Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37384-2000

April 5, 2001

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

Gentlemen:

In the Matter of	)	Docket Nos. 50-327
Tennessee Valley Authority	)	50-328

SEQUOYAH NUCLEAR PLANT - REVISION TO THE TECHNICAL REQUIREMENTS MANUAL (TRM) (REVISIONS 8, 9, 10, 11, 12, AND 13)

The purpose of this letter is to inform NRC of changes that we have incorporated into the TRM. Specifically, TRM Revision 8 added the requirements for electrical equipment protective devices. This revision was performed in conjunction with Sequoyah Technical Specifications Amendments 250 and 241 for Units 1 and 2, respectively, and provided for the relocation of these requirements to the TRM.

Revision 9 of the TRM added a more conservative requirement for the reactor coolant system specific activity average limit. This addition was utilized as a compensatory measure for analysis inaccuracies, resulting in the associated Technical Specifications requirements that provide adequate margin for this safety function being suspect. This TRM addition is to be removed after the analysis for specific activity is updated to correct the analysis inaccuracies.

Revision 10 of the TRM added a new requirement for the control room air temperature control system. This revision is a compensatory measure to provide operability criteria for this system until a Technical Specifications change can be processed to include a similar specification in the Sequoyah Technical Specifications.

D030

Revision 11 removed the requirements for radiation monitoring instrumentation and control room emergency ventilation. These requirements were previously added to compensate for Technical Specifications inadequacies associated with the radiation monitors that actuate control room isolation. The associated Technical Specifications requirements have been revised by NRC approved Amendments 256 and 247 for Units 1 and 2, respectively, to provide the appropriate requirements and allow the removal of these TRM requirements.

Revision 12 added a new requirement for the maintenance rule risk significant heating, ventilation, and air conditioning equipment. This requirement provides a process to ensure that the unavailability of this equipment is entered in operation logs to enhance the tracking of equipment unavailability.

Revision 13 adds new TRM sections for the boration control systems and the rod position indication system during shutdown. These additions are the result of the NRC approved relocation of these requirements from the Technical Specifications in Amendments 264 and 255 for Units 1 and 2, respectively.

The enclosure provides the revised TRM pages affected by these revisions.

Please direct questions concerning this issue to me at (423) 843-7170 or J. D. Smith at (423) 843-6672.

Sincerely,

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ENCLOSURE

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REVISION TO THE TECHNICAL REQUIREMENTS MANUAL (TRM)
(REVISIONS 8, 9, 10, 11, 12, AND 13)

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Revision 8

Addition of Electrical Equipment Protective Devices

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TR 3/4.8.1 No current requirement

TR 3/4.8.2 No current requirement

ELECTRICAL POWER SYSTEMS

TR 3/4.8.3 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

CONTAINMENT PENETRATION CONDUCTOR OVERCURRENT PROTECTIVE DEVICES

LIMITING CONDITION FOR OPERATION

TR 3.8.3.1 Primary and Backup containment penetration conductor overcurrent protective devices associated with each containment electrical penetration circuit shall be OPERABLE. The scope of these protective devices excludes those circuits for which credible fault currents would not exceed the electrical penetration design rating.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one or more of the containment penetration conductor overcurrent protective devices:

a. Restore the protective device(s) to OPERABLE status or de-energize the circuit(s) by tripping the associated backup circuit breaker within 72 hours and verify the backup circuit breaker to be tripped at least once per 7 days thereafter; the provisions of Technical Requirement 3.0.4 are not applicable to overcurrent devices in circuits which have their backup circuit breakers tripped, or

b. Be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

TR 4.8.3.1 All containment penetration conductor overcurrent protective devices shall be demonstrated OPERABLE:

a. At least once per 18 months:

1. For at least one 6.9 kV reactor coolant pump circuit, such that all reactor coolant pump circuits are demonstrated OPERABLE at least once per 72 months, by performance of:

(a) A CHANNEL CALIBRATION of the associated protective relays specified in appropriate plant instructions, and

(b) An integrated system functional test which includes simulated automatic actuation of the system and verifying that each relay and associated circuit breakers and control circuits function as designed.

SURVEILLANCE REQUIREMENTS (Continued)

(c) For each circuit breaker found inoperable during these functional tests, an additional representative sample of at least 1 of the circuit breakers of the inoperable type shall also be functionally tested until no more failures are found or all circuit breakers of that type have been functionally tested.

2. By selecting and functionally testing a representative sample of at least 10% of each type of lower voltage circuit breakers. Circuit breakers selected for functional testing shall be selected on a rotating basis. The functional test 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 inoperable during functional testing shall be restored to OPERABLE status prior to resuming operation. For each circuit breaker found inoperable during these functional tests an additional representative sample of at least 10% of all the circuit breakers of the inoperable type shall also be functionally tested until no more failures are found or all circuit breakers of that type have been functionally tested.

