG batteries.~~	~~92 days~~

~~Table 3.8.6-1 (page 1 of 1)~~
~~Battery Cell Parameters Requirements~~

~~PARAMETER~~	~~CATEGORY A: LIMITS FOR EACH DESIGNATED PILOT CELL~~	~~CATEGORY B: LIMITS FOR EACH CONNECTED CELL~~	~~CATEGORY C: ALLOWABLE LIMIT FOR EACH CONNECTED CELL~~
~~Electrolyte Level~~	~~> Minimum level indication mark, and ≤ 1/4 inch above maximum level indication mark (a)~~	~~> Minimum level indication mark, and ≤ 1/4 inch above maximum level indication mark (a)~~	~~Above top of plates, and not overflowing~~
~~Float Voltage~~	~~≥ 2.13 V~~	~~≥ 2.13 V~~	~~> 2.07 V~~
~~Specific Gravity (b)(c)~~	~~≥ 1.200~~	~~≥ 1.195 AND Average of all connected cells > 1.205~~	~~Not more than 0.020 below average of all connected cells AND Average of all connected cells ≥ 1.195~~

~~(a) It is acceptable for the electrolyte level to temporarily increase above the specified maximum level during equalizing charges provided it is not overflowing.~~
~~(b) Corrected for electrolyte temperature and level. Level correction is not required, however, when battery charging is < 2 amps when on float charge for vital batteries and < 1.0 amp for DG batteries.~~
~~(c) A battery charging current of < 2 amps when on float charge for vital batteries and < 1.0 amp for DG batteries is acceptable for meeting specific gravity limits following a battery recharge, for a maximum of 31 days. When charging current is used to satisfy specific gravity requirements, specific gravity of each connected cell shall be measured prior to expiration of the 31 day allowance.~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.6.1	----------NOTE---------- Not required to be met when vital battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. ---------- Verify each vital battery float current is < 2 amps.	7 days

SR 3.8.6.2	----------NOTE---------- Not required to be met when DG battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.2. ---------- Verify each DG battery float current is < 1 amp.	7 days
SR 3.8.6.3	Verify each required vital and DG battery pilot cell float voltage is ≥ 2.07 V.	31 days
SR 3.8.6.4	Verify each required vital and DG battery connected cell electrolyte level is greater than or equal to minimum established design limits.	31 days
SR 3.8.6.5	Verify each required vital and DG battery pilot cell temperature is greater than or equal to minimum established design limits.	31 days
SR 3.8.6.6	Verify each required vital and DG battery connected cell float voltage is ≥ 2.07 V.	92 days

SR 3.8.6.7	**----------NOTE----------** **Credit may be taken for unplanned events that satisfy this SR.** **----------** **Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.**	**60 months** **AND** **12 months when battery shows degradation, or has reached 85% of the expected life with capacity < 100% of manufacturer's rating** **AND** **24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating**

3.9 REFUELING OPERATIONS

3.9.4 **THIS SECTION NOT USED**~~Containment Penetrations~~

~~LCO 3.9.4~~ ~~The containment penetrations shall be in the following status:~~

~~a. The equipment hatch closed and held in place by a minimum of four bolts;~~

~~b. One door in each air lock closed; or capable of being closed provided ABGTS is OPERABLE in accordance with TS 3.7.12; and~~

~~c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:~~

~~1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or~~

~~2. capable of being closed by an OPERABLE Containment Vent Isolation System.~~

~~NOTE~~

~~Penetration flow path(s) providing direct access from the containment atmosphere to the outside atmosphere may be unisolated under administrative controls provided ABGTS is OPERABLE in accordance with TS 3.7.12.~~

~~APPLICABILITY:~~ ~~During movement of irradiated fuel assemblies within containment.~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. One or more containment penetrations not in required status.~~	~~A.1 Suspend movement of irradiated fuel assemblies within containment.~~	~~Immediately~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.9.4.1~~	~~Verify each required containment penetration is in the required status.~~	~~7 days~~
~~SR 3.9.4.2~~	~~Verify each required containment vent isolation valve actuates to the isolation position on an actual or simulated actuation signal.~~	~~18 months~~

3.9 REFUELING OPERATIONS

3.9.8 ~~Reactor Building Purge Air Cleanup Units~~**THIS SECTION NOT USED**

~~LCO 3.9.8~~ ~~Two Reactor Building Purge Air Cleanup Units shall be OPERABLE.~~

~~APPLICABILITY:~~ ~~During movement of irradiated fuel assemblies within the containment.~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
A. ~~One Reactor Building Purge Air Cleanup Unit inoperable.~~	~~A.1~~ ~~Isolate the inoperable air cleanup unit.~~	~~Immediately~~
	~~AND~~	
	~~A.2~~ ~~Verify the OPERABLE air cleanup unit is in operation.~~	~~Immediately~~
B. ~~Two Reactor Building Purge Air Cleanup Units inoperable.~~	~~B.1~~ ~~Suspend movement of irradiated fuel assemblies within containment.~~	~~Immediately~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.9.8.1~~	~~Perform required filter testing in accordance with the Ventilation Filter Testing Program (VFTP).~~	~~In accordance with the VFTP~~

3.9 REFUELING OPERATIONS

3.9.10 Decay Time

LCO 3.9.10 The reactor shall be subcritical for ≥ 100 hours.

APPLICABILITY: During movement of irradiated fuel assemblies within the containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Reactor subcritical for < 100 hours.	A.1 Suspend all operations involving movement of irradiated fuel assemblies within the containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.10.1	Verify the reactor has been subcritical for ≥ 100 hours by confirming the date and time of subcriticality.	Prior to movement of irradiated fuel in the reactor vessel.

4.0 DESIGN FEATURES (continued)

4.3 Fuel Storage

4.3.1 Criticality

4.3.1.1 The spent fuel storage racks (shown in Figure 4.3-1) are designed and shall be maintained with:

a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent **(wt%)**;

b. $k_{eff} \leq 0.95$ if fully flooded with unborated water, which, includes an allowance for uncertainties as described in Sections 4.3.2.7 and 9.1 of the FSAR;

c. Distances between fuel assemblies are a nominal 10.375 inch center-to-center spacing in the twenty-four flux trap rack modules.

d. Fuel assemblies with initial enrichments less than a maximum of 5 **wt% U-235** ~~percent~~ enrichment (nominally 4.95 ± 0.05 **wt% U-235**~~percent~~) may be stored in the spent fuel racks in **any** one of four arrangements with specific limits as identified below:

1. ~~New and spent f~~**F**uel assemblies may be stored in the racks in an all cell arrangement provided the burnup of each assembly is in the acceptable domain identified in Figure 4.3-3, depending upon the specified initial enrichment.

2. New and spent fuel assemblies may be stored in a checkerboard arrangement of 2 new and 2 spent assemblies, provided that each spent fuel assembly has accumulated a minimum burnup in the acceptable domain identified in Figure 4.3-4.

3. New fuel assemblies may be stored in 4-cell arrays with 1 of the 4 cells remaining empty of fuel (i.e. containing only water or water with up to 75 percent by volume of non-fuel bearing material.

