TVA TENNESSEE VALLEY AUTHORITY

Sequoyah Nuclear Plant, Post Office Box 2000, Soddy Daisy, Tennessee 37384

June 30, 2025

10 CFR 50.4
10 CFR 50.71(e)

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Sequoyah Nuclear Plant, Units 1 and 2
Renewed Facility Operating License Nos. DPR-77 and DPR-79
NRC Docket Nos. 50-327 and 50-328

Subject: **Revisions to the Sequoyah Nuclear Plant Units 1 and 2 Technical Requirements Manual**

References:
1. NRC Letter to TVA, "Issuance of Exemption to 10 CFR [50.] 71(e)(4) for the Sequoyah Nuclear Plant, Units 1 and 2 (TAC Nos. MA0646 and MA0647)," dated March 9, 1998

2. TVA Letter to NRC, "Revisions to the Sequoyah Nuclear Plant Units 1 and 2 Technical Requirements Manual," dated October 10, 2023

Pursuant to 10 CFR 50.71(e) and the Reference 1 letter, updates to the Sequoyah Nuclear Plant (SQN) Updated Final Safety Analysis Report (UFSAR) for both Units 1 and 2 are to be submitted within 180 days following each Unit 2 refueling outage, but not to exceed 24 months between successive revisions. The SQN Technical Requirements Manual (TRM) is incorporated by reference into the SQN UFSAR. This letter provides NRC updates to the TRM since the update provided in the Reference 2 letter. The enclosure to this letter provides a description of the TRM revisions and copy of the TRM including a revised effective page listing.

There are no new regulatory commitments contained in this letter. If you have any questions, please contact Mr. Rick Medina, SQN Site Compliance Manager, at (423) 843-8129 or rmedina4@tva.gov.

I certify that I am duly authorized by TVA, and that, to the best of my knowledge and belief, the information contained herein accurately presents changes made since the previous submittal, necessary to reflect information and analyses submitted to the Commission or prepared pursuant to Commission requirements.

Respectfully,

Kevin M. Michael

Kevin M. Michael
Site Vice President
Sequoyah Nuclear Plant

Enclosure:
Description of Revisions for the Sequoyah Nuclear Plant (SQN) Units 1 and 2, Technical Requirements Manual (TRM)

cc (Enclosure):
NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Sequoyah Nuclear Plant

ENCLOSURE

DESCRIPTION OF REVISIONS FOR THE SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2, TECHNICAL REQUIREMENTS MANUAL (TRM)

Technical Requirements Manual (TRM) Revisions

TRM Revision 69 for Units 1 and 2 implemented changes to Technical Requirement (TR) 8.3.4, “Plant Calorimetric Measurement.” The change implements site operating experience that has shown the leading edge flow meter (LEFM) transducers do not couple with the associated window face, resulting in LEFM being nonfunctional when starting up from a reactor shut down until the unit is approximately 40-50 percent reactor thermal power (RTP). The change revises the Applicability to a threshold value that provides reasonable assurance the LEFM will be functional while low enough to provide detection of LEFM issues. Use of the LEFM for conducting Technical Specification Surveillance Requirement 3.3.1.2 is the preferred method but not necessary. However, the inability to use the LEFM’s measurement accuracy would result in entering into TR 8.3.4 Condition A resulting in a penalty to RTP. Associated TR Bases are updated for the above changes.

TRM Revision 70 for Units 1 and 2 revises TR 8.1.3, “Position Indication System – Shutdown,” providing additional time to assess the system condition prior to opening the reactor trip breakers. The change relaxes the acceptance tolerance of the group demand position indication to plus/minus 12 steps, modifies Condition A to permit 15 minutes to restore the group demand position indicator to functional, creates Condition B to address when Condition A is met. The new Condition B retains the requirement to open the reactor trip breakers, but also provides an alternate allowance to initiate action to fully insert all rods. Technical Requirements Verification (TRV) 8.1.3.1 Frequency is modified to allow 4 hours to complete the verification after the reactor trip breakers are closed if not completed within the previous 31 days and then every 31 days thereafter. The title of the TR 8.1.3 is revised to Rod Position Indication – Shutdown. Associated TR Bases are updated for the above changes.

TRM Revision 71 is associated with Amendment Nos. 367 and 361 for Units 1 and 2 respectively, approved by NRC on March 26, 2024. These amendments are in regard to the new hydrologic analysis presented in the Updated Final Safety Analysis Report. TR 8.7.2, “Flood Protection,” was revised to incorporate changes to ensure the flood protection actions will be taken in a timely manner. The revision is made to be consistent with the early flood warning conditions based on the results of the approved hydrologic analysis and with coordination with the TVA River Forecasting Center.

TRM Revision 72 for Units 1 and 2 extends Frequencies for verification of boron concentration levels in the boric acid tank and the refuel water storage tank (RWST) of TR 8.1.1, “Boration Systems – Operating,” and TR 8.1.2, “Boration Systems – Shutdown.” The Frequencies have been extended from every 7days to every 31 days.

Attachment:

Sequoyah Nuclear Plant, Technical Requirements Manual

ATTACHMENT

SEQUOYAH NUCLEAR PLANT
TECHNICAL REQUIREMENTS MANUAL

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT

UNITS 1 AND 2

TECHNICAL REQUIREMENTS MANUAL

EFFECTIVE PAGE LISTING

Page	Revision
Table of Contents page i	12/15/23
Table of Contents page ii	10/23/15
6.0-1	10/23/15
7.1-1	10/23/15
7.1-2	10/23/15
7.1-3	10/23/15
7.2-1	10/23/15
7.2-2	10/23/15
7.2-3	10/23/15
7.3-1	10/23/15
7.3-2	10/23/15
7.3-3	10/23/15
7.3-4	10/23/15
7.3-5	10/23/15
7.3-6	10/23/15
7.4-1	10/23/15
7.4-2	10/23/15
7.4-3	10/23/15
7.4-4	10/23/15
7.4-5	10/23/15
7.4-6	10/23/15
7.5-1	10/23/15
7.5-2	10/23/15

EFFECTIVE PAGE LISTING

EFFECTIVE PAGE LISTING

EFFECTIVE PAGE LISTING

EFFECTIVE PAGE LISTING

EFFECTIVE PAGE LISTING

EFFECTIVE PAGE LISTING

REVISION LISTING

Revision	Date
Initial Issue, Revision 0	02/02/98
Revision 1	10/01/98
Revision 2	02/12/99
Revision 3	03/18/99
Revision 4	09/14/99
Revision 5	10/24/99
Revision 6	09/29/99
Revision 7	12/09/99
Revision 8	03/23/00
Revision 9	06/02/00
Revision 10	06/13/00
Revision 11	06/15/00
Revision 12	11/09/00
Revision 13	01/04/01
Revision 14	04/05/01
Revision 15	07/11/01
Revision 16	04/05/02
Revision 17	03/27/02
Revision 18	07/19/02
Revision 19	07/25/02
Revision 20	10/11/02
Revision 21	03/06/03
Revision 22	08/11/03
Revision 23	09/14/03
Revision 24	09/28/03
Revision 25	10/31/03
Revision 26	09/26/03
Revision 27	09/26/03
Revision 28	05/15/04
Revision 29	10/13/04
Revision 30	10/13/04
Revision 31	04/22/05
Revision 32	05/27/05
Revision 33	06/20/05
Revision 34	06/24/05
Revision 35	10/12/05
Revision 36	10/19/05
Revision 37	01/20/06
Revision 38	03/08/06
Revision 39	03/17/06
Revision 40	04/26/06
Revision 41	07/25/06
Revision 42	09/15/06
Revision 43	10/17/06
Revision 44	11/04/06
Revision 45	05/18/09
Revision 46	11/29/10
Revision 47	09/27/12
Revision 48	11/05/14
Revision 49	10/23/15

REVISION LISTING

Revision	Date
Revision 50	11/25/15
Revision 51	07/01/16
Revision 52	08/29/16
Revision 53	08/31/16
Revision 54	09/27/16
Revision 55	10/07/16
Revision 56	04/04/16
Revision 57	01/27/17
Revision 58	04/24/17
Revision 59	08/23/17
Revision 60	06/08/18
Revision 61	02/21/19
Revision 62	07/11/19
Revision 63	01/19/21
Revision 64	03/22/21
Revision 65	09/15/21
Revision 66	05/31/22
Revision 67	02/06/23
Revision 68	05/31/22
Revision 69	10/24/23
Revision 70	12/15/23
Revision 71	05/10/24
Revision 72	10/22/24

Table of Contents

Table of Contents

6.0 INTRODUCTION

BACKGROUND

The Technical Requirements Manual (TRM) is a Sequoyah Nuclear Plant (SQN) controlled document. The TRM contains requirements similar to the Technical Specifications, which are not required to be located in the Technical Specifications, because they do not meet the requirements of 10 CFR50.36. Although these requirements are excluded from Technical Specifications, they are still requirements placed upon plant operation due to regulatory issues.

The TRM provides one location for relocated items in a consistent format. The Technical Requirements are formatted in a manner consistent with NRC Inspection Manual Chapter 0326, Operability Determinations & Functionality Assessments for Conditions Adverse to Quality. Although many of the terms defined in the Technical Specifications apply within the TRM, the TRM contains additional Definitions which are specific to the TRM and not defined in the Technical Specification Definitions.

REGULATORY STATUS/REQUIREMENTS

The requirements in the TRM are part of the licensing basis for Sequoyah Units 1 and 2. Violations of the TRM requirements should be documented in the corrective action program. Deviations from the TRM will be screened for reportability in accordance with the corrective action program.

CHANGES TO THE TRM

Design modifications, procedure changes, license amendments, etc. have the potential to affect the TRM. If this occurs, the initiating department must follow the administrative controls in NPG-SPP-03.12, "Technical Specifications/Licenses and Amendments." This process requires that the TRM's Technical Requirements be considered in a manner similar to the Technical Specifications when evaluating changes. Changes to the TRM will be reported, as a minimum, to the NRC at a frequency consistent with 10 CFR 50.71(e). Related 10 CFR 50.59 evaluations will be reported as part of the 10 CFR 50.59(d) report to the NRC.

7.0 USE AND APPLICATION

7.1 Definitions

---NOTES---

1. Terms are defined in Section 1.1 of the Technical Specifications and are applicable throughout the Technical Requirements Manual (TRM) and Bases. Definitions specific to the TRM will be defined in this section.

2. The defined terms of this section and the Technical Specifications (TS) appear in capitalized type and are applicable throughout the TRM and the TRM Bases.

Term	Definition
CHANNEL FUNCTIONAL TEST	A CHANNEL FUNCTIONAL TEST consists of: a. Analog channels - the injection of a simulated signal into the channel as close to the sensor as practicable to verify FUNCTIONALITY including alarm and/or trip functions. b. Bistable channels - the injection of a simulated signal into the sensor to verify FUNCTIONALITY including alarm and/or trip functions. c. Digital channels - the injection of a simulated signal into the channel as close to the sensor input to the process racks as practicable to verify FUNCTIONALITY including alarm and/or trip functions.
FUNCTIONAL — FUNCTIONALITY	FUNCTIONALITY is an attribute of an structures, systems and components (SSCs) that is not controlled by TSs. An SSC not controlled by TSs is FUNCTIONAL or has FUNCTIONALITY when it is capable of performing its function(s) as set forth in the current licensing basis (CLB). These CLB function(s) may include the capability to perform a necessary and related support function for an SSCs controlled by TSs.

7.1 Definitions

MODE

A MODE shall correspond to any one inclusive combination of core reactivity condition, power level, average reactor coolant temperature, and reactor vessel head closure bolt tensioning specified in Table 1.1-1 with fuel in the reactor vessel.

Table 1.1-1
MODES

MODE	TITLE	REACTIVITY CONDITION (k_{eff})	% RATED THERMAL POWER[a]	AVERAGE REACTOR COOLANT TEMPERATURE (°F)
1	Power Operation	≥ 0.99	> 5	NA
2	Startup	≥ 0.99	≤ 5	NA
3	Hot Standby	< 0.99	NA	≥ 350
4	Hot Shutdown[b]	< 0.99	NA	$350 > T_{avg} > 200$
5	Cold Shutdown[b]	< 0.99	NA	≤ 200
6	Refueling[c]	NA	NA	NA

(a) Excluding decay heat.
(b) All reactor vessel head closure bolts fully tensioned.
(c) One or more reactor vessel head closure bolts less than fully tensioned.

OPERABLE – OPERABILITY

A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).

7.1 Definitions

TECHNICAL REQUIREMENT (TR)	TECHNICAL REQUIREMENTS specify minimum requirements for ensuring safe operation of the unit. The Contingency Measures associated with a TR state Conditions that typically describe the ways in which the requirements of the TR can fail to be met. Specified with each stated condition are Contingency Measures and Restoration Time(s).
TECHNICAL REQUIREMENTS VERIFICATION (TRV)	TECHNICAL REQUIREMENTS VERIFICATIONS are requirements relating to test, calibration, or inspection to assure that the necessary FUNCTIONALITY of systems and components is maintained, that facility operation will be maintained within the current licensing bases, and that the TECHNICAL REQUIREMENT (TR) will be met.

7.0 USE AND APPLICATION

7.2 Logical Connectors

PURPOSE	The purpose of this section is to explain the meaning of logical connectors. Logical connectors are used in Technical Requirements Manual (TRM) to discriminate between, and yet connect, discrete Conditions, Contingency Measures, Restoration Times, Verifications, and Frequencies. The only logical connectors that appear in the TRM are <u>AND</u> and <u>OR</u>. The physical arrangement of these connectors constitutes logical conventions with specific meanings.
BACKGROUND	Several levels of logic may be used to state Contingency Measures. These levels are identified by the placement (or nesting) of the logical connectors and by the number assigned to each Contingency Measure. The first level of logic is identified by the first digit of the number assigned to a Contingency Measure and the placement of the logical connector in the first level of nesting (i.e., left justified with the number of the Contingency Measure). The successive levels of logic are identified by additional digits of the Contingency Measure number and by successive indentations of the logical connectors. When logical connectors are used to state a Condition, Restoration Time, Verification, or Frequency, only the first level of logic is used, and the logical connector is left justified with the statement of the Condition, Restoration Time, Verification, or Frequency.
EXAMPLES	The following examples illustrate the use of logical connectors.

7.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 7.2-1

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. TR not met.	A.1 Verify . . . AND A.2 Restore . . .	

In this example the logical connector AND is used to indicate that when in Condition A, both Contingency Measures A.1 and A.2 must be completed.

7.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 7.2-2

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. TR not met.	A.1 Trip . . . OR A.2.1 Verify . . . AND A.2.2.1 Reduce OR A.2.2.2 Perform OR A.3 Align . . .	

This example represents a more complicated use of logical connectors. Contingency Measures A.1, A.2, and A.3 are alternative choices, only one of which must be performed as indicated by the use of the logical connector OR and the left justified placement. Any one of these three Contingency Measures may be chosen. If A.2 is chosen, then both A.2.1 and A.2.2 must be performed as indicated by the logical connector AND. Contingency Measure A.2.2 is met by performing A.2.2.1 or A.2.2.2. The indented position of the logical connector OR indicates that A.2.2.1 and A.2.2.2 are alternative choices, only one of which must be performed.

7.0 USE AND APPLICATION

7.3 Restoration Times

PURPOSE	The purpose of this section is to establish the Restoration Time convention and to provide guidance for its use.
BACKGROUND	TECHNICAL REQUIREMENTS (TR) specify minimum requirements for ensuring safe operation of the unit. The CONTINGENCY MEASURES associated with a TR state Conditions that typically describe the ways in which the requirements of the TR can fail to be met. Specified with each stated Condition are Contingency Measure(s) and Restoration Time(s).

DESCRIPTION

The Restoration Time is the amount of time allowed for completing a Contingency Measure. It is referenced to the time of discovery of a situation (e.g., nonfunctional equipment or variable not within limits) that requires entering a CONTINGENCY MEASURES Condition unless otherwise specified, providing the unit is in a MODE or specified condition stated in the Applicability of the TR. Contingency Measures must be completed prior to the expiration of the specified Restoration Time. A CONTINGENCY MEASURE Condition remains in effect and the Contingency Measures apply until the Condition no longer exists or the unit is not within the TR Applicability.

If situations are discovered that require entry into more than one Condition at a time within a single TR (multiple Conditions), the Contingency Measures for each Condition must be performed within the associated Restoration Time. When in multiple Conditions, separate Restoration Times are tracked for each Condition starting from the time of discovery of the situation that required entry into the Condition.

Once a Condition has been entered, subsequent trains, subsystems, components, or variables expressed in the Condition, discovered to be nonfunctional or not within limits, will not result in separate entry into the Condition, unless specifically stated. The Contingency Measures of the Condition continue to apply to each additional failure, with Restoration Times based on initial entry into the Condition.

However, when a subsequent train, subsystem, component, or variable expressed in the Condition is discovered to be nonfunctional or not within limits, the Restoration Time(s) may be extended. To apply this Restoration Time extension, two criteria must first be met. The subsequent nonfunctionality:

a. Must exist concurrent with the first nonfunctionality and

DESCRIPTION (continued)

b. Must remain nonfunctional or not within limits after the first nonfunctionality is resolved.

The total Restoration Time allowed for completing a Contingency Measure to address the subsequent nonfunctionality shall be limited to the more restrictive of either:

a. The stated Restoration Time, as measured from the initial entry into the Condition, plus an additional 24 hours or

b. The stated Restoration Time as measured from discovery of the subsequent nonfunctionality.

The above Restoration Time extensions do not apply to those TRM Sections that have exceptions that allow completely separate re-entry into the Condition (for each train, subsystem, component, or variable expressed in the Condition) and separate tracking of Restoration Times based on this re-entry. These exceptions are stated in individual TRM Sections.

The above Restoration Time extension does not apply to a Restoration Time with a modified "time zero." This modified "time zero" may be expressed as a repetitive time (i.e., "once per 8 hours," where the Restoration Time is referenced from a previous completion of the Contingency Measure versus the time of Condition entry) or as a time modified by the phrase "from discovery . . ."

EXAMPLES The following examples illustrate the use of Restoration Times with different types of Conditions and changing Conditions.

EXAMPLE 7.3-1

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
B. Contingency Measure and associated Restoration Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

EXAMPLES (continued)

Condition B has two Contingency Measures. Each Contingency Measure has its own separate Restoration Time. Each Restoration Time is referenced to the time that Condition B is entered.

The Contingency Measures of Condition B are to be in MODE 3 within 6 hours AND in MODE 5 within 36 hours. A total of 6 hours is allowed for reaching MODE 3 and a total of 36 hours (not 42 hours) is allowed for reaching MODE 5 from the time that Condition B was entered. If MODE 3 is reached within 3 hours, the time allowed for reaching MODE 5 is the next 33 hours because the total time allowed for reaching MODE 5 is 36 hours.

If Condition B is entered while in MODE 3, the time allowed for reaching MODE 5 is the next 36 hours.

EXAMPLE 7.3-2

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. One pump Nonfunctional.	A.1 Restore pump to FUNCTIONAL status.	7 days
B. Contingency Measure and associated Restoration Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

When a pump is declared Nonfunctional, Condition A is entered. If the pump is not restored to FUNCTIONAL status within 7 days, Condition B is also entered and the Restoration Time clocks for Contingency Measures B.1 and B.2 start. If the Nonfunctional pump is restored to FUNCTIONAL status after Condition B is entered, Conditions A and B are exited, and therefore, the Contingency Measures of Condition B may be terminated.