3. By selecting and verifying a representative sample of each type of fuse on a rotating basis. Verification will be accomplished as described by TR 4.8.3.1.a.3.a. Each representative sample of fuses shall include at least 10% of all fuses of that type. Fuses found inoperable during verification shall be replaced with OPERABLE fuses prior to resuming operation. For each fuse found inoperable during verification, an additional representative sample of at least 10% of all fuses of that type shall be functionally tested until no more failures are found or all fuses of that type have been functionally tested.

(a) A fuse verification and maintenance program will be maintained to ensure that:

1. The proper size and type of fuse is installed,

2. The fuse shows no sign of deterioration, and

3. The fuse connections are tight and clean.

b. At least once per 60 months by subjecting each circuit breaker to an inspection and preventive maintenance in accordance with procedures prepared in conjunction with manufacturer's recommendations.

ELECTRICAL POWER SYSTEMS

MOTOR OPERATED VALVES THERMAL OVERLOAD PROTECTION

LIMITING CONDITION FOR OPERATION

TR 3.8.3.2 The thermal overload protection devices, integral with the motor starter, of each valve used in safety systems shall be OPERABLE.

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

ACTION:

With one or more of the thermal overload protection devices inoperable, declare the affected valve(s) inoperable and apply the ACTION Statement to the affected valve(s).

SURVEILLANCE REQUIREMENTS

TR 4.8.3.2 The above required thermal overload protection devices shall be demonstrated OPERABLE:

a. At least once per 18 months by the performance of a 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.

b. At least once per 18 months, by the performance of a 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.

ELECTRICAL POWER SYSTEMS

ISOLATION DEVICES

LIMITING CONDITION FOR OPERATION

TR 3.8.3.3 All circuit breakers actuated by fault currents that are used as isolation devices protecting IE busses from non qualified loads shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one or more of the above required circuit breakers inoperable either:

a. Restore the inoperable circuit breaker(s) to OPERABLE status within 8 hours, or

b. Trip the inoperable circuit breaker(s), rack-out the circuit breaker(s) within 8 hours and verify the circuit breaker(s) to be racked out at least once per 7 days thereafter; the provisions of Technical Requirement 3.0.4 are not applicable to racked-out circuit breakers, or

c. Be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

TR 4.8.3.3 Each of the above required circuit breakers shall be demonstrated OPERABLE:

a. At least once per 18 months by selecting and functionally testing a representative sample of at least 10% of each type of circuit breaker. Circuit breakers selected for functional testing shall be selected on a rotating basis. The functional test shall consist of injecting a current input at the specified setpoint to each selected circuit breaker or relay and verifying that each circuit breaker functions as designed. For each device found inoperable during these functional tests, an additional representative sample of at least 10% of each over current protection device of the inoperable type shall also be functionally tested until no more failures are found or all devices of that type have been functionally tested.

b. At least once per 60 months by subjecting each circuit breaker to an inspection and preventive maintenance in accordance with procedures prepared in conjunction with its manufacturer's recommendations.

TRB 3/4.8 ELECTRICAL POWER SYSTEMS

BASES

TRB 3/4.8.1 No current discussions

TRB 3/4.8.2 No current discussions

TRB 3/4.8.3 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

Containment electrical penetrations and penetration conductors are protected by either de-energizing circuits not required during reactor operation or by demonstrating the OPERABILITY of primary and backup overcurrent protection circuit breakers during periodic surveillance.

The surveillance requirements applicable to lower voltage circuit breakers and fuses provides assurance of breaker and fuse reliability by testing at least one representative sample of each manufacturers brand of circuit breakers and/or fuse. Each manufacturer's molded case and metal case circuit breakers and/or fuses are grouped into representative samples which are then tested on a rotating basis to ensure that all breakers and/or fuses are tested. If a wide variety exists within any manufacturer's brand of circuit breakers and/or fuses, it is necessary to divide that manufacturer's breakers and/or fuses into groups and treat each group as a separate type of breaker of fuses for surveillance purposes.

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

Circuit breakers actuated by fault currents are used as isolation devices in this plant. The OPERABILITY of these circuit breakers ensures that the 1E busses will be protected in the event of faults in nonqualified loads powered by the busses.