(continued)

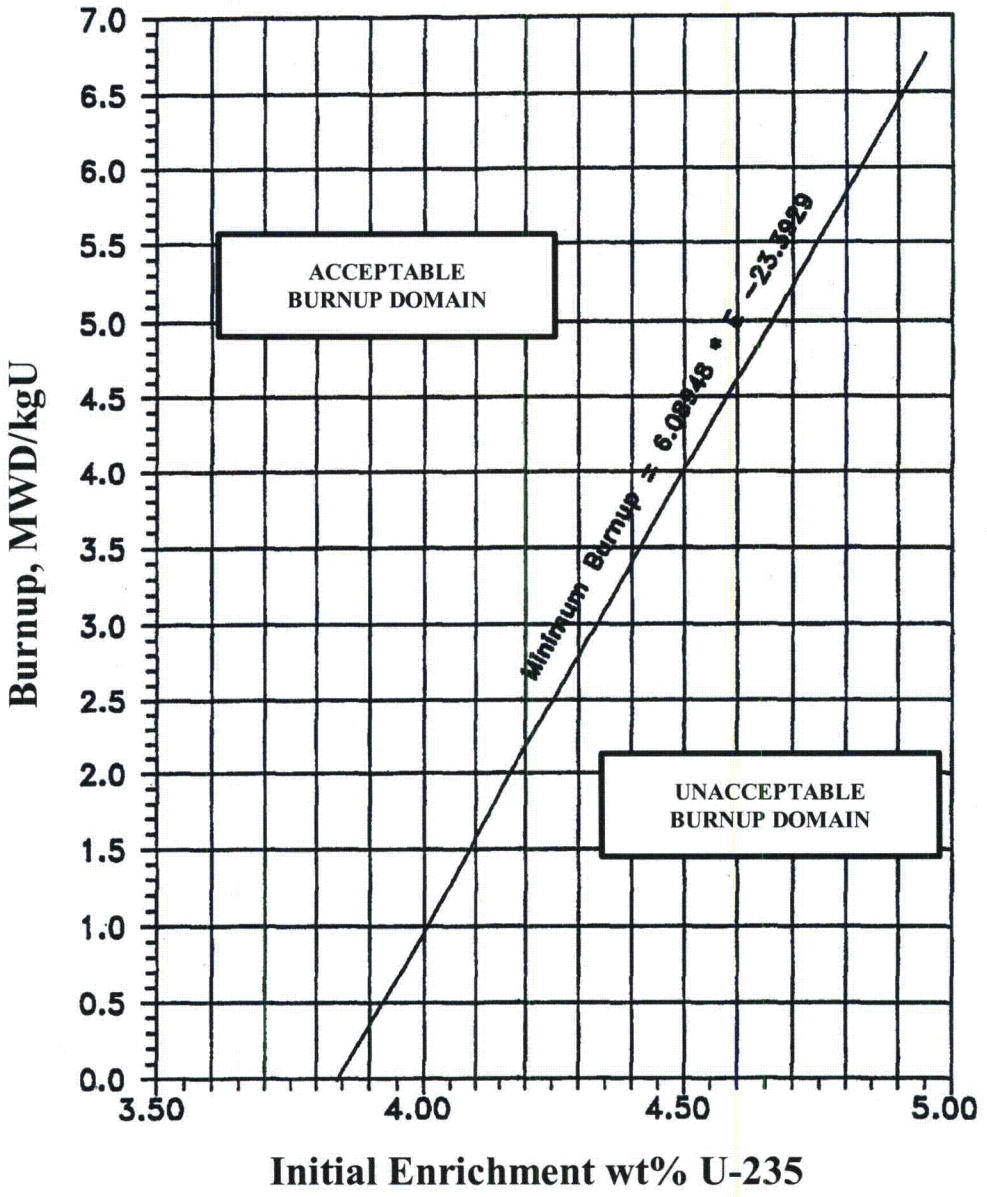

FIGURE 4.3-3
MINIMUM REQUIRED BURNUP FOR UNRESTRICTED STORAGE
OF ~~NEW AND SPENT~~ FUEL OF VARIOUS INITIAL ENRICHMENTS

(continued)

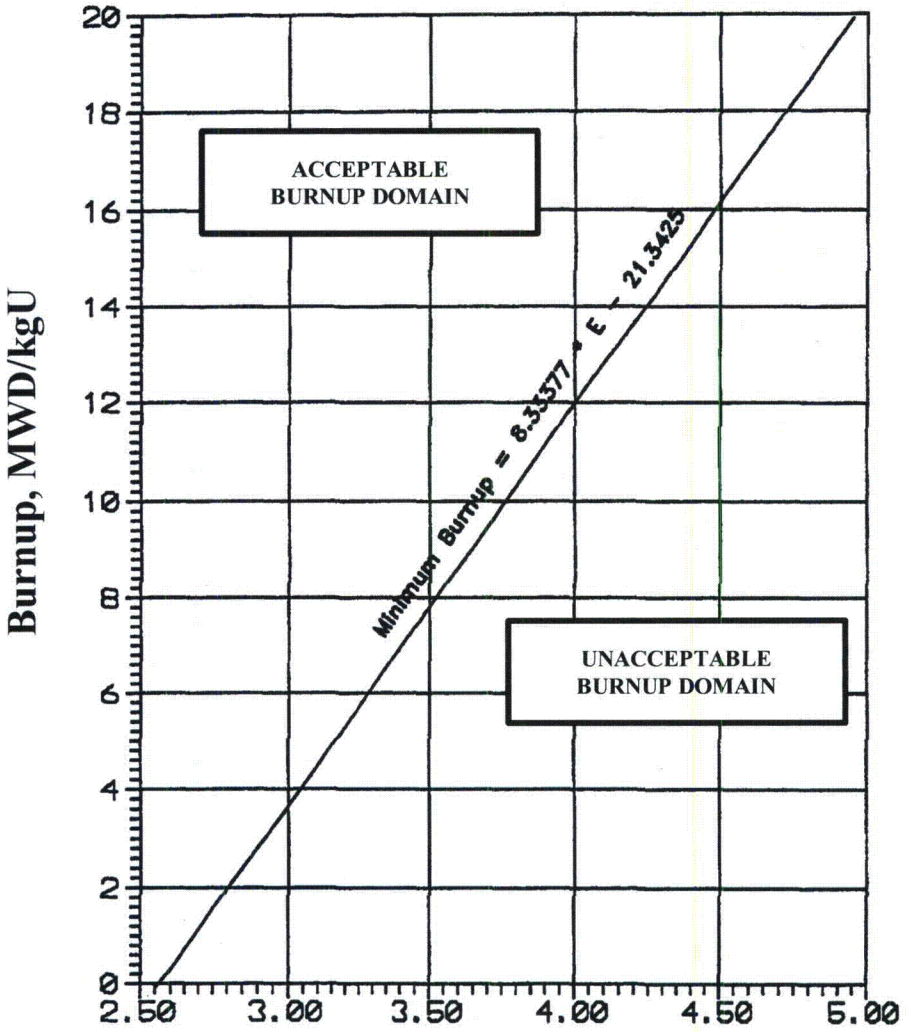

FIGURE 4.3-4
MINIMUM REQUIRED BURNUP FOR A CHECKERBOARD ARRANGEMENT OF 2 SPENT AND 2 NEW FUEL ASSEMBLIES OF 5 wt% U-235 ENRICHMENT (MAXIMUM)

5.7 Procedures, Programs, and Manuals (continued)

5.7.2.14 Ventilation Filter Testing Program (VFTP)

A program shall be established to implement the following required testing of Engineered Safety Feature (ESF) filter ventilation systems at the frequencies specified in accordance with Regulatory Guide 1.52, Revision 2; ASME N510-1989, and the exceptions noted for each ESF system in Tables 6.5-1, 6.5-2, 6.5-3, and 6.5-4 of the FSAR.

a. Demonstrate for each of the ESF systems that an inplace test of the high efficiency particulate air (HEPA) filters shows a penetration and system bypass within acceptance criterion when tested in accordance with Regulatory Guide 1.52, Revision 2, the exceptions noted for each ESF system in Tables 6.5-1, 6.5-2, 6.5-3, and 6.5-4 of the FSAR, and ASME N510-1989 at the system flowrate specified below.