EXAMPLES (continued)

When a second pump is declared Nonfunctional while the first pump is still Nonfunctional, Condition A is not re-entered for the second pump. TR 7.5.3 is entered, since the CONTINGENCY MEASURES do not include a Condition for more than one Nonfunctional pump. The Restoration Time clock for Condition A does not stop after TR 7.5.3 is entered, but continues to be tracked from the time Condition A was initially entered.

While in TR 7.5.3, if one of the Nonfunctional pumps is restored to FUNCTIONAL status and the Restoration Time for Condition A has not expired, TR 7.5.3 may be exited and operation continued in accordance with Condition A.

While in TR 7.5.3, if one of the Nonfunctional pumps is restored to FUNCTIONAL status and the Restoration Time for Condition A has expired, TR 7.5.3 may be exited and operation continued in accordance with Condition B. The Restoration Time for Condition B is tracked from the time the Condition A Restoration Time expired.

On restoring one of the pumps to FUNCTIONAL status, the Condition A Restoration Time is not reset, but continues from the time the first pump was declared Nonfunctional. This Restoration Time may be extended if the pump restored to FUNCTIONAL status was the first Nonfunctional pump. A 24 hour extension to the stated 7 days is allowed, provided this does not result in the second pump being nonfunctional for > 7 days.

EXAMPLES (continued)

EXAMPLE 7.3-3

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. One Function X train Nonfunctional.	A.1 Restore Function X train to FUNCTIONAL status.	7 days
B. One Function Y train Nonfunctional.	B.1 Restore Function Y train to FUNCTIONAL status.	72 hours
C. One Function X train Nonfunctional. AND One Function Y train Nonfunctional.	C.1 Restore Function X train to FUNCTIONAL status. OR C.2 Restore Function Y train to FUNCTIONAL status.	72 hours 72 hours

When one Function X train and one Function Y train are Nonfunctional, Condition A and Condition B are concurrently applicable. The Restoration Times for Condition A and Condition B are tracked separately for each train starting from the time each train was declared nonfunctional and the Condition was entered. A separate Restoration Time is established for Condition C and tracked from the time the second train was declared Nonfunctional (i.e., the time the situation described in Condition C was discovered).

EXAMPLES (continued)

If Contingency Measure C.2 is completed within the specified Restoration Time, Conditions B and C are exited. If the Restoration Time for Contingency Measure A.1 has not expired, operation may continue in accordance with Condition A. The remaining Restoration Time in Condition A is measured from the time the affected train was declared nonfunctional (i.e., initial entry into Condition A).

It is possible to alternate between Conditions A, B, and C in such a manner that operation could continue indefinitely without ever restoring systems to meet the TR. However, doing so would be inconsistent with the basis of the Restoration Times. Therefore, there shall be administrative controls to limit the maximum time allowed for any combination of Conditions that result in a single contiguous occurrence of failing to meet the TR. These administrative controls shall ensure that the Restoration Times for those Conditions are not inappropriately extended.

IMMEDIATE RESTORATION TIME	When "Immediately" is used as a Restoration Time, The Contingency Measure should be pursued without delay and in a controlled manner.

7.0 USE AND APPLICATION

7.4 Frequency

PURPOSE	The purpose of this section is to define the proper use and application of Frequency requirements.
DESCRIPTION	Each TECHNICAL REQUIREMENTS VERIFICATION (TRV) has a specified Frequency in which the TRV must be met in order to meet the associated TR. An understanding of the correct application of the specified Frequency is necessary for compliance with the TRV.

The "specified Frequency" is referred to throughout this section and each of the TR Section TRV Applicability. The "specified Frequency" consists of the requirements of the Frequency column of each TRV as well as certain Notes in the Verification column that modify performance requirements.

Sometimes special situations dictate when the requirements of a TRV are to be met. They are "otherwise stated" conditions allowed by TRV 7.6.1. They may be stated as clarifying Notes in the TRV, as part of the TRV or both.

Situations where a TRV could be required (i.e., its frequency could expire), but where it is not possible or not desired that it be performed until sometime after the associated TR is within its Applicability, represent potential conflicts. To avoid these conflicts, the TRV (i.e., the TRV or the Frequency) is stated such that it is only "required" when it can be and should be performed.

The use of "met" or "performed" in these instances conveys specific meanings. A TRV is "met" only when the acceptance criteria are satisfied. Known failure of the requirements of a TRV, even without a TRV specifically being "performed," constitutes a TRV not "met." "Performance" refers only to the requirement to specifically determine the ability to meet the acceptance criteria.

Some TRVs contain notes that modify the Frequency of performance or the conditions during which the acceptance criteria must be satisfied. For these TRVs, the MODE entry restrictions may not apply. Such a TRV is not required to be performed prior to entering a MODE or other specified condition in the Applicability of the associated TR if any of the following three conditions are satisfied:

DESCRIPTION (continued)

a. The TRV is not required to be met in the MODE or other specified condition to be entered, or

b. The TRV is required to be met in the MODE or other specified condition to be entered, but has been performed within the specified Frequency (i.e., it is current) and is known not to be failed, or

c. The TRV is required to be met, but not performed, in the MODE or other specified condition to be entered, and is known not to be failed.

Examples 7.4-3 and 7.4-4 discuss these special situations.

EXAMPLES

The following examples illustrate the various ways that Frequencies are specified. In these examples, the Applicability of the TR (TR not shown) is MODES 1, 2, and 3.

EXAMPLES (continued)

EXAMPLE 7.4-1

TECHNICAL REQUIREMENTS VERIFICATION

VERIFICATION	FREQUENCY
Perform CHANNEL CHECK.	12 hours

Example 7.4-1 contains the type of TRV most often encountered in the Technical Requirements Manual (TRM). The Frequency specifies an interval (12 hours) during which the associated TRV must be performed at least one time. Performance of the TRV initiates the subsequent interval. Although the Frequency is stated as 12 hours, an extension of the time interval to 1.25 times the stated Frequency is allowed by TRV 7.6.2 for operational flexibility. The measurement of this interval continues at all times, even when the TRV is not required to be met per TRV 7.6.1 (such as when the equipment is nonfunctional, a variable is outside specified limits, or the unit is outside the Applicability of the TR). If the interval specified by TRV 7.6.2 is exceeded while the unit is in a MODE or other specified condition in the Applicability of the TR, and the performance of the TRV is not otherwise modified (refer to Example 7.4-3), then TRV 7.6.3 becomes applicable.

EXAMPLES (continued)

EXAMPLE 7.4-2

TECHNICAL REQUIREMENTS VERIFICATION

VERIFICATION	FREQUENCY
Verify flow is within limits.	Once within 12 hours after ≥ 25% RTP AND 24 hours thereafter

Example 7.4-2 has two Frequencies. The first is a one time performance Frequency, and the second is of the type shown in Example 7.4-1. The logical connector "AND" indicates that both Frequency requirements must be met. Each time reactor power is increased from a power level < 25% RTP to ≥ 25% RTP, the TRV must be performed within 12 hours.

The use of "once" indicates a single performance will satisfy the specified Frequency (assuming no other Frequencies are connected by "AND").

EXAMPLES (continued)

EXAMPLE 7.4-3

TECHNICAL REQUIREMENTS VERIFICATION

VERIFICATION	FREQUENCY
----------------------------NOTE-------------------------- Not required to be performed until 12 hours after ≥ 25% RTP. ---	
Perform channel adjustment.	7 days

The interval continues, whether or not the unit operation is < 25% RTP between performances.

As the Note modifies the required performance of the TRV, it is construed to be part of the "specified Frequency." Should the 7 day interval be exceeded while operation is < 25% RTP, this Note allows 12 hours after power reaches ≥ 25% RTP to perform the TRV. The TRV is still considered to be performed within the "specified Frequency." Therefore, if the TRV were not performed within the 7 day (plus the extension allowed by TRV 7.6.2) interval, but operation was < 25% RTP, it would not constitute a failure of the TRV or failure to meet the TR.

Once the unit reaches 25% RTP, 12 hours would be allowed for completing the TRV. If the TRV were not performed within this 12 hour interval (plus the extension allowed by TRV 7.6.2), there would then be a failure to perform a TRV within the specified Frequency.

EXAMPLES (continued)

EXAMPLE 7.4-4

TECHNICAL REQUIREMENTS VERIFICATION

VERIFICATION	FREQUENCY
-----------------------------NOTE--------------------------- Only required to be met in MODE 1. --- Verify leakage rates are within limits.	24 hours

Example 7.4-4 specifies that the requirements of this TRV do not have to be met until the unit is in MODE 1. The interval measurement for the Frequency of this TRV continues at all times, as described in Example 7.4-1. However, the Note constitutes an "otherwise stated" exception to the Applicability of this TRV. Therefore, if the TRV were not performed within the 24 hour interval (plus the extension allowed by TRV 7.6.2), but the unit was not in MODE 1, there would be no failure of the TRV nor failure to meet the TR. Therefore, no violation occurs when changing MODES, even with the 24 hour Frequency exceeded, provided the MODE change was not made into MODE 1.

7.0 USE AND APPLICATION

7.5 TECHNICAL REQUIREMENT (TR) Applicability

TR 7.5.1 TRs shall be met during the MODES or other specified conditions in the Applicability.

TR 7.5.2 Upon discovery of a failure to meet a TR, the Contingency Measures of the associated Conditions shall be met.

TR 7.5.3 When a TR is not met and the associated Contingency Measures are not satisfied (or an associated Contingency Measure is not provided), the equipment subject to the TR is in a nonconforming condition. In this situation, appropriate actions shall be taken as necessary to provide assurance of continued safe plant operations. In addition, a Condition Report shall be initiated and an assessment of reasonable assurance of safety shall be conducted. Items to be considered for this assessment include the following:

- Availability of redundant or backup equipment;
- Compensatory measures, including limited administrative controls;
- Safety function and events protected against;
- Probability of needing the safety function;
- Conservatism and margins; and
- Probabilistic Risk Assessment or Individual Plant Evaluation results that determine how operating the plant in the manner proposed will impact core damage frequency.

If this assessment concludes that safety is sufficiently assured, the facility may continue to operate while prompt corrective action is taken.

TR 7.5.4 When a TR is not met entry into a MODE or other specified condition in the Applicability shall only be made:

a. When the associated Contingency Measures to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time;

b. After performance of a risk assessment addressing Nonfunctional systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate; exceptions to this TR are stated in the individual TR; or

c. When an allowance is stated in the individual value, parameter, or other TR.

This TR shall not prevent entry into MODES or other specified conditions in the Applicability that are required to comply with Contingency Measures or that are part of a shutdown of the unit.

7.5 TECHNICAL REQUIREMENT (TR) Applicability

TR 7.5.5 Equipment removed from service or declared Nonfunctional to comply with Contingency Measures may be returned to service under administrative control solely to perform testing required to demonstrate its FUNCTIONALITY or the FUNCTIONALITY of other equipment. This is an exception to TR 7.5.2 for the system returned to service under administrative control to perform the testing required to demonstrate FUNCTIONALITY.

7.0 USE AND APPLICATION

7.6 TECHNICAL REQUIREMENTS VERIFICATION (TRV) Applicability

TRV 7.6.1 TRVs shall be met during the MODES or other specified conditions in the Applicability for individual TRs, unless otherwise stated in the TRV. Failure to meet a TRV, whether such failure is experienced during the performance of the TRV or between performances of the TRV, shall be failure to meet the TR. Failure to perform a TRV within the specified Frequency shall be failure to meet the TR. TRVs do not have to be performed on nonfunctional equipment or variables outside specified limits.

TRV 7.6.2 Each TRV shall be performed within the specified time interval with a maximum allowable extension not to exceed 25% of the specified TRV interval.

TRV 7.6.3 When it is discovered that a TRV Frequency (including the 25% extension) has not been met, the equipment subject to the TRV is Nonfunctional.

8.1 REACTIVITY CONTROL SYSTEMS

8.1.1 Boration Systems - Operating

TECHNICAL REQUIREMENT (TR)

TR 8.1.1 The Boration System shall be FUNCTIONAL consisting of at least two of the following three flow paths:

a. The flow path from a boric acid tank via a FUNCTIONAL boric acid transfer pump and a FUNCTIONAL charging pump to the Reactor Coolant System (RCS).

b. Two flow paths from the OPERABLE refueling water storage tank via two FUNCTIONAL charging pumps to the RCS.

---NOTE---
In MODE 3, one charging pump may be made incapable of injecting to support transition into or from the Applicability of Technical Specification LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System, "for up to 4 hours or until the temperature of all RCS cold legs exceeds LTOP arming temperature (350°F) specified in the Pressure and Temperature Limits Report (PTLR) plus 25°F, whichever comes first.

APPLICABILITY: MODES 1, 2, and 3.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A One required boron injection flow path Nonfunctional.	A.1 Restore the required Nonfunctional flow path to FUNCTIONAL status.	72 hours
B. Required Contingency Measures and associated Restoration Time of Condition A not met. <u>OR</u> Two required boron injection flow paths Nonfunctional.	B.1 Evaluate in accordance with TR 7.5.3.	Immediately

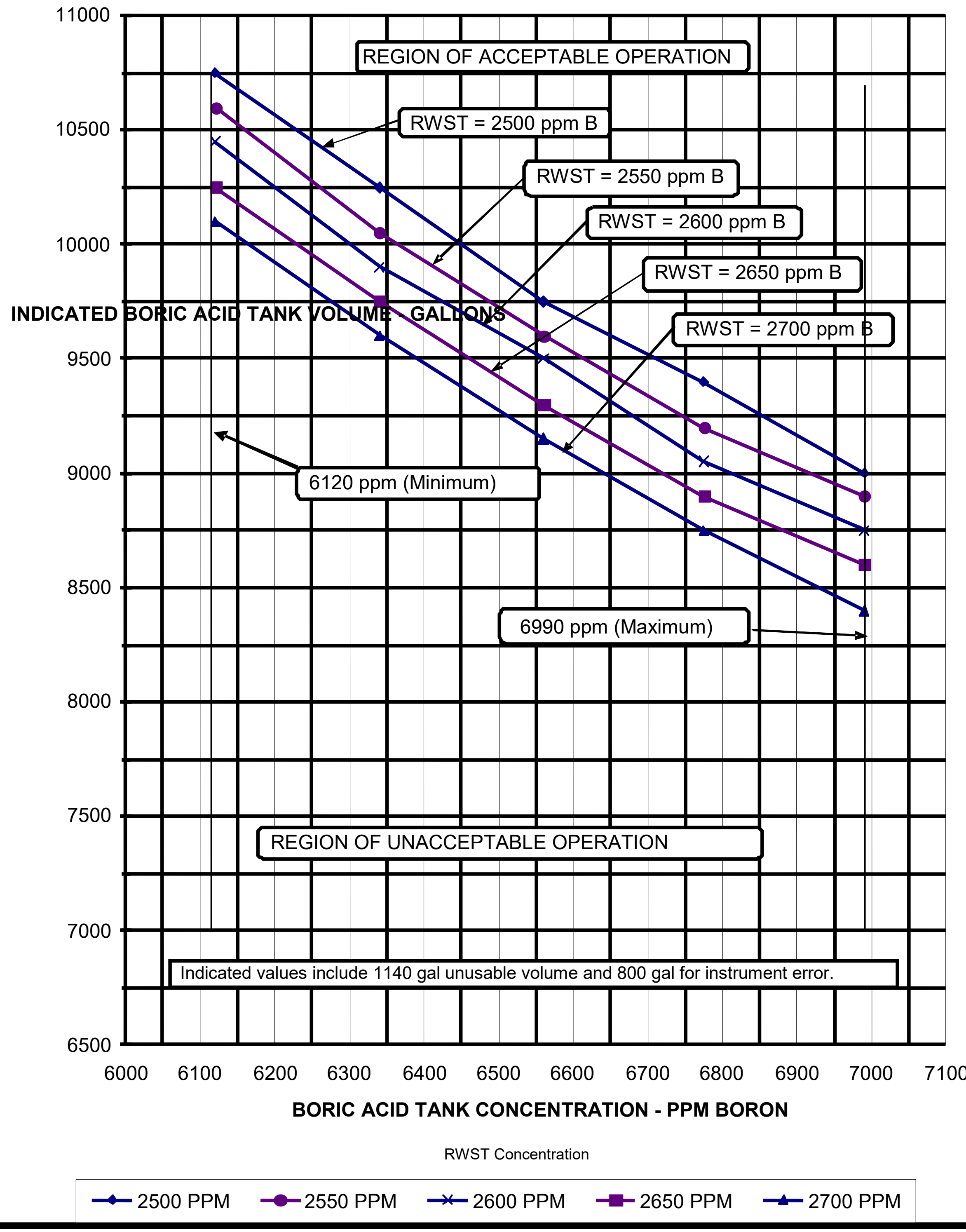
TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.1.1.1	-----------------------------NOTE----------------------------------- Only required to be met if a boric acid tank is a required water source. -- Verify the temperature of the boric acid tank area, and areas containing flow path components from the boric acid tanks to the blending tee is greater than or equal to 63°F.	7 days AND Once within 6 hours after area temperature is less than 63°F AND 24 hours thereafter until area temperature is greater than or equal to 63°F.
8.1.1.2	-----------------------------NOTE----------------------------------- Only required to be met if a boric acid tank is a required water source. -- Verify the boron concentration in the boric acid tank is in accordance with Figure 8.1.1-1.	31 days
8.1.1.3	-----------------------------NOTE----------------------------------- Only required to be met if a boric acid tank is a required water source. -- Verify the borated water volume in the boric acid tank is in accordance with Figure 8.1.1-1.	7 days

TECHNICAL REQUIREMENTS VERIFICATION (continued)

TRV	VERIFICATION	FREQUENCY
8.1.1.4	Verify each manual, power operated, or automatic valve in the boron injection flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.	31 days
8.1.1.5	Verify each automatic valve in the boron injection flow path actuates to its correct position on a safety injection test signal.	18 months
8.1.1.6	Verify the flow path from the boric acid tanks via a boric acid transfer pump and a charging pump to the RCS delivers greater than or equal to 40 gpm.	18 months
8.1.1.7	Verify each charging pump develops a discharge pressure of greater than or equal to 2400 psig during recirculation flow.	In accordance with the Inservice Testing Program

TRM FIGURE 8.1.1-1 (Units 1 & 2)
BORIC ACID TANK LIMITS
BASED ON RWST BORON CONCENTRATION



BASES

8.1.1 Boration Systems – Operating

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid transfer pumps, and 5) offsite power supply or an emergency power supply from OPERABLE diesel generators.

With the RCS average temperature above 350°F, a minimum of two boron injection systems (involving two charging pumps,) are required to ensure single functional capability in the event an assumed failure renders one of the flow paths nonfunctional. The boration capability of either flow path is sufficient to provide a SHUTDOWN MARGIN (SDM) from expected operating conditions of 1.6% Δk/k after xenon decay and cooldown to 200°F. The maximum expected boration capability requirement occurs at near EOL from full power peak xenon conditions and requires borated water from a boric acid tank in accordance with Figure 8.1.1-1 and additional makeup water from either: (1) the common boric acid tank and/or batching, or (2) a minimum of 26,000 gallons of 2500 ppm borated water from the refueling water storage tank. With the refueling water storage tank as the only borated water source, a minimum of 62,000 gallons of 2500 ppm borated water is required.