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Revision 9

Conservative Requirements for Reactor Coolant System Specific Activity Limit

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TR 3/4.4.2 No current requirements

TR 3/4.4.3 No current requirements

TR 3/4.4.4 No current requirements

TR 3/4.4.5 No current requirements

TR 3/4.4.6 No current requirements

TR 3/4.4.7 No current requirements

The bold portions of this page represent more conservative requirements than Technical Specifications

REACTOR COOLANT SYSTEM

TR 3/4.4.8 SPECIFIC ACTIVITY

LIMITING CONDITION FOR OPERATION

TR 3.4.8 The specific activity of the primary coolant shall be limited to:

a. Less than or equal to **0.25** microcuries/gram DOSE EQUIVALENT I-131, and

b. Less than or equal to 100/$\bar{E}$ microcuries/gram.

APPLICABILITY: MODES 1, 2, 3, 4 and 5

ACTION:

MODES 1, 2 and 3*

a. With the specific activity of the primary coolant greater than **0.25** microcuries/gram DOSE EQUIVALENT I-131 for more than 48 hours during one continuous time interval or exceeding the limit line shown on Figure 3.4-1, be in at least HOT STANDBY with T_{avg} less than 500°F within 6 hours.

b. With the specific activity of the primary coolant greater than 100/$\bar{E}$ microcuries/gram, be in at least HOT STANDBY with T_{avg} less than 500°F within 6 hours.

MODES 1, 2, 3, 4 and 5

a. With the specific activity of the primary coolant greater than **0.25** microcuries/gram DOSE EQUIVALENT I-131 or greater than 100/$\bar{E}$ microcuries/gram, perform the sampling and analysis requirements of Item 4a of Table 4.4-4 until the specific activity of the primary coolant is restored to within its limits.

*With T_{avg} greater than or equal 500°F.

The bold portions of this page represent more conservative requirements than Technical Specifications

REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS

TR 4.4.8 The specific activity of the primary coolant shall be determined to be within the limits by performance of the sampling and analysis program of Table 4.4-4.

The bold portions of this page represent more conservative requirements than Technical Specifications

TABLE 4.4-4

PRIMARY COOLANT SPECIFIC ACTIVITY SAMPLE AND ANALYSIS PROGRAM

TYPE OF MEASUREMENT AND ANALYSIS	SAMPLE AND ANALYSIS FREQUENCY	MODES IN WHICH SAMPLE AND ANALYSIS REQUIRED
1. Gross Activity Determination	At least once per 72 hours	1, 2, 3, 4
2. Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	1 per 14 days	1
3. Radiochemical for $\overline{E}$ Determination	1 per 6 months*	1
4. Isotopic Analysis for Iodine Including I-131, I-133, and I-135	a. Once per 4 hours, whenever the specific activity exceeds **0.25** μCi/gram DOSE EQUIVALENT I-131 or 100/E μCi/gram, and	$1^{\#}, 2^{\#}, 3^{\#}, 4^{\#}, 5^{\#}$
	b) One sample between 2 and 6 hours following a THERMAL POWER change exceeding 15 percent of the RATED THERMAL POWER within a one hour period.	1, 2, 3

$^{\#}$Until the specific activity of the primary coolant system is restored within its limits.

*Sample to be taken after a minimum of 2 EFPD and 20 days of POWER OPERATION have elapsed since the reactor was last subcritical for 48 hours or longer.

The unbolded Specific Activity value and figure limits are more conservative than the Technical Specification requirements