ESF VENTILATION SYSTEM	ACCEPTANCE CRITERIA	FLOW RATE
~~Reactor Building Purge~~	~~< 1.00%~~	~~14,000 cfm ± 10%~~
Emergency Gas Treatment	< 0.05%	4,000 cfm ± 10%
Auxiliary Building Gas Treatment	< 0.05%	9,000 cfm ± 10%
Control Room Emergency	< 1.00%	4,000 cfm ± 10%

(continued)

5.7 Procedures, Programs, and Manuals

5.7.2.14 Ventilation Filter Testing Program (VFTP) (continued)

b. Demonstrate for each of the ESF systems that an inplace test of the charcoal adsorber shows a penetration and system bypass within acceptance criterion when tested in accordance with Regulatory Guide 1.52, Revision 2, the exceptions noted for each ESF system in Tables 6.5-1, 6.5-2, 6.5-3, and 6.5-4 of the FSAR, and ASME N510-1989 at the system flowrate specified below. |

ESF VENTILATION SYSTEM	ACCEPTANCE CRITERIA	FLOW RATE
~~Reactor Building Purge~~	~~< 1.00%~~	~~14,000 cfm ± 10%~~
Emergency Gas Treatment	< 0.05%	4,000 cfm ± 10%
Auxiliary Building Gas Treatment	< 0.05%	9,000 cfm ± 10%
Control Room Emergency	< 1.00%	4,000 cfm ± 10%

(continued)

5.7.2.14 Ventilation Filter Testing Program (VFTP) (continued)

c. Demonstrate for each of the ESF systems that a laboratory test of a sample of the charcoal adsorber, when obtained as described in Regulatory Guide 1.52, Revision 2, and the exceptions noted for each ESF system in Tables 6.5-1, 6.5-2, 6.5-3, and 6.5-4 of the FSAR, shows the methyl iodide penetration less than the value specified below when tested in accordance with ASTM D3803-1989 at a temperature of ≤ 30°C and greater than or equal to the relative humidity specified below.

ESF VENTILATION SYSTEM	METHYL IODIDE PENETRATION	RELATIVE HUMIDITY
~~Reactor Building Purge~~	~~< 10%~~	~~95%~~
Emergency Gas Treatment	< 0.175%	70%
Auxiliary Building Gas Treatment	< 0.175%	70%
Control Room Emergency	< 1.0%	70%

d. Demonstrate for each of the ESF systems that the pressure drop across the entire filtration unit is less than the value specified below when tested in accordance with Regulatory Guide 1.52, Revision 2, the exceptions noted for each ESF system in Tables 6.5-1, 6.5-2, 6.5-3, and 6.5-4 of the FSAR, and ASME N510-1989 at the system flowrate specified below.

ESF VENTILATION SYSTEM	PRESSURE DROP	FLOW RATE
~~Reactor Building Purge~~	~~< 4.7 inches water~~	~~14,000 cfm ± 10%~~
Emergency Gas Treatment	< 7.6 inches water	4,000 cfm ± 10%
Auxiliary Building Gas Treatment	< 7.6 inches water	9,000 cfm ± 10%
Control Room Emergency	< 3.5 inches water	4,000 cfm ± 10%

(continued)

5.7 Procedures, Programs, and Manuals

5.7.2.19 Containment Leakage Rate Testing Program (continued)

Leakage rate acceptance criteria are:

a. Containment overall leakage rate acceptance criterion is $\leq 1.0\ L_a$. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $< 0.60\ L_a$ for the combined Type B and Type C tests, and $\leq 0.75\ L_a$ for Type A tests.

b. Air lock testing acceptance criteria are:

1. Overall air lock leakage rate is $\leq 0.05\ L_a$ when tested at $\geq P_a$.

2. For each door, leakage rate is $\leq 0.01\ L_a$ when pressurized to ≥ 6 psig.

The provisions of SR 3.0.2 do not apply to the test frequencies specified in the Containment Leakage Rate Testing Program.

The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.

5.7.2.20 Control Room Envelope Habitability Program

A Control Room Envelope (CRE) Habitability Program shall be established and implemented to ensure that CRE habitability is maintained such that, with an OPERABLE Control Room Emergency Ventilation System (CREVS), CRE occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event, hazardous chemical release, or a smoke challenge. The program shall ensure that adequate radiation protection is provided to permit access and occupancy of the CRE under design basis accident (DBA) conditions without personnel receiving radiation exposures in excess of **the applicable regulatory requirement {i.e., 5 rem Total Effective Dose Equivalent (TEDE) for a fuel handling accident or** 5 rem whole body or its equivalent to any part of the body**}** for the duration of the accident. The program shall include the following elements:

a. The definition of the CRE and the CRE boundary.

b. Requirements for maintaining the CRE boundary in its design condition including configuration control and preventive maintenance.

5.7.2.20 Control Room Envelope Habitability Program (continued)

c. Requirements for (i) determining the unfiltered air inleakage past the CRE boundary into the CRE in accordance with the testing methods and at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and (ii) assessing CRE habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

d. Measurement, at designated locations, of the CRE pressure relative to all external areas adjacent to the CRE boundary during the pressurization mode of operation by one train of the CREVS, operating at the flow rate defined in the Ventilation Filter Testing Program (VFTP), at a Frequency of 18 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the 18 month assessment of the CRE boundary.

e. The quantitative limits on unfiltered air inleakage into the CRE. These limits shall be stated in a manner to allow direct comparison to the unfiltered air inleakage measured by the testing described in paragraph c. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of DBA consequences. Unfiltered air inleakage limits for hazardous chemicals must ensure that exposure of CRE occupants to these hazards will be within the assumptions in the licensing basis.

f. The provisions of SR 3.0.2 are applicable to the frequencies for assessing CRE habitability, determining CRE unfiltered inleakage, and measuring CRE pressure and assessing the CRE boundary as required by paragraphs c and d, respectively.

5.7.2.21 Battery Monitoring and Maintenance Program

This Program provides controls for battery restoration and maintenance. The program shall be in accordance with IEEE Standard (Std) 450-2002, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," as endorsed by Regulatory Guide 1.129, Revision 2 (RG), with RG exceptions and program provisions as identified below:

a. The program allows the following RG 1.129, Revision 2 exceptions:

1. **Battery temperature correction may be performed before or after conducting discharge tests.**

2. **RG 1.129, Regulatory Position 1, Subsection 2, "References," is not applicable to this program.**

3. **In lieu of RG 1.129, Regulatory Position 2, Subsection 5.2, "Inspections," the following shall be used: "Where reference is made to the pilot cell, pilot cell selection shall be based on the lowest voltage cell in the battery."**

4. **In Regulatory Guide 1.129, Regulatory Position 3, Subsection 5.4.1, "State of Charge Indicator," the following statements in paragraph (d) may be omitted: "When it has been recorded that the charging current has stabilized at the charging voltage for three consecutive hourly measurements, the battery is near full charge. These measurements shall be made after the initially high charging current decreases sharply and the battery voltage rises to approach the charger output voltage."**

5. **In lieu of RG 1.129, Regulatory Position 7, Subsection 7.6, "Restoration", the following may be used: "Following the test, record the float voltage of each cell of the string."**

b. **The program shall include the following provisions:**

1. **Actions to restore battery cells with float voltage < 2.13 V;**

2. **Actions to determine whether the float voltage of the remaining battery cells is ≥ 2.13 V when the float voltage of a battery cell has been found to be < 2.13 V;**

3. **Actions to equalize and test battery cells that had been discovered with electrolyte level below the top of the plates;**

4. **Limits on average electrolyte temperature, battery connection resistance, and battery terminal voltage; and**

5. **A requirement to obtain specific gravity readings of all cells at each discharge test, consistent with manufacturer recommendations.**

5.0 ADMINISTRATIVE CONTROLS

5.9 Reporting Requirements

The following reports shall be submitted in accordance with 10 CFR 50.4.