TR 8.1.1 is modified by a Note. Operation in MODE 3 with one charging pump made incapable of injecting, in order to facilitate entry into or exit from the Applicability of Technical Specification LCO 3.4.12, “Low Temperature Overpressure Protection (LTOP) System, “ is necessary for plants with an LTOP arming temperature at or near the MODE 3 boundary temperature of 350°F. Technical Specifications LCO 3.4.12 requires that certain pumps be rendered incapable of injecting at and below the LTOP arming temperature. When this temperature is at or near the MODE 3 boundary temperature, time is needed to make a pump incapable of injecting prior to entering the LTOP Applicability, and provide time to restore the nonfunctional pump to FUNCTIONAL status on exiting the LTOP Applicability.

The boric acid tanks, pumps, valves, and piping contain a boric acid solution concentration of between 3.5% and 4.0% by weight. To ensure that the boric acid remains in solution, the air temperature is monitored in strategic locations. By ensuring the air temperature remains at 63°F or above, a 5°F margin is provided to ensure the boron will not precipitate out. To provide operational flexibility, if the area temperature should fall below the required value, the solution temperature (as determined by the pipe or tank wall temperature) will be monitored at an increased frequency to compensate for the lack of solution temperature alarm in the main control room.

8.1 REACTIVITY CONTROL SYSTEMS

8.1.2 Boration Systems - Shutdown

TECHNICAL REQUIREMENT (TR)

TR 8.1.2 The Boration System shall be FUNCTIONAL consisting of the following:

a. A flow path from a boric acid tank via a FUNCTIONAL boric acid transfer pump and a FUNCTIONAL charging pump to the Reactor Coolant System (RCS), OR

b. A flow path from the FUNCTIONAL refueling water storage tank (RWST) via a FUNCTIONAL charging pump to the RCS.

APPLICABILITY: MODES 4, 5, and 6.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. -------------NOTE----------- Only applicable in MODE 4 and 5. --------------------------------- Required boron injection flow path Nonfunctional.	A.1 Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of Technical Specification 3.1.1. AND A.2 Restore the Nonfunctional flow path to FUNCTIONAL status.	Immediately Immediately

CONTINGENCY MEASURES (continued)

CONDITION	CONTINGENCY MEASURES		RESTORATION TIME
B. -------------NOTE----------- Only applicable in MODE 6. --------------------------------- Required boron injection flow path Nonfunctional.	B.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	B.2	Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet Technical Specification 3.9.1.	Immediately
C. Required Contingency Measures and associated Restoration Time of Condition A or B not met.	C.1	Evaluate in accordance with TR 7.5.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.1.2.1	----------------------------NOTE---------------------------------- Only required to be met if the RWST is the required water source. -- Verify the temperature of the RWST solution is greater than or equal to 60°F.	24 hours

TECHNICAL REQUIREMENTS VERIFICATION (continued)

TRV	VERIFICATION	FREQUENCY
8.1.2.2	-----------------------------NOTE---------------------------------- Only required to be met if a boric acid tank is the required water source. --- Verify the temperature of the boric acid tank area, and areas containing flow path components from the boric acid tanks to the blending tee is greater than or equal to 63°F.	7 days <u>AND</u> Once within 6 hours after area temperature is less than 63°F <u>AND</u> 24 hours thereafter until area temperature is greater than or equal to 63°F.
8.1.2.3	-----------------------------NOTE---------------------------------- Only required to be met if a boric acid tank is the required water source. --- Verify the boron concentration in the boric acid tank is greater than 6120 ppm and less than 6990 ppm.	31 days
8.1.2.4	-----------------------------NOTE---------------------------------- Only required to be met if a boric acid tank is the required water source. --- Verify the borated water volume in the boric acid tank is greater than or equal to 6400 gallons.	7 days

TECHNICAL REQUIREMENTS VERIFICATION (continued)

TRV	VERIFICATION	FREQUENCY
8.1.2.5	-----------------------------NOTE---------------------------------- Only required to be met if the RWST is the required water source. -- Verify the RWST boron concentration is greater than or equal to 2500 ppm.	31 days
8.1.2.6	-----------------------------NOTE---------------------------------- Only required to be met if the RWST is the required water source. -- Verify the borated water volume in the RWST is greater than or equal to 55,000 gallons.	7 days
8.1.2.7	Verify each manual, power operated, or automatic valve in the required boron injection flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.	31 days
8.1.2.8	Verify the charging pump develops a discharge pressure of greater than or equal to 2400 psig during recirculation flow.	In accordance with the Inservice Testing Program

8.1 REACTIVITY CONTROL SYSTEMS

8.1.2 Boration Systems - Shutdown

BASES

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid transfer pumps, and 5) offsite power supply or an emergency power supply from OPERABLE diesel generators.

The boric acid tanks, pumps, valves, and piping contain a boric acid solution concentration of between 3.5% and 4.0% by weight. To ensure that the boric acid remains in solution, the air temperature is monitored in strategic locations. By ensuring the air temperature remains at 63°F or above, a 5°F margin is provided to ensure the boron will not precipitate out. To provide operational flexibility, if the area temperature should fall below the required value, the solution temperature (as determined by the pipe or tank wall temperature) will be monitored at an increased frequency to compensate for the lack of solution temperature alarm in the main control room.

With the RCS temperature below 350°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and operations involving positive reactivity additions that could result in loss of required shutdown margin (SDM) (MODE 4 or 5) or boron concentration (MODE 6) in the event the single injection system becomes nonfunctional. Suspending positive reactivity additions that could result in failure to meet minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than or equal to that required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with positive MTC must be evaluated to ensure they do not result in a loss of required SDM.

The boron capability required below 350°F is sufficient to provide a SDM of 1.6% $\Delta k/k$ after xenon decay and cooldown from 350°F to 200°F, and a SDM of 1% $\Delta k/k$ after xenon decay and cooldown from 200°F to 140°F. This condition requires either 6400 gallons of 6120 ppm borated water from the boric acid storage tanks or 13,400 gallons of 2500 ppm borated water from the refueling water storage tank (RWST).

The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics. The 6400 gallon limit in the boric acid tank for Modes 4, 5, and 6 is based on 4,431 gallons required for SDM, 1,140 gallons for the unusable volume in the heel of the tank, 800 gallons for instrument error, and an additional 29 gallons due to rounding up. The 55,000 gallon limit in the refueling water storage tank for modes 4, 5, and 6 is based upon 22,182 gallons that is undetectable due to lower tap location, 19,197 gallons for instrument error, 13,400 gallons required for SDM, and an additional 221 gallons due to rounding up.

BASES

8.1.2 Boration Systems – Shutdown (continued)

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.5 and 9.5 for the solution recirculated within containment after a loss of coolant accident. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

The FUNCTIONALITY of one boron injection system during refueling ensures that this system is available for reactivity control while in MODE 6.

8.1 REACTIVITY CONTROL SYSTEMS

8.1.3 Rod Position Indication System - Shutdown

TECHNICAL REQUIREMENT (TR)

TR 8.1.3 The group demand position indicator shall be FUNCTIONAL and capable of determining within +/- 12 steps, the demand position for each shutdown or control rod not fully inserted.

APPLICABILITY: MODES 3, 4 and 5 with the reactor trip breakers in the closed position.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. Less than required group demand position indicator(s) FUNCTIONAL.	A.1 Restore required group demand position indicator(s) to FUNCTIONAL.	15 minutes
B. Required Contingency Measure and associated Restoration Time of Condition A not met.	B.1 Initiate action to fully insert all rods. OR B.2 Open the reactor trip breakers	Immediately Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.1.3.1	Verify each required group demand position indicator(s) is FUNCTIONAL by movement of the associated control rod at least 10 steps in any one direction.	Within 4 hours after closing reactor trip breakers if not completed within previous 31 days AND 31 days thereafter

8.1 REACTIVITY CONTROL SYSTEMS

8.1.3 Rod Position Indication System - Shutdown

BASES

BACKGROUND

Instrumentation to monitor variables and systems over their operating ranges during normal operation, anticipated operational occurrences, and accident conditions must be FUNCTIONAL. TR 8.1.3 is required to ensure FUNCTIONALITY of the control rod group demand position indicators to determine control rod positions of rod groups not fully inserted with the Reactor Trip System breakers in the closed position.

The OPERABILITY, including group demand position indication, of the shutdown and control rods are initial assumptions in all safety analyses that assume rod insertion upon reactor trip. Rod position indication is required to assess control and shutdown rod OPERABILITY and misalignment. These safety analyses are not applicable to shutdown conditions. Rod Drop Times and other tests requiring control rod OPERABILITY, however, are performed at shutdown. Additionally, positive reactivity addition due to rod withdrawal must be compensated for by boron addition. Rod positions are monitored and controlled when withdrawn during shutdown conditions to ensure SHUTDOWN MARGIN is maintained. The axial position of shutdown rods and control rods is determined by the group demand position indicators.

The group demand position indicators count the pulses generated in the Rod Control System to provide a readout of the demand bank position. There is one step counter for each group of rods. Individual rods in a group all receive the same signal to move and should, therefore, all be at the same position indicated by the group step counter for that group. The group demand position indicators are considered highly precise (± 1 step or ± 5/8 inch). If a rod does not move 1 step for each demand pulse, the step counter will still count the pulse and incorrectly reflect the position of the rod.

APPLICABLE SAFETY ANALYSES

The Rod Position Indication System is a system which provides information to the operator which could be used to initiate operator action. However, no design basis accident (DBA) or transient assumes operator action to manually trip the reactor, or to take some alternative action if an automatic reactor trip does not occur. Hence, the shutdown and control rods, including position indication, are not assumed to be FUNCTIONAL to mitigate the consequences of a DBA or transient during shutdown conditions. Positive reactivity addition due to withdrawal of control rods is compensated for by boron concentration.

BASES

TECHNICAL REQUIREMENT

TR 8.1.3 specifies that the group demand position indicators be FUNCTIONAL and capable of determining within +/- 12 steps the demand position for each shutdown or control rod not fully inserted. For the control rod position indicators to be FUNCTIONAL requires meeting the verification requirement of the TR. This requirement provides adequate assurance that control rod position indication during shutdown conditions and rod testing is accurate, and that design assumptions are not challenged. FUNCTIONALITY of the required position indicators ensures that nonfuctional, misaligned, or mispositioned control rods can be detected.

APPLICABILITY

TR 8.1.3 covers only the requirements on Rod Position Indication during MODES 3, 4, and 5 with the reactor trip breakers closed. Rod Position Indication during MODES 1 and 2 are covered by Technical Specification 3.1.7. In MODE 6 and in MODES 3, 4, and 5 with trip breakers open or all rods fully inserted, Rod Position Indication is not required to be FUNCTIONAL. Rod Position Indication FUNCTIONALITY is required only when rods are not fully inserted.

CONTINGENCY MEASURES

A.1

With one or more group demand position indicators nonfunctional, FUNCTIONALITY of the affected group demand position indicators must be restored promptly.

The 15 minutes provides an acceptable time to evaluate whether the group demand position indicators represent the actual demand position of the affected rods and whether the affected rods are not fully inserted in an orderly manner without allowing the plant to remain in an acceptable condition for an extended period of time.

B.1 and B.2

If FUNCTIONALITY of the group demand position indicators is not restored within 15 minutes, the unit must be placed in a condition where the demand position indicators are not required. This is accomplished by fully inserting all rods or opening the reactor trip breakers immediately.

The immediate Restoration Times are consistent with the required time for Contingency Measures to be pursued without delay and in a controlled manner.

BASES

TECHNICAL REQUIREMENTS VERIFICATION	TRV 8.1.3.1 Exercising rods at a Frequency of 31 days allows the operator to determine that all withdrawn rods, including the group step counter demand position indicator, continue to be FUNCTIONAL. A movement of 10 steps is adequate to demonstrate motion and verify a corresponding step change in the group step counter demand position indicator. Four hours is provided to perform the first surveillance after closing the reactor trip breakers if the verification has not been performed in the previous 31 days. The 31-day Frequency takes into consideration other information available to the operator in the control room and the remote likelihood that rods would be withdrawn from fully inserted for extended periods of time during shutdown conditions.

8.3 INSTRUMENTATION

8.3.1 Movable Incore Detectors

TECHNICAL REQUIREMENT (TR)

TR 8.3.1 The Movable Incore Detection System shall be FUNCTIONAL with:

a. ≥ 75% of the detector thimbles,

b. ≥ 2 detector thimbles per core quadrant, and

c. Sufficient movable detectors, drive, and readout equipment to map these thimbles.

APPLICABILITY: When the Movable Incore Detection System is used for:

a. Recalibration of the Excore Neutron Flux Detection System,
b. Monitoring the QUADRANT POWER TILT RATIO,
c. Measurement of $F^{N}_{\Delta H}$ and $F_Q(Z)$, or
d. PDMS calibration.

---NOTES---

1. Either a full core flux map or quarter-core flux map may be used in calibrations of the Excore Neutron Flux Detection System.
2. Either a full core flux map or two sets of four thimble locations with quarter core symmetry may be used for monitoring the QUADRANT POWER TILT RATIO.
3. Only ≥ 50% of the detector thimbles and ≥ 2 detector thimbles per core quadrant are required for Power Distribution Monitoring System (PDMS) calibration after the initial PDMS calibration after each refueling.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A Less than the specified number of incore detectors FUNCTIONAL.	A.1 Do not use the Movable Incore Monitoring System for the above applicable monitoring or calibrations. AND	Immediately
	A.2 Evaluate in accordance with TR 7.5.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.3.1.1	Verify the normalization of each required detector output.	24 hours

8.3 INSTRUMENTATION

8.3.1 Movable Incore Detectors

BASES

BACKGROUND

The FUNCTIONALITY of the movable incore detectors with the specified minimum complement of equipment ensures that the measurements obtained from use of this system accurately represent the spatial neutron flux distribution of the reactor core. The FUNCTIONALITY of this system is demonstrated by irradiating each detector used and determining the acceptability of its voltage curve.

For the purpose of measuring $F_Q(Z)$ or $F^N_{\Delta H}$ a full incore flux map or the PDMS is used. Quarter-core flux maps, as defined in WCAP-8648, June 1976, may be used in recalibration of the excore neutron flux detection system, and full incore flux maps or symmetric incore thimbles may be used for monitoring the QUADRANT POWER TILT RATIO when one Power Range Channel is inoperable. See also TR 8.3.6.

8.3 INSTRUMENTATION

8.3.2 Seismic Monitoring Instrumentation

TECHNICAL REQUIREMENT (TR)

TR 8.3.2 The seismic monitoring instrumentation in Table 8.3.2-1 shall be FUNCTIONAL.

APPLICABILITY: At all times.

CONTINGENCY MEASURES

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

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. -----------NOTE------------- Contingency Measure A.4 shall be completed whenever this Condition is entered. -------------------------------- One or more seismic monitoring instrument(s) Nonfunctional due to being actuated during a seismic event.	A.1 Retrieve and analyze data from actuated instrument(s) and 0-XT-52-75B to determine the magnitude of the vibratory ground motion.	4 hours
	<u>AND</u>	
	A.2 Perform plant walkdown of accessible plant areas.	8 hours
	<u>AND</u>	
	A.3 Restore instrument(s) to FUNCTIONAL status.	24 hours
	<u>AND</u>	
	A.4 Perform TRV 8.3.2.3.	10 days
B. 0-XT-52-75B or panel 0-R-113 Nonfunctional for reasons other than Condition A.	B.1 Restore instrument to FUNCTIONAL status.	30 days

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
C. One or more seismic monitoring instrument(s) Nonfunctional for other than Condition A or B.	C.1 Restore instrument to FUNCTIONAL status.	60 days
D. Required Contingency Measures and associated Restoration Time of Condition A, B, or C not met.	D.1 Evaluate in accordance with TR 7.5.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.3.2.1	-----NOTE----- CHANNEL CHECK does not include acceleration trigger. ----- Perform CHANNEL CHECK.	31 days
8.3.2.2	-----NOTE----- CHANNEL FUNCTIONAL TEST does not include setpoint verification. ----- Perform CHANNEL FUNCTIONAL TEST.	184 days
8.3.2.3	-----NOTE----- CHANNEL CALIBRATION includes acceleration trigger. ----- Perform CHANNEL CALIBRATION.	Within 10 days of a seismic actuation <u>AND</u> 18 months

Table 8.3.2-1
Seismic Monitoring Instrumentation
(Page 1 of 1)

INSTRUMENTS AND SENSOR LOCATIONS	MINIMUM INSTRUMENTS FUNCTIONAL	MEASUREMENT RANGE
Triaxial Time History Accelerographs		
1. 0-XT-52-75B, Annulus, Elev. 680**	1*	0 - 1.0g
2. 0-XT-52-75A, Containment, Elev. 734**	1	0 - 1.0g
3. 0-XR-52-77, Diesel Building, Elev. 722	1	0 - 2.0g
4. 0-XR-52-92, Auxiliary Building, Elev. 734	1	0 - 2.0g

* With reactor control room indication.

** With associated acceleration triggers and indication on 0-XR-52-75 and recording and analyzing components on 0-R-113.

8.3 INSTRUMENTATION

8.3.2 Seismic Monitoring Instrumentation

BASES

BACKGROUND

The seismic instrumentation is made up of several instruments such as accelerometers, accelerographs, recorders, etc. These instruments are placed in several appropriate locations throughout the plant in order to provide 1) data on the seismic input to containment, 2) data on the frequency, amplitude and phase relationship of the seismic response of the containment structure, and 3) data on the seismic input to and response of other Seismic Category I structures (Ref 1).

This instrumentation is consistent with the intent of Regulatory Guide 1.12, Revision 1.

The original seismic instrumentation was replaced with state of the art digital instrumentation in order to facilitate application of EPRI OBE (i.e., 1/2 safe shutdown earthquake (SSE) for Sequoyah) Exceedance Criteria, as delineated in References 2 and 5. The replacement instrumentation is capable of recording a seismic event and performing appropriate analyses of the recorded data to provide a timely basis for determining whether a potentially damaging operating basis earthquake (OBE) exceedance has occurred. This information must be evaluated within 4 hours after an event and a walkdown of accessible plant features must be accomplished within 8 hours after an event.

The determination as to whether an 1/2 SSE Exceedance has occurred is made by comparing the calculated spectra for the event with the applicable site design basis spectra, which is defined at top of rock for Sequoyah (Ref. 4). Therefore, the exceedance determination for SQN will be made using uncorrected event data from accelerometer 0-XT-52-75B in the containment annulus. The use of uncorrected event data is known to be conservative because of the inherent response characteristics of the accelerometer. Data from this instrument is recorded at the top of the containment foundation, which is rock-supported. The recorder for this accelerometer is located in panel 0-R-113. As noted above, this accelerometer and recorder are the key components used to detect and record the event in order to make a shutdown decision. The recorder can function for minimum 24 hours from internal rechargeable batteries, which are constantly recharged from 120 VAC Instrument Power. Panel 0-R-113 also contains the computer, LCD display, and printer used to calculate and display the spectral content of the event, and the alarm panel used to annunciate in the control room. These devices are also powered by 120 VAC Instrument Power, but have no backup battery power. Power to these devices may be manually restored in the unlikely event of loss of AC power.