5.9.1 DELETED

5.9.2 Annual Radiological Environmental Operating Report

----------NOTE----------
A single submittal may be made for a multiple unit station. The submittal should combine sections common to all units at the station.

The Annual Radiological Environmental Operating Report covering the operation of the unit during the previous calendar year shall be submitted by May 15 of each year. The report shall include summaries, interpretations, and analyses of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in the Offsite Dose Calculation Manual (ODCM), and in 10 CFR 50, Appendix I, Sections IV.B.2, IV.B.3, and IV.C.

The Annual Radiological Environmental Operating Report shall include the results of analyses of all radiological environmental samples and of all environmental radiation measurements taken during the period pursuant to the locations specified in the table and figures in the ODCM, as well as summarized and tabulated results of these analyses and measurements in the format of the table in the Radiological Assessment Branch Technical Position, Revision 1, November 1979. ~~The report shall identify the TLD results that represent collocated dosimeters in relation to the NRC TLD program and the exposure period associated with each result.~~ In the event that some individual results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted in a supplementary report as soon as possible.

(continued)

APPENDIX B

TO FACILITY OPERATING LICENSE

ENVIRONMENTAL PROTECTION PLAN
(NON-RADIOLOGICAL)

FOR

WATTS BAR NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-391

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT

UNIT 2

ENVIRONMENTAL PROTECTION PLAN

(NON-RADIOLOGICAL)

TABLE OF CONTENTS

1.0 DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

Annually	Annually is once per calendar year at intervals of twelve (12) calendar months ± 30 days
Clean Water Act	Federal Water Pollution Control Act (FWPCA) as amended.
FES	Final Environmental Statement (NUREG-0498) issued December 1978 by the NRC to the TVA (Control No. 7901100061).
FES and Subsequent Supplements	Consists of the FES, FES Supplement 1, and FES Supplement 2
FES Supplement 1	Final Environmental Statement (NUREG-0498 Supplement 1) issued April 1995 by the NRC to the TVA (ADAMS Accession No. ML081430592).
FES Supplement 2	Final Environmental Statement (NUREG-0498 Supplement 2, Vol. 1 & Vol. 2) issued May 2013 by the NRC to the TVA (ADAMS Accession Nos. ML13144A092 & ML13144A093).
FWS	U.S. Fish and Wildlife Service
NPDES Permit	NPDES permit is the National Pollutant Discharge Elimination System Permit No. TN0020168 issued by the U.S. Environmental Protection Agency to the Tennessee Valley Authority (TVA). This permit authorizes TVA to discharge controlled waste water, from the Watts Bar Plant Unit 2 into the Tennessee River.
NRC	U.S. Nuclear Regulatory Commission
Plant	Plant refers to the Watts Bar Nuclear Plant, either Unit 1 or Unit 2.
Site	Onsite includes any area within the property owned by the TVA specifically described in the WBN FES. Offsite includes all other areas.
Station	Station refers to Watts Bar Nuclear Plant Unit 1 and Unit 2.
TVA	Tennessee Valley Authority
Unit	Unit refers to Unit 2 (i.e., WBN2) of the Watts Bar Nuclear Plant, as defined by its usage.
WBN	Watts Bar Nuclear Plant

2.0 LIMITING CONDITIONS FOR OPERATION (N/A)

None required

3.0 ENVIRONMENTAL MONITORING

None required[1]

[1] In consideration of the provisions of the Clean Water Act (33 USC §1251, et seq.) and in the interest of avoiding duplication of effort, the conditions and monitoring requirements related to water quality and aquatic biota are specified in the National Pollution Discharge Elimination System (NPDES) Permit No. TN0020168 issued by the U.S. Environmental Protection Agency to the Tennessee Valley Authority (TVA). This permit authorizes TVA to discharge controlled waste water from the Watts Bar Nuclear Plant Unit 2 into the Tennessee River.

Existing Watt Bar Unit 1 monitoring and reporting programs will continue to be followed as part of WBN dual-unit operation.

The Nuclear Regulatory Commission will be relying on the NPDES permit for protection of the aquatic environment from non-radiological effluents.

4.0 SPECIAL STUDIES AND REQUIREMENTS

4.1 Exceptional Occurrences

4.1.1 Unusual or Important Environmental Events

Requirements

The licensee shall record any occurrences of "Unusual or Important Environmental Events." "Unusual or Important Environmental Events" are those that potentially could cause or indicate environmental impact causally related with plant operation. The following are examples: excessive bird impact events; onsite plant or animal disease outbreaks; unusual mortality of any species protected by the Endangered Species Act of 1974; fish kills near the plant site; unanticipated or emergency discharges of waste water or chemical substances.

This special requirement shall commence with the date of issuance of the operating license and continue for the life of the plant, unless changed in accordance with Subsection 5.5.1.

Action

Should an "Unusual or Important Environmental Event" occur, the licensee shall make a prompt report to the NRC in accordance with the provisions of Subsections 5.4.2.a and 5.4.2.c, or Subsection 5.4.2.d.

4.1.2 Exceeding Limits of Other Relevant Permits

Requirement

The licensee shall notify the NRC of occurrences in which the limits specified, in relevant permits and certificates issued by other federal, state, and local governments are exceeded and which are reportable to the applicable agency.

This requirement shall commence with the date of issuance of the operating license and continue for the life of the plant, unless changed in accordance with Subsection 5.5.1.

Action

The licensee shall make a report to the NRC in accordance with the provisions of Subsections 5.4.2.b and 5.4.2.c, or Subsection 5.4.2.d in the event if a limit specified in a relevant permit or certificate issued by another federal, state, or local agency is exceeded and is reportable to the applicable agency.

4.2 Special Studies

None required at the present time.

5.0 ADMINISTRATIVE CONTROLS

5.1 Responsibility

The Plant Manager has responsibility for operating the plant in compliance with this Environmental Protection Plan.

5.2 Review and Audit

The licensee shall provide for review and audit of compliance with the Environmental Protection Plan. The audits shall be conducted independently of the Individual or groups responsible for performing the specific activity. A description of the organization structure utilized to achieve the independent review and audit function and results of the audit activities shall be maintained and made available for inspection.

5.2.1 Review

The licensee is responsible for the review of procedures for meeting the Environmental Protection Plan.

The above mentioned review shall be conducted on the following:

A. Proposed changes to the Environmental Protection Plan and evaluated impact of the change.

B. Proposed changes to station operating procedures, which affect the environmental effects of the station.

C. Proposed changes, construction, or modifications to station or unit equipment, or systems which might have an environmental impact, in order to determine the environmental impact of the change[2].

[2] Activities are excluded from this requirement if all measurable environmental effects are confined to on-site areas previously disturbed during site preparation and plant construction.

D. All routine reports prior to their submittals to NRC (described in Subsection 5.4.1).

E. All nonroutine reports prior to submittal of the written report (described in Subsections 5.4.a, b, and c).

F. Investigations of all reported instances of noncompliance with the Environmental Protection Plan, associated corrective actions, and measures taken to prevent recurrence.

5.2.2 Audit

The licensee shall conduct an audit on the environmental monitoring program. The audits shall be conducted independently of the individual or group responsible for performing the specific activity. Results of the audit activities shall be maintained and made available for inspection.

5.3 Changes in Station Design or Operation

Changes in station design or operation may be made subject to the following conditions:

A. The licensee may (1) make changes in the station design and operation, and (2) conduct tests and experiments not described in this document without prior Commission approval, unless the proposed change, test or experiment involves a change in the objectives of the Environmental Protection Plan[3] and/or an unreviewed environmental question of significant impact.

[3] This provision does not relieve the licensee of the requirements of 10 CFR 50.59.

B. A proposed change, test or experiment shall be deemed to involve an unreviewed environmental question if it concerns (1) a matter which may result in a significant increase in any adverse environmental impact previously evaluated in the final environmental statement (FES) and subsequent supplements as modified by testimony to the Atomic Safety and Licensing Board, supplements thereto, environmental impact appraisals, or in initial or final adjudicatory decisions; or (2) a matter not previously reviewed and evaluated in the documents specified in (1) of this section which may have a significant adverse environmental impact.

C. The licensee shall maintain records of changes in facility design or operation made pursuant to this subsection. The licensee shall also maintain records of tests ad experiments carried out pursuant to paragraph "A" of this Subsection. These records shall include a written change, test, or experiment does not involve an unreviewed environmental question or substantive impact or constitute a change in the objectives of the Environmental Protection Plan. The licensee shall furnish to the Commission, annually or at such shorter intervals as may be specified in the license, a report containing description, analyses, interpretations, and evaluations of such changes, tests, and experiments.

D. Changes in the special studies, if required in Section 4.2, which affects sampling frequency, location, gear, or replication shall be reported to the NRC within 30 days after their implementation, unless otherwise reported in accordance with Subsection 5.4.2. These reports shall describe the changes made, the reasons for making the changes, and an evaluation of the effectiveness of the revised program in assessing environmental impacts.

5.4 Station Reporting Requirements

5.4.1 Routine Reports

Annual Environmental Operation Report

A WBN dual-unit report on the environmental monitoring program for the previous year shall be submitted to the NRC separate from other NRC reporting requirements within 90 days following

each anniversary of issuance of the WBN1 operating license. The WBN1 operating license anniversary date is utilized as the basis for the WBN dual-unit anniversary date, since it was the basis for the initial and subsequent reports. The report shall include summaries, analyses, interpretations, and statistical evaluation of the results of the environmental monitoring required by special studies and requirements (Section 4) for the report period, including a comparison with preoperational studies, operating controls (as appropriate), and previous non-radiological environmental monitoring reports, and an assessment of the observed impacts of the station operation on the environment. If harmful effects or evidence of irreversible damage are suggested by the monitoring programs, the licensee shall provide a more detailed analysis of the data and a proposed course of action to alleviate the problem.

For those programs concerned with water quality or protection of aquatic biota, which are regulated under the Clean Water Act, the requirements of this section shall be satisfied by submitting to the NRC copies of the reports required by the NPDES permit (or otherwise required pursuant to the Clean Water Act), and in accordance with the frequency, content and schedules set forth by the agencies responsible for implementing the Clean Water Act.

In the event that some results are not available by the report date, the report shall be submitted noting and explaining the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

The Annual Report shall also include a summary of:

1. All Environmental Protection Plan noncompliances and the corrective actions taken to remedy them.
2. Changes made to applicable state and federal permits and certifications.
3. Changes to station design which could involve a significant environmental impact or change the findings of the FES and subsequent supplements.
4. All nonroutine reports submitted per Environmental Protection Plan Section 4.1.
5. Changes in the approved Environmental Protection Plan.

5.4.2 Nonroutine Reports

A report shall be submitted in the event that an "Unusual or Important Environmental Event," as specified in Subsection 4.1.1 occurs, or if another relevant permit is violated as specified in Subsection 4.1.2. The schedule and content for these nonroutine reports are described below.

5.4.2.a Prompt Report

Those events specified as requiring prompt reporting shall be reported within 24 hours by telephone, telegraph, or facsimile transmission to the NRC followed by a written report to the NRC within 30 days.

5.4.2.b Thirty Day Report

Those events not requiring a prompt report as described in Subsection 5.4.2.a shall be reported to the NRC within 30 days of their occurrence.

5.4.2.c Content of Nonroutine Reports

Written 30-day reports and, to the extent possible, the preliminary telephone, telegraph, or facsimile reports shall (a) describe, analyze, and evaluate the occurrence, including the extent and magnitude of the impact, (b) describe the cause of the occurrence, (c) indicate the action taken to correct the occurrence, and (d) indicate the corrective action taken (including any significant changes made in procedures) to preclude repetition of the occurrence and to prevent similar occurrences involving similar components or systems.

5.4.2.d Exceptions for Matters Regulated Under the Clean Water Act

For matters regulated under the Clean Water Act, the report schedules and content requirements described in Subsections 5.4.2.a, 5.4.2.b, and 5.4.2.c shall be satisfied by submitting, to the NRC copies of the reports as required by the NPDES permit (or other regulations pursuant to the Clean Water Act) and in accordance with the schedules and content requirements imposed thereby.

5.5 Changes in the Environmental Protection Plan and Permits

5.5.1 Changes in the Environmental Protection Plan

Requests for a change to the Environmental Protection Plan shall be submitted to the NRC for review and authorization per 10 CFR 50.90. The request shall include an evaluation of the environmental impact of the proposed change and a supporting justification. Implementation of such requested changes to the Environmental Protection Plan shall not commence prior to incorporation by the NRC of the specifications in the license.

5.5.2 Changes in Permits and Certifications

Changes and additions to required federal (other than NRC), state, local, and regional authority permits and certificates for the protection of the environment shall be reported to the NRC within 30 days. In the event that the licensee initiates or becomes aware of a request for changes to any of the water quality requirements, limits, or values stipulated in any certification or permit issued pursuant to the Clean Water Act, the NRC shall be notified within 30 days.

If a permit or certification, in part or in its entirety, is appealed and stayed, the NRC shall be notified within 30 days. If, as a result of the appeal process, the permit or certification requirements are changed, the change shall be dealt with as described in the previous paragraph of this section.

5.6 Records Retention

Records and logs relative to the environmental aspects of station operation shall be made and retained in a manner convenient for review and inspection. These records and logs shall be made available to NRC on request.

5.6.1 The following records shall be retained for the life of the station:

(a) Record of changes to the Environmental Protection Plan including, when applicable, records of NRC approval of such changes.

(b) Record of modifications to plant structures, systems, and components determined to potentially affect the continued protection of the environment.

(c) Record of changes to permits and certifications required by federal (other than the NRC), state, local, and regional authorities for the protection of the environment.

(d) Routine reports submitted to the NRC.

5.6.2 Records of the following shall be retained for a minimum of six (6) years:

(a) Review and audit activities.

(b) Events, and the reports thereon, which are the subjects of non-routine reports to the NRC.

5.6.3 Records associated with requirements of federal (other than the NRC), state, local, and regional authorities' permits and certificates for the protection of the environment shall be retained for the period established by the respective permit or certificate.