BASES

APPLICABLE SAFETY ANALYSES	The FUNCTIONALITY of the seismic instrumentation ensures that sufficient capability is available to promptly determine the magnitude of a seismic event and to determine the impact on those features important to safety. This capability is required to permit comparison of the measured response to that used in the design basis for the unit to determine if plant equipment inspection is required pursuant to Appendix A of 10 CFR 100 prior to restart. Seismic risks which appear as dominant sequences in probabilistic risk assessment (PRAs) occur for very severe earthquakes with magnitudes which are a factor of two or three above the Safe Shutdown Earthquake and Design Basis Earthquake. The Seismic Instrumentation System was not designed to function or to provide comparative information for such severe earthquakes. This instrumentation is more pertinent to determining the need to shut down following a seismic event and the ability to restart the plant after seismic events which are not risk contributors, and is therefore not of prime importance in risk dominant sequences (Ref. 2).
TECHNICAL REQUIREMENT	The seismic monitoring instrumentation shown in Table 8.3.2-1 shall be FUNCTIONAL. This requirement ensures that an assessment can be made of the effects on the plant of earthquakes which may occur that exceed the design basis spectra for the Operating Basis Earthquake (Ref. 4).
APPLICABILITY	Since the possibility of earthquakes is not MODE dependent, FUNCTIONALITY of the seismic instrumentation is required at all times.
CONTINGENCY MEASURES	The determination as to whether an OBE exceedance has occurred is made by comparing the calculated spectra for the event with the applicable design basis spectra for that building and location. For Sequoyah, this determination is to be made considering the data from instruments located on the containment foundation. Therefore, the exceedance determination for Sequoyah will be made using event data from 0-XT-52-75B in the containment annulus. Data from this instrument is recorded at panel 0-R-113, which also contains the computer used to calculate the spectral content and the alarm panel used to annunciate in the control room. These devices are the key components used to detect the event and make a shutdown determination.

BASES

CONTINGENCY MEASURES (continued)

A.1, A.2, A.3, and A.4

When one or more seismic monitoring instruments actuate during a seismic event with greater than or equal to 0.01g ground acceleration, the data retrieved from the actuated instruments must be analyzed to determine the magnitude of the vibratory ground motion.

The replacement digital instrumentation provides the capability to analyze the event data onsite and generate event spectra to be used in determining whether an 1/2 SSE exceedance has occurred. References 2 and 5 direct that this evaluation should occur within 4 hours after the event. Reference 5 also requires performance of a limited scope walkdown to determine the extent of actual damage within 8 hours following the event. The information provided by this walkdown and the spectral analysis are to be used in making a determination as to whether to proceed with plant shutdown, if a shutdown has not already occurred.

Each actuated monitoring instrument must be restored to FUNCTIONAL status within 24 hours. Within 10 days of the actuation, a CHANNEL CALIBRATION must be performed on each actuated monitoring instrument. The completion time of 10 days to perform CHANNEL CALIBRATION is reasonable and is based on engineering judgment.

Subsequent analysis must then be performed using data from the remaining seismic monitoring instruments to evaluate the plant response in comparison with previously generated design basis spectra at the locations of those instruments.

B.1

With accelerometer 0-XT-52-75B or panel 0-R-113 Nonfunctional, 30 days are allowed to restore the instrument(s) to FUNCTIONAL status.

C.1

With one or more of the remaining seismic instruments in Table 8.3.2-1 Nonfunctional, 60 days are allowed to restore the instrument(s) to FUNCTIONAL status. A longer period of nonfunctionality is allowed for these instruments since they are used only for evaluating plant condition following an event and not for input to the shutdown decision.

BASES

CONTINGENCY MEASURES (continued)

D.1

If Condition A, B or C is not met, then the associated Nonfunctional instrument(s) are evaluated per TR 7.5.3 and condition is entered into the Corrective Action Program.

TECHNICAL REQUIREMENTS VERIFICATION

TRV 8.3.2.1

A CHANNEL CHECK on seismic instrumentation once every 31 days ensues that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is 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 instrument channels could be an indication of excessive instrument drift in one of the channels or of even something more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

The Verification Frequency of 31 days is based on operating experience related to channel FUNCTIONALITY and drift, which demonstrates that failure of more than one channel of a given function in any 31 day interval is a rare event.

TRV 8.3.2.1 is modified by a Note stating that this test does not include the acceleration trigger.

TRV 8.3.2.2

A CHANNEL FUNCTIONAL TEST is to be performed on each required channel to ensure the entire channel will perform the intended function. A CHANNEL FUNCTIONAL TEST is the comparison of the response of the instrumentation, including all components of the instrument except the sensor, to a known signal. The Verification Frequency of 184 days is based upon the known reliability of the monitoring instrumentation and has been shown to be acceptable through operating experience.

TRV 8.3.2.2 is modified by a Note stating that this test does not include setpoint verification.

TECHNICAL REQUIREMENTS VERIFICATION (continued)

TRV 8.3.2.3

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor by comparing the response of the instrument to a known input on the sensor. This test verifies the capability of the seismic instrumentation to correctly determine the magnitude of a seismic event and evaluate the response of those features important to safety. The Verification Frequency of 18 months is based upon operating experience and consistency with the typical industry refueling cycle.

TRV 8.3.2.3 is modified by a Note stating that this test does include the acceleration trigger.

BASES

REFERENCES

1. Regulatory Guide 1.12, "Instrumentation for Earthquakes," Revision 1, April 1974.
2. EPRI NP-5930, July 1988, "A Criterion for Determining Exceedance of the Operating Basis Earthquake."
3. EPRI TR-104239, June 1994, "Seismic Instrumentation in Nuclear Power Plants for Response to OBE Exceedance: Guideline for Implementation."
4. Sequoyah UFSAR, Sections 2.5 and 3.7.1.
5. EPRI NP-6695, December 1989, "Guidelines for Nuclear Plant Response to an Earthquake."
6. 10 CFR 100, Appendix A.

8.3 INSTRUMENTATION

8.3.3 Meteorological Monitoring Instrumentation

TECHNICAL REQUIREMENT (TR)

TR 8.3.3 The meteorological monitoring instrumentation channels for each function shown in Table 8.3.3-1 shall be FUNCTIONAL.

APPLICABILITY: At all times.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. With less than the required FUNCTIONAL meteorological monitoring instrumentation channels available.	A.1 Verify alternate meteorological monitoring data is available to MCR.	Immediately
	<u>AND</u>	
	A.2 Restore channel(s) to FUNCTIONAL status.	48 hours
B. Required Contingency Measures and associated Restoration Time of Condition A not met.	B.1 Evaluate in accordance with TR 7.5.3	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.3.3.1	Perform CHANNEL CHECK for each required channel.	24 hours
8.3.3.2	Perform CHANNEL CALIBRATION for each required channel.	184 days

Table 8.3.3-1
Meteorological Monitoring Instrumentation

FUNCTION		LOCATION (Nominal Elev.)	REQUIRED CHANNELS
1. Wind Speed			
a.	Channel 1	780 MSL	Any two channels of the three Wind Speed Channels
b.	Channel 2	897 MSL	
c.	Channel 3	1047 MSL	
2. Wind Direction			
a.	Channel 1	780 MSL	Any two channels of the three Wind Direction Channels
b.	Channel 2	897 MSL	
c.	Channel 3	1047 MSL	
3. Air Temperature - Delta T			
a.	Channel 1	780 to 897 MSL	Any channel of the three Air Temperature - Delta T Channels
b.	Channel 2	780 to 1047 MSL	
c.	Channel 3	897 to 1047 MSL	

8.3 INSTRUMENTATION

8.3.3 Meteorological Instrumentation

BASES

BACKGROUND	The FUNCTIONALITY of the meteorological monitoring instrumentation channels ensures that sufficient meteorological data is available for estimating potential radiation doses to the public as a result of routine or accidental release of radioactive materials to the atmosphere. This capability is required to evaluate the need for initiating protective measures to protect the health and safety of the public and is consistent with the recommendations of Regulatory Guide 1.23, "Onsite Meteorological Programs" Revision 1, March 2007.

8.3 INSTRUMENTATION

8.3.4 Plant Calorimetric Measurement

TECHNICAL REQUIREMENT (TR)

TR 8.3.4 Leading Edge Flow Meter (LEFM) shall be FUNCTIONAL.

APPLICABILITY: MODE 1 ≥ 50% RTP

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. With the LEFM Nonfunctional.	A.1 Restore LEFM to FUNCTIONAL status.	Prior to next performance of Technical Specification SR 3.3.1.2 with > 98.7% RTP (3411 MWt)
B. Required Contingency Measures and associated Restoration Time of Condition A not met.	B.1 Ensure THERMAL POWER ≤ 98.7% RTP (3411 MWt).	Immediately
	AND	
	B.2 Perform Technical Specification SR 3.3.1.2 using alternate method.	As required by SR 3.3.1.2
	AND	
	B.3 Maintain THERMAL POWER ≤ 98.7% RTP (3411 MWt).	Until LEFM is restored to FUNCTIONAL status and SR 3.3.1.2 is performed using LEFM

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.3.4.1	Verify availability of the LEFM using the self-diagnostics feature indicated by the LEFM Normal/Fail status indication, as displayed on the plant computer system, is not in Fail status.	Prior to the performance of SR 3.3.1.2 using LEFM

8.3 INSTRUMENTATION

8.3.4 Plant Calorimetric Measurement

BASES

BACKGROUND

The predominant contribution to the secondary plant calorimetric measurement uncertainty is the uncertainty associated with the feedwater flow measurement. Traditionally, a differential pressure (ΔP) transmitter across a venturi in each main feedwater line has been used to provide the feedwater flow. However, the venturis are subject to fouling and the uncertainty associated with the flow derived from the ΔP indication can be large and increase as the flow deviates from the "optimum" conditions for which the ΔP transmitter was calibrated.

More recently, Leading Edge Flow Meters (LEFM) have been used to provide the feedwater flow input to the secondary plant calorimetric measurement. The uncertainty associated with the LEFM is relatively small and is independent of the actual feedwater flow.

The RATED THERMAL POWER (RTP) for Units 1 and 2 is 3455 MWt which represents the increase of 1.3% RTP from the originally licensed value of 3411 MWt. This uprate is based on reduced uncertainties associated with the secondary plant calorimetric measurement that is attained through the use of the LEFM Check. Many of the accident analyses are performed at 102% of 3411 MWt, or 3479 MWt, where the 2% RTP is an allowance for the uncertainty associated with the power calorimetric measurement. With the LEFM Check, the power calorimetric measurement uncertainty is less than 0.7% RTP. Without performing new Appendix K accident analyses, the LEFM Check can be used to allow the plant to be operated at a redefined 100% RTP of 3455 MWt.

However, this allowance is predicated on the availability of the LEFM Check for performance of the calorimetric measurement. When the LEFM Check is unavailable, the uncertainties associated with the feedwater venturi-based measurement (2% RTP) must be used to ensure compliance with the safety analyses value of the core power of 3479 MWt.

Surveillance Requirement (SR) 3.3.1.2 requires the performance of a comparison of the results of the calorimetric heat balance calculation to Nuclear Instrumentation System (NIS) channel output. SR 3.3.1.2 requires that the NIS channels be adjusted if the absolute difference is greater than 2% RTP.

BACKGROUND (continued)

SR 3.3.1.2 is required to be performed every 24 hours (daily). At that time, the NIS indication must be normalized to indicate within at least ± 2% RTP of the calorimetric measurement. The plant may then be run for the next 24 hour period using this normalized NIS indication, such that the calorimetric power does not exceed 100% RTP. Although the calorimetric power indication may be monitored continuously for control of the unit power, the calorimetric power indication is not required to be consulted again until the daily calorimetric comparisons of the NIS indication are performed.

The following general guidance is provided for operation of SQN Units 1 and 2:

1) When the LEFM Check is available, the plant should be operated in a manner consistent with the LEFM Check based calorimetric measurement and at 3455 MWt (100% RTP).

2) If the LEFM Check is unavailable, the plant may be operated at 3455 MWt (100% RTP) using the NIS indication until the next performance of SR 3.3.1.2 is due.

3) If the LEFM Check based calorimetric measurement is unavailable at the time SR 3.3.1.2 is due, the feedwater venturi-based calorimetric measurement or other acceptable method should be used for the performance of the SR. However, to maintain consistency with the uncertainty analysis, the maximum allowable power shall be reduced to 3411 MWt or 98.7% RTP. The NIS indication or the normalized feedwater venturi-based calorimetric power indication or RCS delta-T may be used to control the unit power.

APPLICABLE SAFETY ANALYSES

Each of the analyzed accidents are evaluated for the range of power levels over which the reactor is allowed to be operated. Typically, the analyses are most limiting when initiated from a higher power level. For SQN, the majority of the original analyses were performed for a core power of at least 3411 MWt, plus an allowance for the secondary power calorimetric measurement of 2% RTP. In general, these same analyses are used to support the revised RATED THERMAL POWER definition of a core power of 3455 MWt. With the application of a 0.7% RTP uncertainty (based on the use of the LEFM Check feedwater flow and feedwater temperature input into the secondary calorimetric measurement), the analyses are evaluated at a power level of 3479 MWt. Analyses that use statistical methods, such as the analysis of the dropped reactor rod cluster control assembly (RCCA) event, are explicitly evaluated for operation at 3411 MWt with a 2% RTP uncertainty

APPLICABLE SAFETY ANALYSES (continued)

allowance and for operation at 3455 MWt with a 0.7% RTP uncertainty allowance.

The setpoints for those functions of the Reactor Protection System that are based on percentage of power (i.e., the NIS) have been calculated based on analytical margins available at the 3455 MWt definition of 100% RTP. Operation back at 3411 MWt does not require these setpoints to be adjusted.

TECHNICAL REQUIREMENT

The TR requires the LEFM to be FUNCTIONAL for the completion of the daily secondary plant calorimetric measurement required in SR 3.3.1.2. The use of the LEFM Check ensures that the basis for operation at the RATED THERMAL POWER of 3455 MWt is maintained.

APPLICABILITY

The requirement to use the LEFM Check for the performance of the secondary plant calorimetric measurement required by SR 3.3.1.2 is applicable to the unit in Mode 1 and ≥ 50% RTP.

This threshold value is sufficiently high to provide reasonable assurance that LEFM will be functional while low enough to provide early detection of LEFM non-functionality during power ascension.

CONTINGENCY MEASURES

A.1

If the LEFM becomes Nonfunctional during the intervals between performance of SR 3.3.1.2 plant operation may continue using the power indications from the NIS system. However, in order to remain in compliance with the bases for operation at a RATED THERMAL POWER of 3455 MWt, the LEFM must be returned to service prior to performance of SR 3.3.1.2.

B.1

If the Contingency Measure or Restoration Time of Condition A is not met (i.e., the LEFM is not FUNCTIONAL prior to the next performance of SR 3.3.1.2), Condition B is entered. Required Contingency Measure B.1 requires that the reactor power be reduced to, or maintained at, a power level ≤ 98.7% RTP (3411 MWt). This power reduction is performed prior to SR 3.3.1.2 in order to remain within the plant's design bases immediately upon performance of SR 3.3.1.2.

BASES

CONTINGENCY MEASURES (continued)

B.2

Contingency Measure B.2 directs the performance of SR 3.3.1.2 using acceptable alternate methods. At lower power levels this could include the use of RCS delta temperature indications. At higher power levels the feedwater venturi indications for feedwater flow are used to perform the calorimetric comparison. Once SR 3.3.1.2 is performed using the feedwater venturi indications of feedwater flow, the required power uncertainty is 2% RTP. In order to maintain compliance with the safety analyses, it is necessary to operate the plant at a maximum core thermal power of 3411 MWt.

B.3

Contingency Measure B.3 serves as a reminder that the core power be maintained at a value less than or equal to 3411 MWt until the LEFM is returned to service and SR 3.3.1.2 by heat balance comparison, has been performed using the LEFM indication of feedwater flow. Once SR 3.3.1.2 has been performed using the LEFM, then the plant can again be operated at 3455 MWt.

TECHNICAL REQUIREMENTS VERIFICATION

TRV 8.3.4.1 requires that the availability of the LEFM be verified prior to it's use for the performance of SR 3.3.1.2. The self diagnostics features of the LEFM Check is used for this verification along with feedwater temperature indications. If the LEFM Normal/Fail status indication is not in Fail status, it is considered FUNCTIONAL.

REFERENCES

1. License Amendment Request TVA-SQN-TS-01-08, increases the licensed power for operation of SQN Units 1 & 2 to 3455 MWt, Docket No. 50-327/50-328.

8.3 INSTRUMENTATION

8.3.5 Explosive Gas Monitoring System

TECHNICAL REQUIREMENT (TR)

TR 8.3.5 The Explosive Gas Monitoring System with one hydrogen monitor and one oxygen monitor channel shall be FUNCTIONAL with alarm/setpoints set to ensure the concentration limits of TR 8.7.6 are not exceeded.

APPLICABILITY: During waste gas compressor operation.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. One or more explosive gas monitoring channel(s) Nonfunctional.	A.1 Operation of the waste gas disposal system may continued provided grab samples are taken and analyzed.	Every 4 hours during degassing operations of the reactor coolant system AND 24 hours during other operations
	AND	
	A.2 Restore explosive gas monitoring channel(s) to FUNCTIONAL status.	30 days
B. Required Contingency Measures and associated Restoration Time of Condition A not met.	B.1 Prepare and submit a Special Report to the Commission and explain why the Nonfunctionality was not corrected in a timely manner.	In accordance with ODCM Section 5.4.

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.3.5.1	Perform a CHANNEL CHECK on Hydrogen Monitor.	24 hours
8.3.5.2	Perform a CHANNEL CHECK on Oxygen Monitor.	24 hours
8.3.5.3	Perform a CHANNEL FUNCTIONAL TEST on Hydrogen Monitor.	31 days
8.3.5.4	Perform CHANNEL FUNCTIONAL TEST on Oxygen Monitor.	31 days
8.3.5.5	Perform CHANNEL CALIBRATION on Hydrogen Monitor using standard gas samples containing a nominal: a. 1 volume % hydrogen, balance nitrogen; and b. 4 volume % hydrogen, balance nitrogen.	92 days
8.3.5.6	Perform CHANNEL CALIBRATION on Oxygen Monitor using standard gas samples containing a nominal: a. 1 volume % oxygen, balance nitrogen; and b. 4 volume % oxygen, balance nitrogen.	92 days

8.3 INSTRUMENTATION

8.3.5 Explosive Gas Monitoring System

BASES

BACKGROUND	The instrumentation includes provisions for monitoring the concentrations of potentially explosive gas mixtures in the waste gas holdup system. The FUNCTIONALITY and use of this instrumentation is consistent with the requirements for monitoring potentially explosive gas mixtures.

8.3 INSTRUMENTATION

8.3.6 Power Distribution Monitoring System Instrumentation

TECHNICAL REQUIREMENT (TR)

TR 8.3.6 The power distribution monitoring system (PDMS) shall be FUNCTIONAL with valid inputs from the plant computer for each Function specified in Table 8.3.6-1.

APPLICABILITY: MODE 1 > 25% RTP when the PDMS is needed for:

a. Calibration of the Excore Neutron Detector System;
b. Monitoring the QUADRANT POWER TILT RATIO;
c. Measurement of $F_Q(Z)$ and $F^N_{\Delta H}$; or
d. Verifying the position of a rod with inoperable position indicators.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. PDMS Nonfunctional.	A.1 ---------------- NOTE ---------------- TR 7.5.3 is not applicable -- Restore PDMS to FUNCTIONAL status.	Prior to using PDMS

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.3.6.1	Perform a CHANNEL CHECK for each required channel input specified in Table 8.3.6-1.	24 hours

TECHNICAL REQUIREMENTS VERIFICATION (continued)

TRV	VERIFICATION	FREQUENCY
8.3.6.2	Perform a calibration of the PDMS using the movable incore detectors with at least 75% of the detector thimbles and at least 2 detector thimbles per core quadrant with THERMAL POWER greater than 25% RTP.	Once after each refueling prior to using PDMS
8.3.6.3	------------------------------ NOTE -------------------------------- Performance of TRV 8.3.6.2 is credited as the first performance of TRV 8.3.6.3. --- Perform a calibration of the PDMS using the movable incore detectors with at least 50% of the detector thimbles and at least 2 detector thimbles per core quadrant with THERMAL POWER greater than 25% RTP.	180 EFPD <u>AND</u> ----------- NOTE ---------- Not required to be performed until after 31 Effective Full Power Days (EFPD) after the Core Exit Thermocouple (CET) chess knight move pattern not satisfied. ------------------------------- 31 EFPD with less than optimum core exit thermocouple coverage
8.3.6.4	Verify by administrative means that the surveillance requirements for each required channel specified in Table 8.3.6-1 are satisfied.	24 hours

Table 8.3.6-1
Power Distribution Monitoring System Instrumentation

	FUNCTION	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1.	Control Bank Position	4[a]	SR 3.1.7.1
2.	RCS Cold Leg Temperature, T-cold	2[b]	SR 3.3.1.10[e] SR 3.3.3.2[f]
3.	Reactor Power Level	1[c]	SR 3.3.1.2[g] SR 3.3.1.10[h] TRV 8.3.4.1[g]
4.	NIS Power Range Excore Detector Section Signals	6[d]	SR 3.3.1.6 SR 3.3.1.11
5.	Core Exit Thermocouple Temperatures	17 with ≥ 2 per core quadrant	SR 3.3.3.2[i]

(a) Control bank position inputs may be bank positions from either valid Demand position indications or the average of all valid individual RCCA positions in the bank determined from Rod Position Indication System values for each control bank. A maximum of one rod position indicator per group may be inoperable when RCCA position indications are being used as input to the PDMS.

(b) Either Narrow Range or Wide Range RTDs.

(c) Reactor Power Level input may be reactor thermal power derived from either a valid secondary calorimetric measurement (see TR 8.3.4), the average Power Range Neutron Flux Power, or the average RCS Loop ΔT.

(d) The total must consist of three pairs of corresponding upper and lower detector sections.

(e) Applies to Narrow Range RTDs only.

(f) Applies to Wide Range RTDs only.

(g) Not applicable to average RCS Loop ΔT power.

(h) Applies to average RCS Loop ΔT power only.

(i) Applies to Core Exit Thermocouple Temperatures only.

8.3 INSTRUMENTATION

8.3.6 Power Distribution Monitoring System Instrumentation

BASES

BACKGROUND	The power distribution monitoring system (PDMS) is used for periodic measurement of the core power distribution to confirm operation within design limits, and for periodic calibration of the excore neutron detectors. The system does not initiate any automatic protection action. Specifically, the PDMS generates a continuous measurement of the core power distribution and requires information on current plant and core conditions using the core peaking factor and measurement uncertainty methodology described in Reference 1. The core and plant condition information, which includes reactor power level, average reactor vessel inlet temperature, control bank positions, the Power Range Detector calibrated voltage values, and input from the Core Exit Thermocouples, is used as input to the continuous core power distribution measurement software (i.e., BEACON^{TM} Core Monitoring System) that continuously and automatically determines the current core peaking factor values, including the most limiting core peaking factors, $F^N_{\Delta H}$ and $F_Q(Z)$. The measured peaking factor values are provided at nominal one-minute intervals to allow operators to confirm that the core peaking factors are within design limits. The peaking factor limit margins include measurement uncertainty which bounds the actual measurement uncertainty of a FUNCTIONAL PDMS.
APPLICABLE SAFETY ANALYSES	The PDMS provides core monitoring, core measurement reduction, core analysis and core follow, and core predictions. The system provides on-line monitoring of the reactor core using currently installed instrumentation. The PDMS does not initiate any automatic protective action. The PDMS is not credited in any safety analyses.
TECHNICAL REQUIREMENT	Functionality of the PDMS is dependent on the specified number of channel inputs from the plant computer for each Function listed in Table 8.3.6-1. The PDMS is FUNCTIONAL when the required channels are available, when the calibration data set is valid, and when it has been calibrated with an incore flux map within the required frequency. The PDMS must be calibrated above 25% RTP to assure the accuracy of the calibration data set which can be generated from an incore flux map, core exit thermocouples, and the other instrumentation channels. At less than or equal to 25% RTP, the PDMS is Nonfunctional since the calculated power distribution is of reduced accuracy and may not be bounded by the uncertainties documented in Reference 1.

APPLICABILITY

The Technical Requirement Applicability for the PDMS includes its use for performing core power distribution monitoring and related functions required by the Technical Specifications, such as calibration of the Excore Neutron Flux Detection System (SR 3.3.1.3 and SR 3.3.1.6), monitoring the QUADRANT POWER TILT RATIO (SR 3.2.4.2), measurement of $F_Q(Z)$ and $F^N_{\Delta H}$ (SR 3.2.1.1, SR 3.2.1.2, and SR 3.2.2.1), or verifying the position of a rod with inoperable position indicators (Technical Specification 3.1.7 Required Actions A.1, A.2.1, B.3, and C.1). Additionally, the Technical Requirement Applicability is specific to MODE 1 with THERMAL POWER > 25%, as otherwise the calculated power distribution may not be bounded by the uncertainties documented in Reference 1.

CONTINGENCY MEASURES

A.1

The Required Action A.1 has been modified by a Note stating that the provisions of TR 7.5.3 do not apply.

With one or more required channels from one or more Functions specified in Table 8.3.6-1 Nonfunctional or unavailable as input to the PDMS, if THERMAL POWER is less than or equal to 25% RTP, or if the PDMS is Nonfunctional for any other reason, the PDMS must be immediately declared Nonfunctional and shall not be used to perform a core power distribution measurement. Maintaining the minimum number of valid instrumentation channel inputs, in addition to only using the PDMS when the THERMAL POWER is greater than 25% RTP, ensures the PDMS uncertainty is bounded by the uncertainty methodology. Prior to using PDMS for core power distribution monitoring and related Surveillance Requirements in the Technical Specifications, the required channels must be restored to a FUNCTIONAL status.

TECHNICAL REQUIREMENTS VERIFICATION

TRV 8.3.6.1

Performance of a CHANNEL CHECK on the PDMS input instrumentation prior to using the PDMS to obtain a core power distribution measurement ensures that a gross instrumentation failure has not occurred, thus providing added assurance that the required inputs to the PDMS are available.

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 the instrument channels monitoring the same parameter should read approximately the same value. Significant

TECHNICAL REQUIREMENTSVERIFICATION (continued)

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 isolation, 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. If the channels are within the criteria, it is an indication that the channels are FUNCTIONAL.

The Frequency (once per 24 hours) is based on the need to establish that the required inputs to the PDMS are valid prior to using the PDMS to obtain a core power distribution measurement to be used to confirm that the reactor is operating within design limits.

A feature of the PDMS is its capability to automatically check its required inputs and provide a status indication that confirms all required inputs are available and working. The CHANNEL CHECK requirement can thus be satisfied by checking the BEACON System status indicator on the BEACON System PDMS monitor screen prior to use of the PDMS for core power distribution measurement purposes.

<u>TRV 8.3.6.2</u>

The initial calibration of the PDMS uses an accurate incore flux map for PDMS obtained upon exceeding 25% RTP. The initial calibration data set generated for each operating cycle must utilize incore flux measurements from at least 75% of the incore thimbles, with at least two incore thimbles in each core quadrant as required by TR 8.3.1. The incore flux measurements in combination with inputs from the minimum required channels specified in Table 8.3.6-1 are used to generate the updated calibration data set, including the nodal calibration factors and the thermocouple mixing factors.

<u>TRV 8.3.6.3</u>

After completion of the first PDMS calibration following refueling (TRV 8.3.6.2), the calibration data set can be updated using incore flux measurements from at least 50% of the incore thimbles, with at least 2 incore thimbles in each core quadrant. The incore flux measurements in

TECHNICAL REQUIREMENTSVERIFICATION (continued)

combination with inputs from the specified channels in Table 8.3.6-1 (which have been calibrated in accordance with TRV 8.3.6.4) are used to generate the updated calibration data set, including the nodal calibration factors and the thermocouple mixing factors.

The TRV 8.3.6.3 is modified by a Note stating that performance of TRV 8.3.6.2 is credited as the first performance of TRV 8.3.6.3. This is to alert the user a distinct performance of TRV 8.3.6.3 does not have to be performed after a refueling outage and prior to using PDMS, because a successful calibration of the PDMS per TRV 8.3.6.2 inherently satisfies the requirements of TRV 8.3.6.3 and places TRV 8.3.6.3 “in frequency” such that PDMS can be declared functional without a distinct performance of TRV 8.3.6.3. This sets the first performance of TRV 8.3.6.3 from the time TRV 8.3.6.2 is performed.

The PDMS must continue to be periodically calibrated with at least 25% of the installed core exit thermocouples (CETs) available (17 for this unit) and a minimum of two CETs per core quadrant. Optimum CET coverage requires the specified number of CETs and coverage for all interior fuel assemblies (coverage of fuel assemblies with a face along the baffle is not required) within a “chess knight” move radially from an operating and calibrated CET (an adjacent plus a diagonal square away) as specified in Reference 1. The specified Frequency is 180 EFPD when optimum CET coverage is met or 31 EFPD when optimum CET coverage is not available for the PDMS calibration per Reference 2.

The 31 EFPD frequency is modified by a Note that clarifies that subsequent PDMS calibration is not required to be performed until 31 EFPD after the CET chess knight move pattern is not satisfied. The PDMS software automatically analyzes the available thermocouple coverage, consistent with the above criteria, and determines the next surveillance interval for calibration (i.e., 31 EFPD or 180 EFPD). Typically, the required interval is reported in the surveillance report that is generated upon completion of the periodic core power distribution measurement.

<u>TRV 8.3.6.4</u>

TRV 8.3.6.4 may be met by verifying by administrative means the completion of the surveillance requirements required elsewhere. This ensures the instrumentation channels satisfy nominal accuracy and reliability for power operation. Many of these surveillance requirements are CHANNEL CALIBRATIONS.

CHANNEL CALIBRATIONS are typically performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a

TECHNICAL REQUIREMENTSVERIFICATION (continued)

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.

Nine notes modify the instrumentation channels listed in Table 8.3.6-1:

Note (a) allows control bank position to come from either the Demand Position Indication or the average of the individual Rod Position Indications. A maximum of one rod position indication may be inoperable per group.

Note (b) allows RCS Cold Leg Temperature to come from either the Narrow Range or Wide Range RTDs. The two required channels have to be both Narrow Range or both Wide Range, not one channel of each.

Note (c) allows up to three parameters to be used for reactor power input into PDMS, but BEACON will only accept two options at any one time.

Note (d) clarifies that the 6 excore detector section channels must consist of three pairs of upper and lower detector sections.

Note (e) clarifies that the SR 3.3.1.10 requirements specified in this table apply only to the Narrow Range RTDs.

Note (f) clarifies that the SR 3.3.3.2 requirements specified in this table apply only to the Wide Range RTDs.

Note (g) clarifies that the calorimetric heat balance adjustment is not applicable to the average RCS Loop ΔT power input.

Note (h) clarifies that the SR 3.3.1.10 requirements specified in this table apply only to the RCS Loop ΔT power.

Note (i) clarifies that the SR 3.3.3.2 requirements specified in this table apply only to the CET temperatures.

REFERENCES

1. WCAP-12472-P-A, “BEACON Core Monitoring and Operations Support System,” August 1994.

2. Westinghouse letter to NRC LTR-NRC-19-50, “Request to Modify Safety Evaluation Report on WCAP-12472-P-A, ‘BEACON^{TM} Core Monitoring and Operations Support System,’” dated September 9, 2019.

8.4 REACTOR COOLANT SYSTEM (RCS)

8.4.1 Chemistry

TECHNICAL REQUIREMENT (TR)

TR 8.4.1 The RCS chemistry shall be maintained within the limits specified in Table 8.4.1-1.

APPLICABILITY: At all times.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. -------------NOTE----------- Only applicable in MODES 1, 2, 3, and 4. --------------------------------- One or more chemistry parameter(s) in excess of its Steady State Limit but within its Transient Limit.	A.1 Restore the parameter(s) to within its Steady State Limit.	24 hours
B. -------------NOTE----------- Only applicable in MODES 1, 2, 3, and 4. --------------------------------- Required Contingency Measure and associated Restoration Time of Condition A not met. OR One or more chemistry parameter(s) in excess of its Transient Limit.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
C. -------------NOTE----------- Only applicable in MODES 5 and 6. --------------------------------- With the concentration of either chloride or fluoride in the Reactor Coolant System in excess of its Steady State Limit for more than 24 hours or in excess of its Transient Limit.	C.1 Reduce the Pressurizer pressure to ≤ 500 psig, if applicable.	Immediately
	<u>AND</u>	
	C.2 Perform an engineering evaluation to determine the effects of the out-of-limit condition on the structural integrity of the Reactor Coolant System.	Immediately
	<u>AND</u>	
	C.3 Determine that the Reactor Coolant System remains acceptable for continued operation.	Prior to increasing the pressurizer pressure above 500 psig or prior to proceeding to MODE 4.

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.4.1.1	Determine by analysis, the parameters listed in Table 8.4.1-1 are within their specified limits.	72 hours

TABLE 8.4.1-1
REACTOR COOLANT SYSTEM CHEMISTRY LIMITS

PARAMETER	STEADY STATE LIMIT	TRANSIENT LIMIT
Dissolved Oxygen[1]	≤ 0.10 ppm	≤ 1.00 ppm
Chloride	≤ 0.15 ppm	≤ 1.50 ppm
Fluoride	≤ 0.15 ppm	≤ 1.50 ppm

(1) Limit not applicable with $T_{avg} \leq 250°$ F.

8.4 REACTOR COOLANT SYSTEM (RCS)

8.4.1 Chemistry

BASES

BACKGROUND	The limitations on Reactor Coolant System (RCS) chemistry ensure that corrosion of the RCS is minimized and reduces the potential for RCS leakage or failure due to stress corrosion. Maintaining the chemistry within the Steady State Limits provides adequate corrosion protection to ensure the structural integrity of the RCS over the life of the plant. The associated effects of exceeding the oxygen, chloride and fluoride limits are time and temperature dependent. Corrosion studies show that operation may be continued with containment concentration levels in excess of the Steady State Limits, up to the Transient Limits, for the specified limited time intervals without having a significant effect on the structural integrity of the RCS. The time interval permitting continued operation within the restrictions of the Transient Limits provides time for taking corrective actions to restore the containment concentrations to within the Steady State Limits. The verification requirements provide adequate assurance that concentrations in excess of the limits will be detected in sufficient time to take corrective action.

8.4 REACTOR COOLANT SYSTEM (RCS)

8.4.2 Pressurizer Temperature Limits

TECHNICAL REQUIREMENT (TR)

TR 8.4.2 The pressurizer temperature shall be limited to:

a. A maximum heatup of 100°F in any one hour period,

b. A maximum cooldown of 200°F in any one hour period, and

c. A maximum spray water temperature differential of 560°F.

APPLICABILITY: At all times.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. -----------NOTE------------- Contingency Measure A.2 shall be completed whenever this Condition is entered. -------------------------------- Pressurizer temperature limits in excess of any of the above limits.	A.1 Restore the temperature to within limits. AND A.2 Perform an engineering evaluation to determine the effects of the out-of-limit condition on the fracture toughness properties of the pressurizer.	30 minutes Immediately
B. Contingency Measure and associated Restoration Time of Condition A not met. OR Pressurizer not acceptable for continued operation.	B.1 Be in MODE 3. AND B.2 Reduce pressurizer pressure to less than 500 psig.	6 hours 36 hours

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.4.2.1	------------------------------NOTE---------------------------------- Only required to be performed during heatup or cooldown operation. -- Determine pressurizer temperature within limits.	30 minutes
8.4.2.2	Record and evaluate if cyclic limits have been exceeded per Component Cyclic and Transient Limit Program.	Whenever spray operation differential temperature is > 320°F

8.4 REACTOR COOLANT SYSTEM (RCS)

8.4.2 Pressurizer Temperature Limits

BASES

BACKGROUND

The pressurizer is an ASME Section III, vertical vessel with hemispherical top and bottom heads constructed of carbon steel. The vessel is clad with austenitic stainless steel on all surfaces exposed to the reactor coolant. A stainless steel liner or tube may be used in lieu of cladding in some nozzles. The surge line nozzle and removable electric heaters are installed in the bottom head. Spray line nozzles, relief and safety valves are located in the top head of the vessel. A small continuous spray is provided through a manual bypass valve around the power-operated spray valves. The temperature, and hence the pressure are controlled by varying the power input to selected heater elements. The pressurizer is designed to withstand the effects of cyclic loads due to pressure and temperature changes. These loads are introduced by startup and shutdown operations, power transients and reactor trips. During startup and shutdown, the rate of temperature change is controlled by the operator. Heatup rate is controlled by the input to the heater elements, and cooldown is controlled by spray. When the pressurizer is filled with water, i.e., during initial system heatup, and near the end of the second phase of plant cooldown, RCS pressure is maintained by the letdown flow rate via the Residual Heat Removal System.

These Bases address the control of the rate of change of temperature and the effect of the thermal cycling on critical areas of the pressure boundary of the pressurizer. The Reactor Coolant Pressure Boundary, which includes the pressurizer, is defined in 10 CFR 50, section 50.2 (Ref.1). General rules for design and fabrication are provided in 10 CFR 50, section 50.55a (Ref. 2). These design and fabrication rules are based on the ASME Boiler and Pressure Vessel Code.

APPLICABLE SAFETY ANALYSES

The limits on the rate of change of temperature for the heatup and cooldown of the pressurizer and the temperature differential associated with pressurizer spray are not derived from Design Basis Accident analyses (Ref. 3). The limits are prescribed during normal operation to limit the cyclic, thermal loading on critical areas in the pressure boundary. The temperature limits have been established, using approved methodology, to preclude operation in an unanalyzed condition (Ref. 5).

BASES

TECHNICAL REQUIREMENT

TR 8.4.2 specifies the acceptable rates of heatup and cooldown of the pressurizer and a maximum differential temperature allowed across the pressurizer spray nozzle. These limits define allowable operating regions and permit a large number of operating cycles while providing a wide margin to cyclic induced failure in the pressure boundary of the pressurizer.

APPLICABILITY

The pressurizer temperature limits provide a definition of acceptable operation to limit cyclic temperature loading to analyzed conditions. Although these limits were developed to provide rules for operation during heatup and cooldown (MODES 3, 4, and 5), they are applicable at all times.

CONTINGNECY MEASURES

If the rate of change of temperature or temperature differential is outside the limits, the out-of-limit condition must be restored to within limits in 30 minutes. The 30-minute Restoration Time reflects the urgency of restoring the parameters to within the analyzed range. Most violations will not be severe, and the corrective actions can be accomplished in this time in a controlled manner. In addition to restoring operation to within limits, an evaluation is required to determine if operation may continue. This may require event-specific stress analyses or inspections. A favorable evaluation must be completed before continuing operation.

If the pressurizer temperature limits are not restored within 30 minutes, the plant must be placed in a lower MODE and the pressure reduced. This will allow a more careful examination of the event. The 6-hour shutdown time is reasonable, considering operating experience, to reach MODE 3 from full power. The additional 30 hours to reduce the pressure to 500 psig in an orderly manner also considers operating experience. This reduction in pressure is possible without challenging the plant systems or violating any operating limits.