Freeman Studio of Design -- Financial Records -- Q1 2000

Freeman Studio of Design -- Sales Database-- Q1 2000

Watts Bar Nuclear Plant 2

Submittal of Developmental Revision H of the Unit 2 Technical Specification and Technical Specification Bases

Attachment 3
WBN Unit 2 TS and TSB Developmental Revision H

Watts Bar Nuclear Plant 2

Submittal of Developmental Revision H of the Unit 2 Technical Specification and Technical Specification Bases

Attachment 3
WBN Unit 2 TS and TSB Developmental Revision H

ATTACHMENT 2

Technical Specification Bases Changes (Mark-Up) for WBN Unit 2

BASES

LCO

5. Reactor Coolant System Pressure (Wide Range) (continued)

RCS pressure is also related to three decisions about depressurization. They are:

- to determine whether to proceed with primary system depressurization;
- to verify termination of depressurization; and
- to determine whether to close accumulator isolation valves during a controlled cooldown/depressurization.

A final use of RCS pressure is to determine whether to operate the pressurizer heaters.

RCS pressure is a Type A variable because the operator uses this indication to identify events and to monitor the cooldown of the RCS following a steam generator tube rupture (SGTR) or small break LOCA. Operator actions to maintain a controlled cooldown, such as adjusting steam generator (SG) pressure or level, would use this indication.

6. Reactor Vessel Water Level

~~Reactor Vessel Water Level, a non-Type A, Category 1 variable, is provided for verification and long term surveillance of core cooling. It is also used for accident diagnosis and to determine reactor coolant inventory adequacy.~~

Reactor Vessel Water Level, a Type A, Category 1 variable is provided for:

- **SI re-initiation criteria,**
- **Pressurizer Level Control,**
- **Criteria for manually re-starting ECCS pumps,**
- **Criteria for closing CLA isolation valves,**
- **RCS Pressure Control,**
- **Verification and long term surveillance of core cooling,**
- **Accident diagnosis,**
- **Determination of reactor coolant inventory adequacy, and**
- **Pressurizer heater control**

The Reactor Vessel Level Instrumentation System (RVLIS) provides a direct measurement of the liquid level above the bottom of the reactor

(continued)

B 3.3 INSTRUMENTATION

B 3.3.6 Containment Vent Isolation Instrumentation

BASES

BACKGROUND

Containment Vent Isolation Instrumentation closes the containment isolation valves in the Containment Purge System. This action isolates the containment atmosphere from the environment to minimize releases of radioactivity in the event of an accident. The Reactor Building Purge System may be in use during reactor operation and with the reactor shutdown.

Containment vent isolation is initiated by a safety injection (SI) signal or by manual actuation. The Bases for LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," discuss initiation of SI signals.

Redundant and independent gaseous radioactivity monitors measure the radioactivity levels of the containment purge exhaust, each of which will initiate its associated train of automatic Containment Vent Isolation upon detection of high gaseous radioactivity.

The Reactor Building Purge System has inner and outer containment isolation valves in its supply and exhaust ducts. This system is described in the Bases for LCO 3.6.3, "Containment Isolation Valves."

~~The plant design basis requires that when moving irradiated fuel in the Auxiliary Building and/or Containment with the Containment open to the Auxiliary Building ABSCE spaces, a signal from the spent fuel pool radiation monitors 0-RE-90-102 and -103 will initiate a Containment Ventilation Isolation (CVI) in addition to their normal function. In addition, a signal from the containment purge radiation monitors 2-RE-90-130, and -131 or other CVI signal will initiate that portion of the Auxiliary Building Isolation (ABI) normally initiated by the spent fuel pool radiation monitors. Additionally, a Containment Isolation Phase A (SI signal) from the operating unit, high temperature in the Auxiliary Building air intakes, or manual ABI will cause a CVI signal in the refueling unit. In the case where the containment of both units is open to the Auxiliary Building spaces, a CVI in one unit will initiate a CVI in the other unit in order to maintain those spaces open to the ABSCE. Therefore, the containment ventilation instrumentation must remain operable when moving irradiated fuel in the Auxiliary Building if the containment air locks, penetrations, equipment hatch, etc. are open to the Auxiliary Building ABSCE spaces.~~

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The containment isolation valves for the Reactor Building Purge System close within six seconds following the DBA. The containment vent isolation radiation monitors act as backup to the SI signal to ensure closing of the purge air system supply and exhaust valves. ~~They are also the primary means for automatically isolating containment in the event of a fuel handling accident during shutdown.~~ Containment isolation in turn ensures meeting the containment leakage rate assumptions of the safety analyses, and ensures that the calculated accidental offsite radiological doses are below 10 CFR 100 (Ref. 1) limits.

The Containment Vent Isolation instrumentation satisfies Criterion 3 of the NRC Policy Statement.

~~When moving irradiated fuel inside containment or in the Auxiliary Building with containment air locks or penetrations open to the Auxiliary Building ABSCE spaces, or when moving fuel in the Auxiliary Building with the containment equipment hatch open, the provisions to initiate a CVI from the spent fuel pool radiation monitors and to initiate an ABI (i.e., the portion of an ABI normally initiated by the spent fuel pool radiation monitors) from a CVI, including a CVI generated by the containment purge monitors, in the event of a fuel handling accident (FHA) must be in place and functioning. Additionally, a Containment Isolation Phase A (SI signal) from the operating unit, high temperature in the Auxiliary Building air intakes, or manual ABI will cause a CVI signal in the refueling unit. The containment equipment hatch cannot be open when moving irradiated fuel inside containment in accordance with Technical Specification 3.9.4.~~

~~The ABGTS is required to be operable during movement of irradiated fuel in the Auxiliary Building during any mode and during movement of irradiated fuel in the Reactor Building when the Reactor Building is established as part of the ABSCE boundary (see TS 3.3.8, 3.7.12, & 3.9.4). When moving irradiated fuel inside containment, at least one train of the containment purge system must be operating or the containment must be isolated. When moving irradiated fuel in the Auxiliary Building during times when the containment is open to the Auxiliary Building ABSCE spaces, containment purge can be operated, but operation of the system is not required. However, whether the containment purge system is operated or not in this configuration, all containment ventilation isolation valves and associated instrumentation must remain operable.~~

(continued)

BASES

~~APPLICABLE SAFETY ANALYSES (continued)~~

~~This requirement is necessary to ensure a CVI can be accomplished from the spent fuel pool radiation monitors in the event of an FHA in the Auxiliary Building. Additionally, a Containment Isolation Phase A (SI signal) from the operating unit, high temperature in the Auxiliary Building air intakes, or manual ABI will cause a CVI signal in the refueling unit.~~

LCO

The LCO requirements ensure that the instrumentation necessary to initiate Containment Vent Isolation, listed in Table 3.3.6-1, is OPERABLE.

1. Manual Initiation

   The LCO requires two channels OPERABLE. The operator can initiate Containment Vent Isolation at any time by using either of two switches in the control room or from local panel(s). Either switch actuates both trains. This action will cause actuation of all components in the same manner as any of the automatic actuation signals. These manual switches also initiate a Phase A isolation signal.

   The LCO for Manual Initiation ensures the proper amount of redundancy is maintained in the manual actuation circuitry to ensure the operator has manual initiation capability.

   Each channel consists of one selector switch and the interconnecting wiring to the actuation logic cabinet.

2. Automatic Actuation Logic and Actuation Relays

   The LCO requires two trains of Automatic Actuation Logic and Actuation Relays OPERABLE to ensure that no single random failure can prevent automatic actuation.