BASES

TECHNICAL REQUIREMENTS VERIFICATION

TRV 8.4.2.1

Verifies that the rate of heatup and the rate of cooldown are within limits. "Step wise" cooling must be avoided as discussed in Reference 4. The 30-minute Frequency is considered reasonable in view of the instrumentation available in the control room to monitor the status of the RCS.

TRV 8.4.2.2

Verifies that any spray operation with a differential temperature greater than 320°F be recorded for evaluation of the cyclic limits in accordance with Component Cyclic and Transient Limit Program. The number of high temperature differential spray actuations must be maintained within the cyclic or transient limits in accordance with Component Cyclic and Transient Limit Program.

REFERENCES

1. 10 CFR 50.2, "Definitions."
2. 10 CFR 50.55a, "Codes and Standards."
3. WCAP-11618, "MERITS Program-Phase II, Task 5, Criteria Application," including Addendum 1 dated April, 1989.
4. Westinghouse letter TVA-90-1130, "Reactor Coolant System Accelerated Cooldown," dated November 5, 1990.
5. Westinghouse Equipment Specification 677234, Revision No. 4, dated January 10 1975.

8.4 REACTOR COOLANT SYSTEM (RCS)

8.4.3 Reactor Coolant System Head Vents (RCSHVs)

TECHNICAL REQUIREMENT (TR)

TR 8.4.3 Two RCSHV paths shall be FUNCTIONAL.

APPLICABILITY: MODES 1, 2, and 3.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. One RCSHV path Nonfunctional.	A.1 Verify Nonfunctional RCSHV path isolated with power removed from the associated RCSHV valve actuators.	1 hour
B. With no RCSHV path FUNCTIONAL.	B.1 Verify RCSHV paths isolated with power removed from the associated RCSHV valve actuators.	1 hour
	<u>AND</u>	
	B.2 Restore at least one RCSHV path to FUNCTIONAL status.	30 days
C. Required Contingency Measures and associated Restoration Time of Condition A or B not met.	C.1 Evaluate in accordance with TR 7.5.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.4.3.1	Verify the upstream manual isolation valves of each RCSHV path are locked in the open position.	18 months
8.4.3.2	Cycle each remotely operated valve in each RCSHV path through at least one complete cycle of full travel from the Control Room.	18 months
8.4.3.3	Verify flow through each RCSHV path.	18 months

8.4 REACTOR COOLANT SYSTEM (RCS)

8.4.3 Reactor Coolant System Head Vents (RCSHVs)

BASES

BACKGROUND	The function of the RCSHVs is to remove non-condensables or steam from the reactor vessel head. This system is designed to mitigate a possible condition of inadequate core cooling, inadequate natural circulation, or inability to depressurize the RHR System initiated conditions resulting from the accumulation of non-condensable gases in the RCS. The RCSHV is designed with redundant safety grade vent paths.

8.6 CONTAINMENT SYSTEM

8.6.1 Combustible Gas Control Hydrogen Monitors

TECHNICAL REQUIREMENT (TR)

TR 8.6.1 Two independent containment hydrogen monitors shall be FUNCTIONAL.

APPLICABILITY: MODES 1 and 2.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. One hydrogen monitor Nonfunctional.	A.1 Restore hydrogen monitor to FUNCTIONAL status.	30 days
B. Both hydrogen monitors Nonfunctional.	B.1 Restore at least one hydrogen monitor to FUNCTIONAL status.	7 days
C. Required Contingency Measures and associated Restoration Time of Condition A or B not met.	C.1 Evaluate in accordance with TR 7.5.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.6.1.1	Perform a CHANNEL CHECK.	12 hours
8.6.1.2	Perform CHANNEL FUNCTIONAL TEST.	31 days
8.6.1.3	Perform CHANNEL CALIBRATION using sample gas containing: a. 1.0 volume % hydrogen, balance nitrogen; and b. 4.0 volume % hydrogen, balance nitrogen.	46 days on a STAGGERED TEST BASIS

8.6 CONTAINMENT SYSTEM

8.6.1 Combustible Gas Control Hydrogen Monitors

BASES

BACKGROUND	The FUNCTIONALITY of the equipment and systems required for the detection of hydrogen gas ensures that this equipment will be available to monitor the hydrogen concentration within containment during significant beyond design-basis accident conditions. The hydrogen monitors of TR 8.6.1 are part of the accident monitoring instrumentation required by 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors," October 16, 2003.

8.6 CONTAINMENT SYSTEM

8.6.2 Ice Bed Temperature Monitoring System

TECHNICAL REQUIREMENT (TR)

TR 8.6.2 Ice bed temperature monitoring system shall be FUNCTIONAL with at least 2 FUNCTIONAL resistance temperature detector (RTD) channels in the ice bed at each of 3 basic elevations (10'6", 30'9", and 55' above the floor of the ice condenser) for each one third of the ice condenser.

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

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES		RESTORATION TIME
A. Main control room ice bed temperature indication Nonfunctional.	A.1	Determine ice bed temperature at local ice condenser monitoring panel.	Once per 12 hours
B. Ice bed temperature monitoring system Nonfunctional and no alternate means of monitoring ice bed temperature.	B.1	Verify ice compartment lower inlet doors are closed.	Immediately
	AND		
	B.2	Verify intermediate deck doors are closed.	Immediately
	AND		
	B.3	Verify top deck doors are closed.	Immediately
	AND		
	B.4	Verify the last recorded mean ice bed temperature was ≤ 20°F and steady.	Immediately
	AND		
	B.5	Restore to FUNCTIONAL status.	6 days

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
C. Required Contingency Measures and associated Restoration Time of Condition A or B not met.	C.1 Evaluate in accordance with TR 7.5.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.6.2.1	Perform CHANNEL CHECK. .	12 hours

8.6 CONTAINMENT SYSTEM

8.6.2 Ice Bed Temperature Monitoring System

BASES

BACKGROUND	The FUNCTIONALITY of the ice bed temperature monitoring system ensures that the capability is available for monitoring the ice temperature. In the event the ice bed temperature monitoring system is Nonfunctional, the Contingency Measures provide assurance that the ice bed heat removal capacity will be retained within the specified time limits.

8.6 CONTAINMENT SYSTEM

8.6.3 Inlet Door Position Monitoring System

TECHNICAL REQUIREMENT (TR)

TR 8.6.3 The inlet door monitoring system shall be FUNCTIONAL.

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

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. Inlet door position monitoring system Nonfunctional.	A.1.1 Verify ice bed temperature monitoring system is FUNCTIONAL.	Immediately
	AND	
	A.1.2 Verify ice bed temperature is ≤ 27˚F.	Once per 4 hours
	AND	
	A.1.3 Restore inlet door monitoring system to FUNCTIONAL status.	14 days
	OR	
	A.2 Restore inlet door monitoring system to FUNCTIONAL status.	48 hours
B. Required Contingency Measures and associated Restoration Time of Condition A not met.	B.1 Evaluate in accordance with TR 7.5.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.6.3.1	Perform CHANNEL CHECK.	12 hours
8.6.3.2	Perform CHANNEL FUNCTIONAL TEST.	18 months
8.6.3.3	-----------------------------NOTE------------------------------------- Channel calibration consists of cycling of the inlet door and verifying position indication reflects door position. --- Perform CHANNEL CALIBRATION.	18 months

8.6 CONTAINMENT SYSTEM

8.6.3 Inlet Door Position Monitoring System

BASES

BACKGROUND

The FUNCTIONALITY of the inlet door position monitoring system ensures that the capability is available for monitoring the individual inlet door position. In the event the monitoring system is Nonfunctional, the Contingency Measures provide assurance that the ice bed heat removal capacity will be retained within the specified time limits.

8.6 CONTAINMENT SYSTEM

8.6.4 Lower Containment Vent Coolers

TECHNICAL REQUIREMENTS (TR)

TR 8.6.4 Two independent trains of lower containment vent coolers shall be FUNCTIONAL with two coolers to each train.

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

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. One required lower containment vent cooler Nonfunctional.	A.1 Restore to FUNCTIONAL status.	7 days
B. Two required lower containment vent coolers in the same train Nonfunctional.	B.1 Restore to FUNCTIONAL status.	72 hours
C. Required Contingency Measures and associated Restoration Time of Condition A or B not met.	C.1 Evaluate in accordance with TR 7.5.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.6.4.1	Verify each lower containment vent cooler fan operates for greater than or equal to 15 minutes.	31 days
8.6.4.2	Verify each lower containment vent cooler fan starts from the control room.	18 months
8.6.4.3	Verify a cooling water flow rate of ≥ 200 gpm to each cooler.	18 months

8.6 CONTAINMENT SYSTEM

8.6.4 Lower Containment Vent Coolers

BASES

BACKGROUND	The FUNCTIONALITY of the lower containment vent coolers ensures that adequate heat removal capacity is available to provide long term cooling following a non-LOCA event. Post accident use of these coolers ensures containment temperatures remain within environmental qualification limits for all safety-related equipment required to remain FUNCTIONAL.

8.7 PLANT SYSTEMS

8.7.1 Steam Generator Pressure/Temperature Limitation

TECHNICAL REQUIREMENT (TR)

TR 8.7.1 The temperature of the primary and secondary coolants in the steam generators shall be > 70°F when the pressure of either coolant in the steam generator is > 200 psig.

APPLICABILITY: At all times.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. -----------NOTE------------- Contingency Measure A.2 and A.3 shall be completed whenever this Condition is entered. --------------------------------	A.1 Reduce the steam generator pressure of the applicable side to ≤ 200 psig.	30 minutes
	<u>AND</u>	
TR not met.	A.2 Determine by engineering evaluation the effects of the overpressurization on the structural integrity of the steam generator.	Prior to increasing steam generator temperatures > 200˚ F
	<u>AND</u>	
	A.3 Determine that the steam generator remains acceptable for continued operation.	Prior to increasing steam generator temperatures > 200˚ F

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.7.1.1	--------------------------------NOTE--------------------------------- Only required to be performed when the temperature of either the primary or secondary coolant is < 70°F. --- Verify pressure of each side of the steam generator is < 200 psig.	1 hour

8.7 PLANT SYSTEMS

8.7.1 Steam Generator Pressure / Temperature Limitation

BASES

BACKGROUND	The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on a steam generator Reference Temperature Nil Ductility Transition (RT_{NDT}) of 25°F and are sufficient to prevent brittle fracture.

8.7 PLANT SYSTEMS

8.7.2 Flood Protection

TECHNICAL REQUIREMENT (TR)

TR 8.7.2 The flood protection plan shall be ready for implementation to maintain the plant in a safe condition and,

no early warning or stage flood warning issued.

APPLICABILITY: At all times.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. Early warning is issued.	--------------------NOTE------------------- Completion of A.2.1 and A.2.2 are not required if communications are verified. ---	
	A.1 Verify communications between Sequoyah Nuclear Plant and TVA River Forecast Center (RFC).	5 hours
	<u>OR</u>	
	A.2.1 Complete Stage I flood protection procedure.	15 hours
	<u>AND</u>	
	A.2.2 Complete Stage II flood protection procedure.	32 hours

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
B. Stage I flood warning issued.	B.1 Be in MODE 3	6 hours
	AND	
	B.2 $T_{avg} \leq 350°F$	10 hours
	AND	
	B.3 Verify SDM is ≥ 5% Δk/k.	10 hours
	AND	
	B.4 Complete Stage I protection procedure.	10 hours
	AND	
	B.5.1 Verify communications between Sequoyah Nuclear Plant and TVA RFC.	10 hours
	OR	
	B.5.2 Complete Stage II flood protection procedure.	27 hours
C. Stage II flood warning issued.	C.1 Initiate Stage II flood protection procedure.	17 hours prior to the predicted arrival time of the initial critical flood level (705 ft Mean Sea Level (MSL) winter and summer).
	AND	
	C.2 Complete Stage II flood protection procedure.	Prior to predicted Stage II flood level.
D. Flood protection plan not ready for implementation.	D.1 Evaluate in accordance with TR 7.5.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.7.2.1	--------------------------------NOTE--------------------------------- Only required to be performed after an early or a stage flood warning has been issued. -- Verify communications between Sequoyah Nuclear Plant and TVA River Forecast Center (RFC).	Every 3 hours

8.7 PLANT SYSTEMS

8.7.2 Flood Protection

BASES

BACKGROUND

The requirements for flood protection ensures that facility protective actions will be taken, and operation will be terminated in the event of flood conditions.

An Early Warning, a Stage I Warning or a Stage II Warning is issued by the TVA River Forecasting Center (RFC) as a result of

(1) a TVA Dam Safety Emergency Condition or critical dam failure.
(2) large seismic event or
(3) major flood-producing rainfall conditions and rain on the ground on the Chickamauga Dam watershed.

An early flood warning is issued by the TVA RFC when the rain on the ground on the Chickamauga Dam watershed reaches 3 inches in 72 hours or less and RFC river modeling projects flood levels at Sequoyah could reach 705.0 feet.

Communication between Sequoyah Operations and the TVA RFC is maintained at least every 3 hours. An early flood warning is also issued by the RFC if a TVA Dam Safety Emergency Condition has been initiated involving a critical dam above Sequoyah or initiated due to major flood-producing rainfall conditions on the Chickamauga Dam watershed, large seismic events or dam safety emergencies.

A Stage I flood warning is issued when 5.6 inches of rainfall on the ground in 72 hours or less is reached (as determined by the TVA RFC) on the Chickamauga Dam watershed and RFC river modeling projects with 27 hours or more advance notice that flood levels at Sequoyah could reach 705.0 feet. A Stage I flood warning is also issued upon the failure of critical upstream dams as defined in the RFC warning procedure and continues through Stage II flood preparation procedures unless the RFC projects flooding will not reach 705.0 feet at Sequoyah.

A Stage II flood warning is issued when 7.6 inches of rainfall on the ground in 72 hours or less is reached (as determined by the TVA RFC) on the Chickamauga Dam watershed and RFC river modeling projects with 17 hours or more advance notice that flood levels at Sequoyah could reach 705.0 feet. A warning target flood level of 705 feet provides sufficient margin to ensure that required preparation activities for plant flood mode operation can be completed without impact due to wind waves.

A Stage I or Stage II flood warning requires the implementation of procedures which include plant shutdown. Further, in the event of a loss of communications simultaneous with a critical flood, or combination of flood and dam failure, the plant will be shutdown and flood protection measures will be implemented.

8.7 PLANT SYSTEMS

8.7.3 Snubbers

TECHNICAL REQUIREMENT (TR)

TR 8.7.3 Each safety related snubber shall be FUNCTIONAL.

APPLICABILITY: MODES 1, 2, 3, and 4,
MODES 5 and 6 for snubbers located on systems or partial systems required OPERABLE/FUNCTIONAL in those MODES.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. One or more required snubber(s) associated with a TRM system Nonfunctional.	A.1.1 Replace or restore Nonfunctional snubber(s) to FUNCTIONAL status.	72 hours
	<u>AND</u>	
	A.1.2 Perform engineering evaluation on the attached component.	72 hours
	<u>OR</u>	
	A.2 Declare the attached system Nonfunctional and enter appropriate TRM Contingency Measure.	Immediately

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
B. One or more required snubber(s) associated with a Technical Specification structure, system, or component Nonfunctional.	B.1 Evaluate entry into Technical Specification LCO 3.0.8.	Immediately
	<u>AND</u>	
	B.2 Evaluate the risk associated with the Nonfunctional snubber and the ability to properly manage the risk.	Immediately
	<u>AND</u>	
	B.3 Evaluate Auxiliary Feedwater OPERABILITY and/or alternative core cooling capability.	Immediately
	<u>AND</u>	
	B.4 Evaluate non-seismic capability associated with the Nonfunctional snubber.	Immediately
	<u>AND</u>	
	B.5.1 Perform an engineering evaluation on the attached component to determine potential system degradation.	72 hours
	<u>OR</u>	
	B.5.2 Declare the affected plant system(s) inoperable.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.7.3.1	Perform snubber inservice inspections in accordance with Appendix 1.	In accordance with Appendix 1

Appendix 1
Augmented Inservice Inspection Program

a. Inspection Groups

The snubbers may be categorized into two major groups based on whether the snubbers are accessible or inaccessible during reactor operation. These major groups may be further subdivided into subgroups based on design, environment, or other features which may be expected to affect the FUNCTIONALITY of the snubbers within the subgroup. Each subgroup may be tested independently in accordance with Appendix 1 (d) through (h).

b. Visual Inspection Schedule and Lot Size

All of the safety-related snubbers shall be included in one population, or they shall be categorized as accessible or inaccessible for visual inspection. If used, the accessible or inaccessible categories shall be considered separately for visual inspections.

When recombining categories into one population, the shorter interval of the categories shall be used.

The visual inspection interval for the population or each category shall be determined based upon the criteria provided in Table 8.7.3-1, and the first inspection interval determined using this criteria shall be based upon the previous inspection interval as established by the requirements in effect before the amendment which incorporated this change was issued by the NRC.

Table 8.7.3-1
SNUBBER VISUAL INSPECTION INTERVAL

	NUMBER OF UNACCEPTABLE SNUBBERS		
Population or Category (Notes 1 and 2)	Column A Extended Interval (Notes 3 and 6)	Column B Repeat Interval (Notes 4 and 6)	Column C Reduce Interval (Notes 5 and 6)
1	0	0	1
80	0	0	2
100	0	1	4
150	0	3	8
200	2	5	13
300	5	12	25
400	8	18	36
500	12	24	48
750	20	40	78
1000 or greater	29	56	109

Note 1: The next visual inspection interval for a snubber population or category size shall be determined based upon the previous inspection interval and the number of unacceptable snubbers found during that interval. Snubbers may be categorized, based upon their accessibility during power operation, as accessible or inaccessible. These categories may be examined separately or jointly. However, the licensee must make and document that decision before any inspection and shall use that decision as the basis upon which to determine the next inspection interval for that category.

Note 2: Interpolation between population or category size and the number of unacceptable snubbers is permissible. Use next lower integer for the value of the limit for Columns A, B, or C if that integer includes a fractional value of unacceptable snubbers as described by interpolation.

Note 3: If the number of unacceptable snubbers is equal to or less than the number in Column A, the next inspection interval may be twice the previous interval but not greater than 48 months.

Note 4: If the number of unacceptable snubbers is equal to or less than the number in Column B but greater than the number in Column A, the next inspection interval shall be the same as the previous interval.

Note 5: If the number of unacceptable snubbers is equal to or greater than the number in Column C, the next inspection interval shall be two-thirds of the previous interval. However, if the number of unacceptable snubbers is less than the number in Column C but greater than the number in Column B, the next interval shall be reduced proportionally by interpolation; that is, the previous interval shall be reduced by a factor that is one-third of the ratio of the difference between the number of unacceptable snubbers found during the previous interval and the number in Column B to the difference in the numbers in Columns B and C.

Note 6: The provisions of Technical Requirement Verification 7.6.2 are applicable for all inspection intervals up to and including 48 months.

c. Visual Inspection Performance and Evaluation

Visual inspections shall verify (1) that there are no visible indications of damage or impaired FUNCTIONALITY, (2) bolts attaching the snubber to the foundation or supporting structure are secure, and (3) snubbers attached to sections of safety-related systems that have experienced unexpected potentially damaging transients since the last inspection period shall be evaluated for the possibility of concealed damage and functionally tested, if applicable, to confirm FUNCTIONALITY.

Snubbers which appear Nonfuntional as a result of visual inspections may be determined FUNCTIONAL for the purpose of establishing the next visual inspection interval, providing that (1) the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers that may be generically susceptible and (2) the affected snubber is functionally tested in the as-found condition and determined FUNCTIONAL per Appendix 1 (e). Hydraulic snubbers with Nonfunctional single or common fluid reservoirs which have uncovered fluid ports shall be declared Nonfunctional.

Also, snubbers which have been made Nonfunctional as the result of unexpected transients, isolated damage, or other such random events, when the provisions of Appendix 1 (g) and (h) have been met and any other appropriate corrective action implemented, shall not be counted in determining the next visual inspection interval.

d. FUNCTIONAL Test Schedule, Lot Size, and Composition

At an interval commensurate with each refueling outage, a representative sample of 10% of the total of the safety-related snubbers in use in the plant shall be functionally tested either in place or in a bench test. The representative sample selected for FUNCTIONAL testing shall include the various configuration, operating environments, and the range of size and capacity of snubbers within the groups or subgroups. The representative sample should be weighted to include more snubbers from severe service areas such as near heavy equipment. Unless a failure analysis as required by Appendix 1 (f) indicates otherwise, the sample shall be a composite based on the ratio of each group to the total number of snubbers installed in the plant. Snubbers placed in the same location as snubbers which failed the previous FUNCTIONAL test shall be included in the next lot if the failure analysis shows that failure was due to location.

The security of fasteners for attachment of the snubbers to the component and to the snubber anchorage shall be verified on snubbers selected for FUNCTIONAL tests.

The provisions of Technical Requirement Verification 7.6.2 are applicable to the interval for performing functional tests. During plant operating MODES 1 through 4 (and MODES 5 and 6 for snubbers located on systems or partial systems required OPERABLE/FUNCTIONAL in the MODES), administrative controls are required for performing snubber functional testing for the purpose of satisfying the functional test interval requirement.

e. Functional Test Acceptance Criteria

The snubber functional test shall verify that:

1. Activation (restraining action) is achieved within the specified range in both tension and compression, except that inertia dependent, acceleration limiting mechanical snubbers, may be tested to verify only that activation takes place in both directions of travel.

2. Snubber bleed, or release where required, is present in both tension and compression within the specified range.

3. The force required to initiate or maintain motion of the snubber is within the specified range in both directions of travel.

4. Testing methods may be used to measure parameters indirectly or parameters other than those specified if those results can be correlated to the specified parameters through established methods.

f. Functional Test Failure Analysis and Additional Test Lots

If any snubber selected for functional testing either fails to lock up or fails to move due to manufacture or design deficiency, all snubbers of the same design subject to the same defect shall be functionally tested. If a snubber does not meet the functional test acceptance criteria, an additional lot equal to one-half the original lot size shall be functionally tested for each failed snubber. An engineering evaluation shall be made of each failure to meet the functional test acceptance criteria to determine the cause of the failure. The result of this analysis shall be used, if applicable, in selecting snubbers to be tested in the subsequent lot in an effort to determine the functionality of other snubbers which may be subject to the same failure mode. (Selection of snubbers for future testing may also be based on the failure analysis.) Testing shall continue until no additional nonfunctional snubber is found within a subsequent required lot or all snubbers of the original inspection group have been tested, or all suspect snubbers identified by the failure analysis have been tested, as applicable.

The discovery of loose or missing attachment fasteners will be evaluated to determine whether the cause may be localized or generic. The result of the evaluation will be used to select other suspect snubbers for verifying the attachment fasteners, as applicable.

Snubbers shall not be subjected to prior maintenance specifically for the purpose of meeting functional test requirements.

g. Functional Test Failure – Attached Component Analysis

For snubber(s) found nonfunctional, an engineering evaluation shall be performed on the components which are restrained by the snubber(s). The purpose of this engineering evaluation shall be to determine if the components restrained by the snubber(s) were adversely affected by the nonfunctionality of the snubber(s) and in order to ensure that the restrained component remains capable of meeting the designed service.

h. Functional Testing of Repaired and Spare Snubbers

Snubbers which fail the visual inspection or the functional test acceptance criteria shall be repaired or replaced. Replacement snubbers and snubbers which have repairs which might affect the functional test results shall be tested to meet the functional test criteria before installation in the unit. These snubbers shall have met the acceptance criteria subsequent to their most recent service, and the functional test must have been performed within 12 months before being installed in the unit.

i. Snubber Service Life Program

The service life of hydraulic and mechanical snubbers shall be monitored to ensure that the service life is not exceeded between verification inspections. The maximum expected service life for the various seals, springs, and other critical parts shall be determined and established based on engineering information and shall be extended or shortened based on monitored test results and failure history. Critical parts shall be replaced so that the maximum service life will not be exceeded during a period when the snubber is required to be FUNCTIONAL. The parts replacements shall be documented, and the documentation shall be retained in accordance with Appendix B, Table 2, of the Nuclear Quality Assurance Plan.

j. Exemption From Visual Inspection or Functional Tests

Permanent or other exemptions from the verification program for individual snubbers may be granted by the Commission if a justifiable basis for exemption is presented and if applicable snubber life destructive testing was performed to qualify snubber functionality for the applicable design conditions at either the completion of their fabrication or at a subsequent date.

8.7 PLANT SYSTEMS

8.7.3 Snubbers

BASES

BACKGROUND

Snubbers are designed to prevent unrestrained pipe or component motion under dynamic loads as might occur during an earthquake or severe transient, while allowing normal thermal motion during startup and shutdown. The consequence of a Nonfunctional snubber is an increase in the probability of structural damage to piping or components as a result of a seismic or other event initiating dynamic loads. It is therefore required that all snubbers protecting the primary coolant system or any other safety system or component be FUNCTIONAL during reactor operation.

Because the snubber protection is required only during relatively low probability events, a period of 72 hours is allowed to replace or restore the Nonfunctional snubber(s) associated with a TRM system to FUNCTIONAL status and perform an engineering evaluation on the supported component or declare the supported system inoperable and follow the appropriate limiting condition for operation statement for that system. The engineering evaluation is performed to determine whether the mode of failure of the snubber has adversely affected any safety-related component or system.

Individual snubbers associated with TRM systems may be removed from service for functional testing during plant operating MODES 1 through 4 (and MODES 5 and 6 for snubbers located on systems or partial systems required FUNCTIONAL in these MODES) provided the following administrative controls are implemented:

- Contingency Measures for Condition A shall be met.
- Snubbers on trained systems or portions of trained systems may be removed only on the scheduled train work week. Snubbers on non-trained systems or portions on non-trained systems may only be removed following a documented risk assessment. Snubbers may not be removed from service for testing on one train of a system while the other train has been declared Nonfunctional for any reason.
- No more than one snubber may be removed from service at a time on any line and attached piping which is analyzed as a seismic subsystem. Multiple snubbers may be removed for testing simultaneously only if separated by a seismic anchor.

8.7.3 Snubbers

BASES

BACKGROUND (continued)

For snubber(s) associated with Technical Specification (TS) required structures, systems, or components (SSC)an evaluation must be performed to determine if the provisions of TS LCO 3.0.8 can be applied. The following table describes the evaluations to be performed:

One or more Nonfunctional snubber(s) *(For snubbers associated with a TS SSC(s))*	Immediately evaluate the following plant conditions to determine the Applicability of TS LCO 3.0.8: 1. The risk associated with the Nonfunctional snubber(s) and the ability to properly manage the risks. 2. Auxiliary feedwater (AFW) OPERABILITY and/or alternative core cooling capability. 3. Non-seismic capability associated with the Nonfunctional snubber(s).
Evaluate risk.	Risk associated with entry into TS LCO 3.0.8 resulting from snubber maintenance activities or an emergent OPERABILITY issue must be assessed and managed. (For MODES 1 through 4): On the affected SSC(s), implement compensatory measures, such as postings, rescheduling maintenance activities, and briefings of plant operators, as appropriate, to enhance the availability of the affected equipment. If the snubber(s) affects only one train of a TS SSC or subsystem, 1. Ensure that at least one train of the AFW system (including a minimum set of supporting equipment required for its successful operation) not associated with the Nonfunctional snubber(s) is OPERABLE. 2. Ensure no maintenance work is planned on the OPERABLE AFW system until TS LCO 3.0.8 is exited.

8.7.3 Snubbers

BASES

BACKGROUND (continued)

Evaluate risk. (continued)	If the snubber(s) affects more than one train of a TS SSC or subsystem, 1. Ensure at least one train of AFW system (including a minimum set of supporting equipment required for its successful operation) not associated with the Nonfunctional snubber(s) is OPERABLE, OR Some alternate means of core cooling such as feed and bleed using the steam generators, fire water system, or aggressive secondary cooldown using the steam generators must be available. 2. Ensure no maintenance work is planned on the OPERABLE AFW system until TS LCO 3.0.8 is exited. (In MODES 5 and 6 for snubbers located on SSC or partial systems required OPERABLE in those MODES): Review the outage schedule and ensure that a diverse means of performing the required safety function is available. For example, if a snubber is rendered Nonfunctional on the normal charging line, the ability to add borated water via the safety injection (SI) system would be a diverse means of performing the required safety function.
Evaluate any non-seismic function(s) performed by the snubber(s).	An evaluation of the non-seismic function(s) (if any) of the Nonfunctional snubber(s) shall be performed immediately. 1. If the analysis concludes that the supported TS SSC is OPERABLE for its non-seismic load function, then TS LCO 3.0.8 may be applied to this Nonfunctional snubber. 2. If the analysis concludes that the supported TS SSC is inoperable for its non-seismic function, then immediately declare the affected SSC inoperable. The provisions of TS LCO 3.0.8 would not apply.

8.7.3 Snubbers

BASES

BACKGROUND (continued)

Evaluate any non-seismic function(s) performed by the snubber(s). (continued)	3. The following shall be documented for the purpose of making them available on a recoverable basis for NRC staff inspection: a. The design function of the Nonfunctional snubber(s) (i.e., seismic vs. non-seismic). b. The implementation of any applicable restrictions (such as one AFW train OPERABLE, etc.). c. The associated plant configuration (such as plant MODE, power level, and any applicable TS Action, etc.).
Perform an engineering evaluation.	Within 72 hours, perform an engineering evaluation on the attached component. The purpose of this engineering evaluation is to determine if the component to which the Nonfunctional snubber(s) is attached has been adversely affected by the mode of failure of the snubber. This is to ensure that the component remains capable of meeting its design function. A snubber removed from service for FUNCTIONAL TRV testing does not require an engineering evaluation.

If the above evaluations determine that TS LCO 3.0.8 is applicable for the Nonfunctional snubber(s) associated with a TS SSC, the provisions of TS LCO 3.0.8 may be applied in lieu of declaring the affected SSC inoperable. If TS LCO 3.0.8 is determined to not be applicable, the affected TS supported SSC LCO must be declared not met.

Safety-related snubbers are visually inspected for overall integrity and FUNCTIONALITY. The inspection will include verification of proper orientation, adequate fluid level is applicable, and attachment of the snubber to its anchorage. The removal of insulation or the verification of torque values for threaded fasteners is not required for visual inspections.

8.7.3 Snubbers

BASES

BACKGROUND (continued)

The inspection frequency is based upon maintaining a constant level of snubber protection. Thus, the required inspection interval varies inversely with the observed snubber failures. The number of Nonfunctional snubbers found during a required inspection determines the time interval for the next required inspection. Inspections performed before that interval has elapsed may be used as a new reference point to determine the next inspection. However, the results of such early inspections performed before the original required time interval has elapsed (nominal time less 25 percent) may not be used to lengthen the required inspection interval. Any inspection whose results require a shorter inspection interval will override the pervious schedule.

When the cause of the rejection of a snubber in a visual inspection is clearly established and remedied for that snubber and for any other snubbers that may be generically susceptible and FUNCTIONALITY verified by inservice functional testing, if applicable, that snubber may be exempted from being counted as Nonfunctional. Generically susceptible snubbers are those which are of a specific make or model and have the same design features directly related to rejection of the snubber, or are similarly located or exposed to the same environmental conditions such as temperature, radiation, and vibration. Test groups may be established based on design features and installed conditions which may be expected to be generic. Each of these groups are tested separately unless an engineering analysis indicates the group is improperly constituted. All suspect snubbers are subject in inspection and testing regardless of test groupings.

To further increase the assurance of snubber reliability, functional tests shall be performed at an interval commensurate with each refueling outage. These tests will include stroking of the snubbers to verify proper movement, activation, and bleed or release. The performance of hydraulic snubbers generally depends on a clean, deaerated fluid contained within variable pressure chambers, flowing at closely controlled rates. Since these characteristics are subject to change with exposure to the reactor environment, time, and other factors, their performance within the specified range should be verified. Mechanical snubbers which depend upon overcoming the inertia of a mass and the braking action of a capstan spring contained within the snubber for limiting the acceleration of the attached component (within the load rating of the snubber) are not subject to changes in performance in the same manner as hydraulic snubbers. Pending the development of information regarding the change during the service of the snubber of the acceleration/resistance relationship and the optimum method for detecting this change, these mechanical snubbers may be tested to verify that when subjected to a large change in velocity the resistance to movement increases greatly.

8.7.3 Snubbers

BASES

BACKGROUND (continued)

The performance change information was developed in order to establish test methods to be used during and after the first refueling outage.

Ten percent of the total population of snubbers is an adequate sample for functional tests. The initial sample is to be proportioned among the groups in order to obtain a representative sample. An observed failure of a snubber in the initial lot will require an engineering analysis and testing of additional snubbers selected from snubbers likely to have the same defect. A thorough inspection of the snubber threaded attachments to the pipe or components and the anchorage will be made in conjunction with all required functional tests.

A list of individual snubbers with detailed information of snubber location and size shall be available at the plant in accordance with Section 50.71(c) of 10 CFR Part 50. The accessibility of each snubber shall be determined based upon the existing radiation levels and the expected time to perform a visual inspection in each snubber location as well as other factors associated with accessibility during plant operations (e.g., temperature, atmosphere, location, etc.), and the recommendations of Regulatory Guide 8.8 and 8.10. The addition or deletion of any hydraulic or mechanical snubber shall be made in accordance with Section 50.59 of 10 CFR Part 50.

8.7 PLANT SYSTEMS

8.7.4 Sealed Source Contamination

TECHNICAL REQUIREMENT (TR)

TR 8.7.4 Each sealed source containing radioactive material > 100 μCi of beta and/or gamma emitting material or > 5 μCi of alpha emitting material, shall be free of ≥ 0.005 μCi of removable contamination.

APPLICABILITY: At all times.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. One or more sealed sources with removable contamination not within limits.	A.1 Withdraw the sealed source from use.	Immediately
	AND	
	A.2.1 Initiate action to decontaminate and repair the sealed source.	Immediately
	OR	
	A.2.2 Initiate action to dispose of the sealed source in accordance with NRC Regulations.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

-----NOTES-----

1. The TRVs shall be performed by Sequoyah personnel or other personnel specifically authorized by the NRC or Agreement State.
2. The test method used shall have a detection sensitivity of ≥ 0.005 μCi per test sample.

TRV	VERIFICATION	FREQUENCY
8.7.4.1	-----NOTE----- Startup sources and fission detectors previously subjected to core flux are excluded. ----- Perform leakage and/or contamination testing on each sealed source in use containing radioactive materials with a half-life > 30 days (excluding Hydrogen 3) and in any form other than gas.	184 days
8.7.4.2	Perform leakage and/or contamination testing for each sealed source and fission detector not in use.	Prior to placing in use or transferring to another licensee, if not performed within the previous 184 days.
8.7.4.3	Perform leakage and/or contamination testing on each sealed source and fission detector not in use that was received without a certificate indicating the last test date.	Prior to placing in use.
8.7.4.4	Perform leakage and/or contamination testing on each sealed startup source and fission detector.	Once within 31 days prior to being subjected to core flux or installed in the core. <u>AND</u> Following repair or maintenance to the sealed source.
8.7.4.5	Submit report to NRC for sealed source or fission detector leakage tests revealing the presence of ≥ 0.005 μCi of removable contamination.	Annually

8.7 PLANT SYSTEMS

8.7.4 Sealed Source Contamination

BASES

BACKGROUND	The limitations on removable contamination for sources requiring leak testing, including alpha emitters, are based on 10 CFR 70.39(c) limits for plutonium. This limitation will ensure that leakage from by-product, source and special nuclear material sources will not exceed allowable intake values. Sealed sources are classified into three groups according to their use, with Technical Requirements Verification commensurate with the probability of damage to a source in that group. Those sources which are frequently handled are required to be tested more often than those which are not. Sealed sources which are continuously enclosed within a shielded mechanism (i.e., sealed sources within radiation monitoring or boron measuring devices) are considered to be stored and need not be tested unless they are removed from the shielded mechanism.

8.7 PLANT SYSTEMS

8.7.5 Heating, Ventilating, and Air Conditioning (HVAC) Maintenance Rule Equipment

TECHNICAL REQUIREMENT (TR)

TR 8.7.5 The HVAC components shown in Table 8.7.5-1 shall be FUNCTIONAL.

APPLICABILITY: As shown in Table 8.7.5-1.

CONTINGENCY MEASURES+

--NOTES--
Separate entry is allowed for each HVAC component.

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. One or more HVAC component(s) in Table 8.7.5-1 Nonfunctional.	A.1 Enter the associated Nonfunctional component in the Operation narrative logs and LCO tracking logs for Maintenance Rule Unavailability tracking.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
None	None	None

Table 8.7.5-1
HVAC Maintenance Rule Equipment

	EQUIPMENT	COMPONENTS	APPLICABLE MODES
1.	1A 480 V Transformer Room Ventilation	1A1-A, 1A2-A, 1A3-A, and 1A4-A exhaust fans	ALL MODES
2.	1B 480 V Transformer Room Ventilation	1B1-B, 1B2-B, and 1B3-B exhaust fans	ALL MODES
3.	2A 480 V Transformer Room Ventilation	2A1-A, 2A2-A, and 2A3-A exhaust fans	ALL MODES
4.	2B 480 V Transformer Room Ventilation	2B1-B, 2B2-B, 2B3-B, and 2B4-B exhaust fans	ALL MODES

8.7 PLANT SYSTEMS

8.7.5 Heating, Ventilating, and Air Conditioning (HVAC) Maintenance Rule Equipment

BASES

BACKGROUND	The HVAC equipment listed in Table 8.7.5-1 is required to be tracked for unavailability by Sequoyah's implementation of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." The Maintenance Rule program requires that the time this equipment is Nonfunctional, be monitored, whether due to an unplanned failure or planned maintenance. The required FUNCTIONALITY of the HVAC equipment is commensurate with the required OPERABILITY of the equipment being cooled. Engineering will trend the unavailability of the equipment as required based on "Risk Significance" of the equipment. The final Maintenance Rule unavailability time will be determined by Engineering. The equipment listed in Table 8.7.5-1 has no Technical Specification LCO or other associated TRM contingency measures for FUNCTIONALITY. Therefore, this TRM was created to provide indication for the unavailability of this HVAC equipment, and to assist in the tracking and trending of the total unavailability time.
APPLICABLE SAFETY ANALYSES	The design basis of this HVAC equipment is to maintain the temperature of the area, to which the associated equipment provides cooling, below the design basis limits as described in the Environmental Design Criteria SQN-DC-V-21.0. This TRM is being implemented for tracking purposes only and there is no associated Safety Analysis affected or implemented by this change.
TECHNICAL REQUIREMENT	This TR is being implemented to track the unavailability time of the associated HVAC equipment. This equipment is considered to be FUNCTIONAL when the individual components necessary to maintain the associated area temperature below the design required limits are FUNCTIONAL. These components include the fan, dampers, and, associated auxiliary equipment as applicable to the various systems.