   Automatic Actuation Logic and Actuation Relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b, SI. The applicable MODES and specified conditions for the containment vent isolation portion of the SI Function is different and less restrictive than those for the SI role. If one or more of the SI Functions becomes inoperable in such a manner that only the Containment Vent Isolation Function is affected, the Conditions applicable to the SI Functions need not be entered. The less restrictive Actions specified for inoperability of the Containment Vent Isolation Functions specify sufficient compensatory measures for this case.

(continued)

BASES

LCO (continued)

3. Containment Radiation

The LCO specifies two required channels of radiation monitors to ensure that the radiation monitoring instrumentation necessary to initiate Containment Vent Isolation remains OPERABLE.

For sampling systems, channel OPERABILITY involves more than OPERABILITY of the channel electronics. OPERABILITY may also require correct valve lineups and sample pump operation, as well as detector OPERABILITY, if these supporting features are necessary for trip to occur under the conditions assumed by the safety analyses.

Only the Allowable Value is specified for the Containment Purge Exhaust Radiation Monitors in the LCO. The Allowable Value is based on expected concentrations for a small break LOCA, which is more restrictive than 10 CFR 100 limits. The Allowable Value specified is more conservative than the analytical limit assumed in the safety analysis in order to account for instrument uncertainties appropriate to the trip function. The actual nominal Trip Setpoint is normally still more conservative than that required by the Allowable Value. If the setpoint does not exceed the Allowable Value, the radiation monitor is considered OPERABLE.

4. Safety Injection (SI)

Refer to LCO 3.3.2, Function 1, for all initiating Functions and requirements.

APPLICABILITY

The Manual Initiation, Automatic Actuation Logic and Actuation Relays, Safety Injection, and Containment Radiation Functions are required OPERABLE in MODES 1, 2, 3, and 4~~, and during movement of irradiated fuel assemblies within containment~~. Under these conditions, the potential exists for an accident that could release significant fission product radioactivity into containment. Therefore, the Containment Vent Isolation Instrumentation must be OPERABLE in these MODES. See additional discussion in the Background and Applicable Safety Analysis sections.

While in MODES 5 and 6~~ without fuel handling in progress~~, the Containment Vent Isolation Instrumentation need not be OPERABLE since the potential for radioactive releases is minimized and operator action is sufficient to ensure post accident offsite doses are maintained within the limits of Reference 1.

(continued)

BASES

ACTIONS

B.1 (continued)

Instrumentation" and allows periodic testing to be conducted while at power without causing an actual actuation. The delay for entering the Required Actions relieves the administrative burden of entering the Required Actions for isolation valves inoperable solely due to the performance of surveillance testing on the actuation logic and is acceptable based on the OPERABILITY of the opposite train.

~~A Note is added stating that Condition B is only applicable in MODE 1, 2, 3, or 4.~~

~~C.1 and C.2~~

~~Condition C applies to all Containment Vent Isolation Functions and addresses the train orientation of the SSPS and the master and slave relays for these Functions. It also addresses the failure of multiple radiation monitoring channels, or the inability to restore a single failed channel to OPERABLE status in the time allowed for Required Action A.1. If a train is inoperable, multiple channels are inoperable, or the Required Action and associated Completion Time of Condition A are not met, operation may continue as long as the Required Action to place and maintain containment purge and exhaust isolation valves in their closed position is met or the applicable Conditions of LCO 3.9.4, "Containment Penetrations," are met for each valve made inoperable by failure of isolation instrumentation. The Completion Time for these Required Actions is Immediately.~~

~~A Note states that Condition C is only applicable during movement of irradiated fuel assemblies within containment.~~

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.6-1 determines which SRs apply to which Containment Vent Isolation Functions.

SR 3.3.6.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value.

(continued)

B 3.3 INSTRUMENTATION

B 3.3.8 Auxiliary Building Gas Treatment (ABGTS) Actuation Instrumentation

BASES

BACKGROUND

The ABGTS ensures that radioactive materials in the fuel building atmosphere following ~~a fuel handling accident or~~ a loss of coolant accident (LOCA) are filtered and adsorbed prior to exhausting to the environment. The system is described in the Bases for LCO 3.7.12, "Auxiliary Building Gas Treatment System (ABGTS)." The system initiates filtered exhaust of air from the fuel handling area, ECCS pump rooms, and penetration rooms automatically following receipt of a fuel pool area high radiation signal or a Containment Phase A Isolation signal. Initiation may also be performed manually as needed from the main control room.

~~High area radiation, monitored by either of two monitors, provides ABGTS initiation. Each ABGTS train is initiated by high radiation detected by a channel dedicated to that train. There are a total of two channels, one for each train. High radiation detected by any monitor or a~~ **A** Phase A isolation signal from the Engineered Safety Features Actuation System (ESFAS) initiates auxiliary building isolation and starts the ABGTS. These actions function to prevent exfiltration of contaminated air by initiating filtered ventilation, which imposes a negative pressure on the Auxiliary Building Secondary Containment Enclosure (ABSCE).

~~The plant design basis requires that when moving irradiated fuel in the Auxiliary Building and/or Containment with the Containment and/or annulus open to the Auxiliary Building ABSCE spaces, a signal from the spent fuel pool radiation monitors 0-RE-90-102 and -103 will initiate a Containment Ventilation Isolation (CVI) in addition to their normal function. In addition, a signal from the containment purge radiation monitors 2-RE-90-130, and -131 or other CVI signal will initiate that portion of the Auxiliary Building Isolation (ABI) normally initiated by the spent fuel pool radiation monitors. Additionally, a Containment Isolation Phase A (SI signal) from the operating unit, high temperature in the Auxiliary Building air intakes, or manual ABI will cause a CVI signal in the refueling unit. In the case where the containment of both units is open to the Auxiliary Building spaces, a CVI in one unit will initiate a CVI in the other unit in order to maintain those spaces open to the ABSCE. Therefore, the containment ventilation instrumentation must remain operable when moving irradiated fuel in the Auxiliary Building if the containment and/or annulus air locks, penetrations, equipment hatch, etc. are open to the Auxiliary Building ABSCE spaces.~~

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The ABGTS ensures that radioactive materials in the ABSCE atmosphere following ~~a fuel handling accident or~~ a LOCA are filtered and adsorbed prior to being exhausted to the environment. This action reduces the radioactive content in the auxiliary building exhaust following a LOCA or fuel handling accident so that offsite doses remain within the limits specified in 10 CFR 100 (Ref. 1).

The ABGTS Actuation Instrumentation satisfies Criterion 3 of the NRC Policy Statement.