BASES

APPLICABILITY	Ventilation to the 480 V Transformer Rooms is required for all MODES due to the commonality of the equipment served, and requirements for accident mitigation.
CONTINGNECY MEASURES	With any of the equipment listed in Table 8.7.5-1 Nonfunctional, the corresponding TR for that Unit and Train of equipment shall be entered into the Operation narrative logs and LCO tracking logs for tracking the unavailability time.
TECHNICAL REQUIREMENTS VERIFICATION	This TR is for tracking purposes only. There are no Technical Requirements Verification associated with this TR.
REFERENCES	1. NPG-SPP-03.4, “Maintenance Rule Performance Indicator Monitoring, Trending and Reporting - 10 CFR 50.65.” 2. TI-4, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting - 10 CFR 50.65.” Attachment 7, “Heating, Ventilation and Air Conditioning - System 30.” 3. SQN-DC-V-21.0, “Sequoyah Nuclear Plant - Environmental Design Criteria.”

8.7 PLANT SYSTEMS

8.7.6 Explosive Gas Mixtures

TECHNICAL REQUIREMENT (TR)

TR 8.7.6 The concentration of oxygen in the waste gas holdup system shall be limited to ≤ 2% by volume whenever the hydrogen concentration exceeds 4% by volume.

APPLICABILITY: At all times.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES		RESTORATION TIME
A. Oxygen concentration in a waste gas holdup tank is > 2% by volume and ≤ 4% by volume.	A.1	Reduce oxygen concentration to within limit.	48 hours
B. Oxygen concentration in a waste gas holdup tank is > 4% by volume and hydrogen concentration > 2% by volume.	B.1	Suspend additions of waste gases to the affected waste gas holdup tank.	Immediately
	AND		
	B.2	Reduce the oxygen concentration to ≤ 2% by volume.	Immediately
C. Required Contingency Measures and associated Restoration Time of Condition A or B not met.	C.1	Evaluate in accordance with TR 7.5.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.7.6.1	Verify hydrogen and oxygen concentrations are within limits with the monitors required FUNCTIONAL by TR 8.3.5.	Continuously

8.7 PLANT SYSTEMS

8.7.6 Explosive Gas Mixture

BASES

BACKGROUND	This requirement is provided to ensure that the concentration of potentially explosive gas mixtures contained in the waste gas holdup system is maintained below the flammability limits of hydrogen and oxygen. Maintaining the concentration of hydrogen and oxygen below their flammability limits provides assurance that the releases of radioactive materials will be controlled in conformance with the requirements of General Design Criterion 60 of Appendix A to 10 CFR Part 50.

8.7 PLANT SYSTEMS

8.7.7 Liquid Holdup Tanks

TECHNICAL REQUIREMENT (TR)

TR 8.7.7 The quantity of radioactive material contained in the following tanks shall be limited by the following expression:

$$\sum_i \frac{\text{concentration of isotope } i}{(\text{effluent concentration limit of isotope } i)} \leq 6{,}700$$

excluding tritium and dissolved or entrained noble gases.

a. Condensate Storage Tank

b. Steam Generator Layup Tank

c. Outside temporary tanks for radioactive liquid.

APPLICABILITY: At all times.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. The quantity of radioactive material exceeding the above limit.	A.1 Suspend additions of radioactive material to the tank.	Immediately
	AND	
	A.2 Reduce tank contents to within limits.	48 hours

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.7.7.1	Verify the quantity of radioactive material contained in each tank is within the limit by analyzing a representative sample of the tank's contents.	Every 7 days when radioactive materials are being added to the tank.

8.7 PLANT SYSTEMS

8.7.7 Liquid Holdup Tanks

BASES

BACKGROUND	Restricting the quantity of radioactive material contained in the specified tanks provides assurance that in the event of an uncontrolled release of the tanks' contents, the resulting concentrations would be less than the limits of 10 CFR Part 20.1001-20.2401, Appendix B, Table 2, Column 2, at the nearest potable water supply and the nearest surface water supply in an unrestricted area.

8.7 PLANT SYSTEMS

8.7.8 Gas Decay Tanks

TECHNICAL REQUIREMENT (TR)

TR 8.7.8 The quantity of radioactivity contained in each gas decay tank shall be ≤ 50,000 curies noble gases (considered as Xe-133).

APPLICABILITY: At all times.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. Quantity of radioactive material contained in tank not within limits.	A.1 Suspend additions of radioactive material to the tank.	Immediately
	AND	
	A.2 Reduce tank contents within limits.	48 hours
B. Required Contingency Measures and associated Restoration Time of Condition A not met.	B.1 Evaluate in accordance with TR 7.5.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.7.8.1	Verify the quantity of radioactive material contained in each gas decay tank is within the limit.	Every 24 hours when radioactive materials are being added to the tank.

8.7 PLANT SYSTEMS

8.7.8 Gas Decay Tanks

BASES

BACKGROUND	Restricting the quantity of radioactivity contained in each gas decay tank provides assurance that in the event of an uncontrolled release of the tank's contents, the resulting total body exposure to an individual at the nearest exclusion area boundary will not exceed 0.5 rem. This is consistent with Standard Review Plan 15.7.1, "Waste Gas System Failure."

8.7 PLANT SYSTEMS

8.7.9 Ventilation Filter Testing

TECHNICAL REQUIREMENT (TR)

TR 8.7.9 Engineered Safety Feature (ESF) charcoal adsorber(s) shall be within limits per Technical Specification 5.5.9.

APPLICABILITY: Whenever the charcoal adsorber(s) is required to be OPERABLE.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. TRV 8.7.9.1 is not met.	A.1 Evaluate per Technical Specification 5.5.9.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.7.9.1	Verify by laboratory analysis carbon sample is within limit.	Once within 31 days after removal of carbon sample.

8.7 PLANT SYSTEMS

8.7.9 Ventilation Filter Testing

BASES

BACKGROUND	None

8.8 ELECTRICAL POWER SYSTEMS

8.8.1 Containment Penetration Conductor Overcurrent Protective Devices

TECHNICAL REQUIREMENT (TR)

TR 8.8.1 Primary and backup containment penetration conductor overcurrent protective devices associated with each containment electrical penetration circuit for those circuits that exceed their credible fault currents design rating shall be FUNCTIONAL.

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

CONTINGENCY MEASURES

-----NOTE-----
Separate Condition entry is allowed for each containment penetration conductor overcurrent protective device.

CONDITION	CONTINGENCY MEASURES		RESTORATION TIME
A. One or more required containment penetration conductor overcurrent protective devices Nonfunctional.	A.1	Evaluate in accordance with TR 7.5.3.	Immediately
	AND		
	A.2	Isolate circuit(s) by de-energizing the primary or backup isolation device.	72 hours
	AND		
	A.3	Verify circuit is de-energized by breaker opened or fuses removed where applicable.	Once per 7 days

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.8.1.1	-----------------------------NOTE----------------------------------- For at least one 6.9 kV reactor coolant pump circuit, such that all reactor coolant pump circuits are demonstrated FUNCTIONAL at least once per 72 months. -- Perform CHANNEL CALIBRATION on at least one reactor coolant pump associated protective relays specified in appropriate plant instructions.	18 months
8.8.1.2	-----------------------------NOTE----------------------------------- For at least one 6.9 kV reactor coolant pump circuit, such that all reactor coolant pump circuits are demonstrated FUNCTIONAL at least once per 72 months. For each circuit breaker found Nonfunctional during the test, an additional representative sample of at least 1 of the circuit breakers of the Nonfunctional type shall also be functionally tested until no more failures are found or all circuit breakers of that type have been functionally tested. -- Perform integrated system functional test on at least one reactor coolant pump which includes simulated automatic actuation of the system and verifying that each relay and associated circuit breakers and control circuits function as designed.	18 months

TRV	VERIFICATION	FREQUENCY
8.8.1.3	-----------------------------NOTE------------------------------------ Testing shall consist of injecting a current input at the specified setpoint to each selected circuit breaker and verifying that each circuit breaker functions as designed. Circuit breakers found Nonfunctional during functional testing shall be restored to FUNCTIONAL status prior to resuming operation. --- Perform functional test of each low voltage circuit breaker in accordance with procedures prepared in conjunction with manufacturer's recommendations.	In accordance with 0-TI-SBR-000-001.0
8.8.1.4	Deleted	

TRV	VERIFICATION	FREQUENCY
8.8.1.5	Perform an inspection and preventive maintenance on each non-molded case circuit breaker in accordance with procedures prepared in conjunction with manufacturer's recommendations.	In accordance with 0-TI-SBR-000-001.0
8.8.1.6	Perform an inspection and preventive maintenance on each molded case circuit breaker in accordance with procedures prepared in conjunction with manufacturer's recommendations.	In accordance with 0-TI-SBR-000-001.0

8.8 ELECTRICAL POWER SYSTEMS

8.8.1 Containment Penetration Conductor Overcurrent Protective Devices

BASES

BACKGROUND	Containment electrical penetrations and penetration conductors are protected by either de-energizing circuits not required during reactor operation or by demonstrating the FUNCTIONALITY of primary and backup overcurrent protection circuit breakers during periodic performance of Technical Requirements Verification (TRV). The TRVs applicable to lower voltage circuit breakers and fuses provide assurance of breaker and fuse reliability by testing circuit breakers and inspecting fuses. Each molded case and non-molded case circuit breaker will be tested at a frequency established by considering applicable maintenance history as well as manufacturer and industry guidelines. Inspection of fuses and their holders will be performed in accordance with TVA's fuse control procedure each time fuses are manipulated to ensure: (1) that the proper size fuse is installed, (2) that the fuse shows no sign of deteriorations, (3) that the fuse connections are tight and clean (See IEEE Std 242-1975, Recommended Practice for Protection and coordination of Industrial and Commercial Power Systems). Should a problem be identified during inspection or should a problem arise with a specific brand or model of fuse, necessary corrective actions should be initiated through the plant's Corrective Action Program.
TECHNICAL REQUIREMENT	The Primary and backup containment penetration conductor overcurrent protective devices excludes those circuits for which credible fault current would not exceed the electrical penetration design rating.

8.8 ELECTRICAL POWER SYSTEMS

8.8.2 Motor Operated Valves Thermal Overload Protection

TECHNICAL REQUIREMENT (TR)

TR 8.8.2 The thermal overload protection devices, integral with the motor starter, of each valve used in safety systems shall be FUNCTIONAL.

APPLICABILITY: Whenever the motor operated valve is required to be OPERABLE.

CONTINGENCY MEASURES

--NOTE--
Separate Condition entry is allowed for each thermal overload protection device.

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. One or more required thermal overload protection device(s) Nonfunctional.	A.1 Document the condition(s) in the Corrective Action Program.	Immediately
	AND	
	A.2 Evaluate affected motor operated valve(s) for OPERABILITY.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.8.2.1	Perform CHANNEL CALIBRATION of a representative sample of at least 25% of all thermal overload devices which are not bypassed, such that each non-bypassed device is calibrated at least once per 6 years.	18 months
8.8.2.2	Perform CHANNEL FUNCTIONAL TEST of the bypass circuitry for those thermal overload devices which are normally in force during plant operation and bypassed under accident conditions.	18 months

8.8 ELECTRICAL POWER SYSTEMS

8.8.2 Motor Operated Valves Thermal Overload Protection

BASES

BACKGROUND	The FUNCTIONALITY of the motor operated valves thermal overload protection devices ensures that the thermal overload protection devices will not prevent safety related valves from performing their function. The Technical Requirements Verification for demonstrating the FUNCTIONALITY of these devices are in accordance with Regulatory Guide 1.106 "Thermal Overload Protection for Electrical Motors on Motor Operated Valves," Revision 1, March 1977.

8.8 ELECTRICAL POWER SYSTEMS

8.8.3 Isolation Devices

TECHNICAL REQUIREMENT (TR)

TR 8.8.3 All circuit breakers actuated by fault currents that are used as isolation devices protecting IE busses from non qualified loads shall be FUNCTIONAL.

APPLICABILITY: MODE 1, 2, 3 and 4.

CONTINGENCY MEASURES

--NOTE--
Separate Condition entry is allowed for each circuit breaker.

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. One or more required circuit breaker(s) Nonfunctional.	A.1 --------------NOTE--------------- Molded cased breakers do not have a rack-out function. ------------------------------------- Trip and rack-out Nonfunctional circuit breaker(s).	8 hours
	<u>AND</u>	
	A.2 Verify Nonfunctional circuit breaker(s) is tripped.	Once per 7 days
B. Required Contingency Measures and associated Restoration Time of Condition A not met.	B.1 Evaluate in accordance with TR 7.5.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.8.3.1	---------------------------NOTES--------------------------------- 1. Functional testing shall consists of injecting a current input at the specified setpoint to each selected circuit breaker or relay and verifying it functions as designed. --- Perform functional test of each low voltage circuit breaker in accordance with procedures prepared in conjunction with manufacturer’s recommendations.	In accordance with 0-TI-SBR-000-001.0
8.8.3.2	Perform inspection and preventive maintenance on each non-molded case circuit breaker in accordance with procedures prepared in conjunction with manufacturer's recommendations.	In accordance with 0-TI-SBR-000-001.0
8.8.3.3	Perform inspection and preventive maintenance on each molded case circuit breaker in accordance with procedures prepared in conjunction with manufacturer's recommendations.	In accordance with 0-TI-SBR-000-001.0

8.8 ELECTRICAL POWER SYSTEMS

8.8.3 Isolation Devices

BASES

BACKGROUND

Circuit breakers actuated by faulted currents are used as isolation devices in this plant. The FUNCTIONALITY of these circuit breakers ensures that the IE busses will be protected in the event of faults in nonqualified loads powered by the busses.

The testing requirements applicable to lower voltage circuit breakers provides assurance of breaker reliability by testing circuit breakers. Each molded case and non-molded case circuit breaker will be tested at a frequency established by considering applicable maintenance history as well as manufacturer and industry guidelines.

8.8 ELECTRICAL POWER SYSTEMS

8.8.4 Emergency Diesel Generator (EDG) Fuel Oil Storage Tanks

TECHNICAL REQUIREMENT (TR)

TR 8.8.4 The Emergency Diesel Generator Fuel Oil Storage Tanks shall be FUNCTIONAL.

APPLICABILITY: When associated EDG is required to be OPERABLE.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. TRV 8.8.4.1 not met.	A.1 Evaluate in accordance with TR 7.5.3.	Immediately
	AND	
	A.2 Evaluate EDG(s) for OPERABILITY requirements of Technical Specification 3.8.3.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.8.4.1	For each emergency diesel generator fuel oil storage tank perform the following: a. Drain fuel oil, b. Remove accumulated sediment, and c. Clean the tank.	10 years

8.8 ELECTRICAL POWER SYSTEMS

8.8.4 Emergency Diesel Generator Fuel Oil Storage Tanks

BASES

BACKGROUND	A description of the diesel generator fuel oil 7-day storage tank is provided in the Bases for Technical Specification (TS) LCO 3.8.3, "Diesel Fuel Oil, Lube Oil, and Starting Air."
APPLICABLE SAFETY ANALYSES	The Applicable Safety Analyses section for the Bases of TS LCO 3.8.3 also applies to this TR.
TECHNICAL REQUIREMENT	TR 8.8.4 specifies preventive maintenance to ensure proper quality of the fuel oil.
APPLICABILITY	TR 8.8.4 is consistent with TS LCO 3.8.3.
CONTINGENCY MEASURES	A.1 This Contingency Measure is entered to evaluate a failure to perform tank cleaning. A.2 Failure to perform tank cleaning could challenge the assurance of adequate fuel oil quality for proper operation of the diesel generators.
TECHNICAL REQUIREMENTS VERIFICATION	TRV 8.8.4.1 Draining of the fuel oil stored in the supply tanks (i.e., 7-Day Tanks), removal of accumulated sediment, and tank cleaning are required at 10-year intervals by Regulatory Guide 1.137 (Reference 2), paragraph 2.f. This TRV is for preventive maintenance. The presence of sediment does not necessarily represent a failure of this TRV, provided that accumulated sediment is removed during the performance of the verification.

BASES

REFERENCES

1. UFSAR, Section 9.5.4

2. Regulatory Guide 1.137 Fuel-Oil Systems for Standby Diesel Generators, Revision 1, October 1979.

8.9 REFUELING OPERATIONS

8.9.1 Communications

TECHNICAL REQUIREMENT (TR)

TR 8.9.1 Direct communications shall be maintained between the control room and personnel at the refueling station.

APPLICABILITY: During CORE ALTERATIONS.

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES	RESTORATION TIME
A. Direct communications between the control room and personnel at the refueling station not maintained.	A.1 Suspend CORE ALTERATIONS.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.9.1.1	Verify direct communications between the control room and personnel at the refueling station.	Within 1 hour prior to the start of CORE ALTERATIONS <u>AND</u> Once per 12 hours thereafter

8.9 REFUELING OPERATIONS

8.9.1 Communications

BASES

BACKGROUND	The requirements for communications capability ensures that refueling station personnel can be promptly informed of significant changes in the facility status or core reactivity conditions during CORE ALTERATIONS.

8.9 REFUELING OPERATIONS

8.9.2 Manipulator Crane

TECHNICAL REQUIREMENT (TR)

TR 8.9.2 The manipulator crane and auxiliary hoist shall be used for movement of drive rods or fuel assemblies and shall be FUNCTIONAL with:

a. The manipulator crane used for movement of fuel assemblies having:

   1. A capacity of ≥ 2750 pounds; and

   2. An overload cut off limit of ≤ 2700 pounds.

b. The auxiliary hoist used for latching and unlatching drive rods having:

   1. A capacity of ≥ 760 pounds; and

   2. A load indicator which shall be used to prevent lifting loads > 750 pounds.

APPLICABILITY: During movement of drive rods or fuel assemblies within the reactor pressure vessel.

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

CONTINGENCY MEASURES

CONDITION	CONTINGENCY MEASURES		RESTORATION TIME
A. One manipulator crane and/or auxiliary hoist Nonfunctional.	A.1	Suspend use of NONFUNCTIONAL crane and/or hoist from operations involving the movement of drive rods and fuel assemblies within the reactor pressure vessel.	Immediately

TECHNICAL REQUIREMENTS VERIFICATION

TRV	VERIFICATION	FREQUENCY
8.9.2.1	For each manipulator crane used for movement of fuel assemblies within the reactor pressure vessel, perform a load test of ≥ 2750 pounds and verify an automatic overload cutoff when the crane load exceeds 2700 pounds.	Once within 100 hours prior to start of movement of fuel assemblies within the reactor pressure vessel
8.9.2.2	For each auxiliary hoist and associated load indicator used for movement of drive rods within the reactor pressure vessel, perform a hoist load test of ≥ 760 pounds.	Once within 100 hours prior to start of movement of drive rods within the reactor pressure vessel

8.9 REFUELING OPERATIONS

8.9.2 Manipulator Crane

BASES

BACKGROUND	The FUNCTIONALITY requirements for the manipulator cranes ensure that: 1) manipulator cranes will be used for movement of drive rods and fuel assemblies, 2) each crane has sufficient load capacity to lift a drive rod or fuel assembly, and 3) the core internals and pressure vessel are protected from excessive lifting force in the event they are inadvertently engaged during lifting operations.