~~When moving irradiated fuel inside containment or in the Auxiliary Building with containment air locks or penetrations open to the Auxiliary Building ABSCE spaces, or when moving fuel in the Auxiliary Building with the containment equipment hatch open, the provisions to initiate a CVI from the spent fuel pool radiation monitors and to initiate an ABI (i.e., the portion of an ABI normally initiated by the spent fuel pool radiation monitors) from a CVI, including a CVI generated by the containment purge monitors, in the event of a fuel handling accident (FHA) must be in place and functioning. Additionally, a Containment Isolation Phase A (SI signal) from the operating unit, high temperature in the Auxiliary Building air intakes, or manual ABI will cause a CVI signal in the refueling unit. The containment equipment hatch cannot be open when moving irradiated fuel inside containment in accordance with Technical Specification 3.9.4.~~

~~The ABGTS is required to be operable during movement of irradiated fuel in the Auxiliary Building during any mode and during movement of irradiated fuel in the Reactor Building when the Reactor Building is established as part of the ABSCE boundary (see TS 3.3.8, 3.7.12, & 3.9.4). When moving irradiated fuel inside containment, at least one train of the containment purge system must be operating or the containment must be isolated. When moving irradiated fuel in the Auxiliary Building during times when the containment is open to the Auxiliary Building ABSCE spaces, containment purge can be operated, but operation of the system is not required. However, whether the containment purge system is operated or not in this configuration, all containment ventilation isolation valves and associated instrumentation must remain operable.~~

~~This requirement is necessary to ensure a CVI can be accomplished from the spent fuel pool radiation monitors in the event of a FHA in the Auxiliary Building. Additionally, a Containment Isolation Phase A (SI signal) from the operating unit, high temperature in the Auxiliary Building air intakes, or manual ABI will cause a CVI signal in the refueling unit. In the case where the containment of both units is open to the Auxiliary Building spaces, a CVI in one unit will initiate a CVI in the other unit in order to maintain those spaces open to the ABSCE.~~

(continued)

BASES (continued)

LCO

The LCO requirements ensure that instrumentation necessary to initiate the ABGTS is OPERABLE.

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate the ABGTS at any time by using either of two switches in the control room. This action will cause actuation of all components in the same manner as any of the automatic actuation signals.

The LCO for Manual Initiation ensures the proper amount of redundancy is maintained in the manual actuation circuitry to ensure the operator has manual initiation capability.

Each channel consists of one hand switch and the interconnecting wiring to the actuation logic relays.

~~2. Fuel Pool Area Radiation~~

~~The LCO specifies two required Fuel Pool Area Radiation Monitors to ensure that the radiation monitoring instrumentation necessary to initiate the ABGTS remains OPERABLE. One radiation monitor is dedicated to each train of ABGTS.~~

~~For sampling systems, channel OPERABILITY involves more than OPERABILITY of channel electronics. OPERABILITY may also require correct valve lineups, sample pump operation, and filter motor operation, as well as detector OPERABILITY, if these supporting features are necessary for trip to occur under the conditions assumed by the safety analyses.~~

~~Only the Allowable Value is specified for the Fuel Pool Area Radiation Monitors in the LCO. The Allowable Value specified is more conservative than the analytical limit assumed in the safety analysis in order to account for instrument uncertainties appropriate to the trip function. The actual nominal Trip Setpoint is normally still more conservative than that required by the Allowable Value. If the measured setpoint does not exceed the Allowable Value, the radiation monitor is considered OPERABLE.~~

~~3.~~2. Containment Phase A Isolation

Refer to LCO 3.3.2, Function 3.a, for all initiating Functions and requirements.

(continued)

BASES (continued)

APPLICABILITY

The manual ABGTS initiation must be OPERABLE in MODES 1, 2, 3, and 4 ~~and when moving irradiated fuel assemblies in the fuel handling area~~ to ensure the ABGTS operates to remove fission products associated with leakage after a LOCA or a fuel handling accident. The Phase A ABGTS Actuation is also required in MODES 1, 2, 3, and 4 to remove fission products caused by post LOCA Emergency Core Cooling Systems leakage.

~~High radiation initiation of the ABGTS must be OPERABLE in any MODE during movement of irradiated fuel assemblies in the fuel handling area to ensure automatic initiation of the ABGTS when the potential for a fuel handling accident exists.~~

While in MODES 5 and 6 ~~without fuel handling in progress~~, the ABGTS instrumentation need not be OPERABLE ~~since a fuel handling accident cannot occur~~. See additional discussion in the Background and Applicable Safety Analysis sections.

ACTIONS

The most common cause of channel inoperability is outright failure or drift sufficient to exceed the tolerance allowed by unit specific calibration procedures. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. If the Trip Setpoint is less conservative than the tolerance specified by the calibration procedure, the channel must be declared inoperable immediately and the appropriate Condition entered.

A Note has been added to the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.8-1 in the accompanying LCO. The Completion Time(s) of the inoperable channel(s)/train(s) of a Function will be tracked separately for each Function starting from the time the Condition was entered for that Function.

(continued)

BASES

ACTIONS (continued)

A.1

Condition A applies to the actuation logic train function from the Phase A Isolation~~, the radiation monitor functions,~~ and the manual initiation function. Condition A applies to the failure of a single actuation logic train~~, radiation monitor channel,~~ or manual channel. If one channel or train is inoperable, a period of 7 days is allowed to restore it to OPERABLE status. If the train cannot be restored to OPERABLE status, one ABGTS train must be placed in operation. This accomplishes the actuation instrumentation function and places the unit in a conservative mode of operation. The 7-day Completion Time is the same as is allowed if one train of the mechanical portion of the system is inoperable. The basis for this time is the same as that provided in LCO 3.7.12.

B.1.1, B.1.2, B.2

Condition B applies to the failure of two ABGTS actuation logic signals from the Phase A Isolation~~, two radiation monitors,~~ or two manual channels. The Required Action is to place one ABGTS train in operation immediately. This accomplishes the actuation instrumentation function that may have been lost and places the unit in a conservative mode of operation. The applicable Conditions and Required Actions of LCO 3.7.12 must also be entered for the ABGTS train made inoperable by the inoperable actuation instrumentation. This ensures appropriate limits are placed on train inoperability as discussed in the Bases for LCO 3.7.12.

Alternatively, both trains may be placed in the emergency radiation protection mode. This ensures the ABGTS Function is performed even in the presence of a single failure.

~~C.1~~

~~Condition C applies when the Required Action and associated Completion Time for Condition A or B have not been met and irradiated fuel assemblies are being moved in the fuel building. Movement of irradiated fuel assemblies in the fuel building must be suspended immediately to eliminate the potential for events that could require ABGTS actuation. Performance of these actions shall not preclude moving a component to a safe position.~~

(continued)

BASES

ACTIONS (continued)

~~D~~C.1 and ~~D~~C.2

Condition ~~D~~ C applies when the Required Action and associated Completion Time for Condition A or B have not been met and the plant is in MODE 1, 2, 3, or 4. The plant must be brought to a MODE in which the LCO requirements are not applicable. To achieve this status, the plant must be brought to MODE 3 within 6 hours and MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.8-1 determines which SRs apply to which ABGTS Actuation Functions.

~~SR 3.3.8.1~~

~~Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.~~

~~Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.~~

~~The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.3.8.2~~

~~A COT is performed once every 92 days on each required channel to ensure the entire channel will perform the intended function. This test verifies the capability of the instrumentation to provide the ABGTS actuation. The Frequency of 92 days is based on the known reliability of the monitoring equipment and has been shown to be acceptable through operating experience. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as left and as found setting are consistent with those established by the setpoint methodology.~~

SR 3.3.8.~~3~~1

SR 3.3.8.~~3~~1 is the performance of a TADOT. This test is a check of the manual actuation functions and is performed every 18 months. Each manual actuation function is tested up to, and including, the relay coils. In some instances, the test includes actuation of the end device (e.g., pump starts, valve cycles, etc.). The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions tested have no setpoints associated with them.

~~SR 3.3.8.4~~

~~A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. The Frequency is based on operating experience and is consistent with the typical industry refueling cycle. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as left and as found setting are consistent with those established by the setpoint methodology.~~

REFERENCES

1. Title 10, Code of Federal Regulations, Part 100.11, "Determination of Exclusion Area, Low Population Zone, and Population Center Distance."