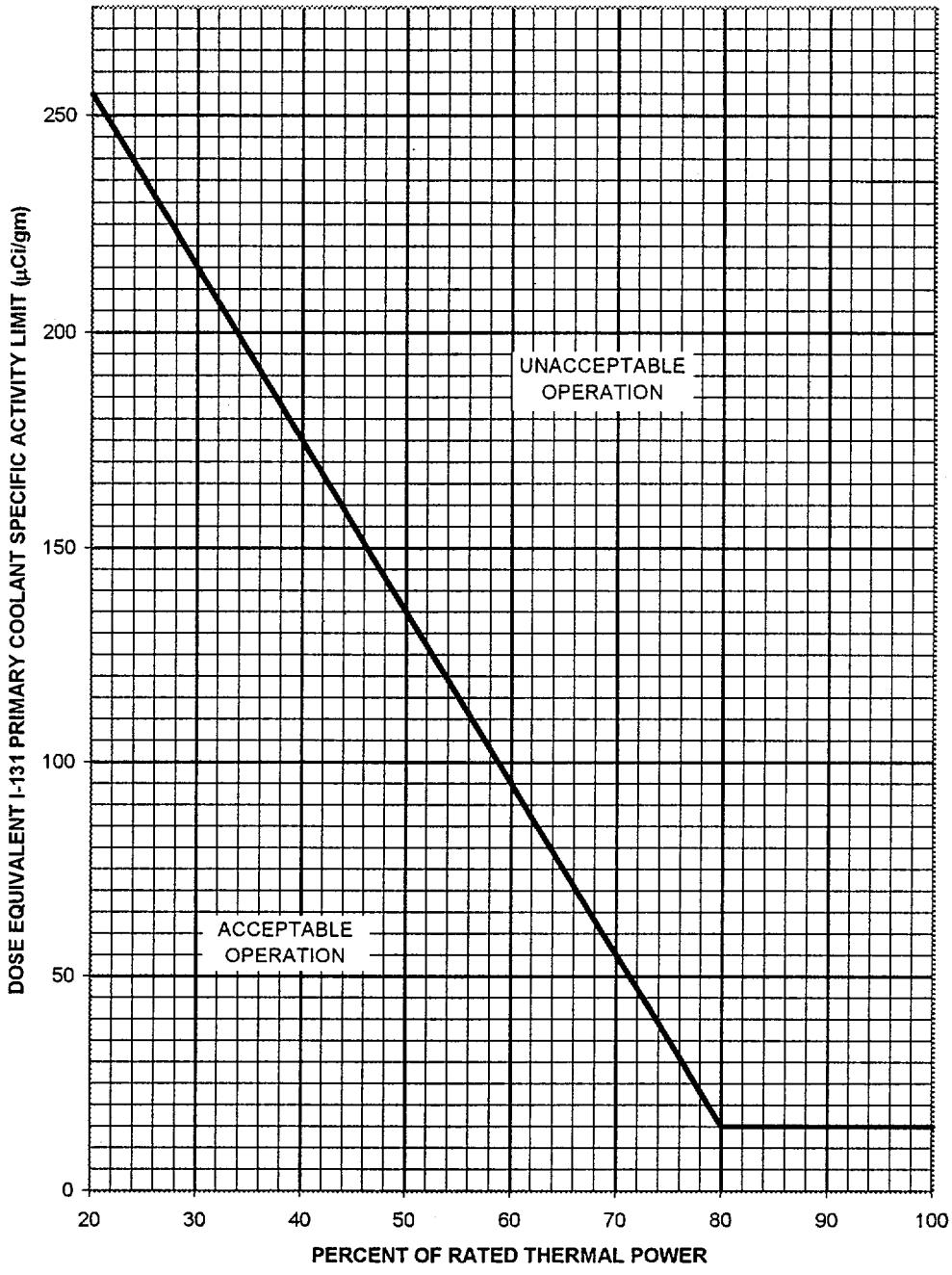

FIGURE 3.4-1
DOSE EQUIVALENT I-131 Primary Coolant Specific Activity Limit Versus Percent of RATED THERMAL POWER with the Primary Coolant Specific Activity > 0.25 µCi/gram Dose Equivalent I-131

TRB 3/4.4 REACTOR COOLANT SYSTEMS

BASES

REACTOR COOLANT SYSTEM

TRB 3/4.4.1 No current discussions

TRB 3/4.4.2 No current discussions

TRB 3/4.4.3 No current discussions

TRB 3/4.4.4 No current discussions

TRB 3/4.4.5 No current discussions

TRB 3/4.4.6 No current discussions

TRB 3/4.4.7 No current discussions

The bold portions of this page represent more conservative requirements than Technical Specifications

TRB 3/4.4.8 SPECIFIC ACTIVITY

The limitations on the specific activity of the primary coolant ensure that the resulting 2 hour doses at the site boundary will not exceed an appropriately small fraction of Part 100 limits following a steam generator tube rupture accident in conjunction with an assumed steady state primary-to-secondary steam generator leakage rate of 1.0 GPM. The values for the limits on specific activity represent interim limits based upon a parametric evaluation by the NRC of typical site locations. These values are conservative in that specific site parameters of the Sequoyah Nuclear Plant site, such as site boundary location and meteorological conditions, were not considered in this evaluation.

The ACTION statement permitting POWER OPERATION to continue for limited time periods with the primary coolant's specific activity greater than or equal to **0.25** microcuries/gram DOSE EQUIVALENT I-131, but within the allowable limit shown on Figure 3.4-1, accommodates possible iodine spiking phenomenon which may occur following changes in THERMAL POWER. Operation with specific activity levels exceeding **0.25** microcuries/gram DOSE EQUIVALENT I-131 but within the limits shown on Figure 3.4-1 should be limited to no more than 800 hours per year since the activity levels allowed by Figure 3.4-1 increase the 2-hour thyroid dose at the site boundary by a factor of up to 20 following a postulated steam generator tube rupture.

Reducing T_{avg} to less than 500°F prevents the release of activity should a steam generator tube rupture since the saturation pressure of the primary coolant is below the lift pressure of the atmospheric steam relief valves. The surveillance requirements provide adequate assurance that excessive specific activity levels in the primary coolant will be detected in sufficient time to take corrective action. Information obtained on iodine spiking will be used to assess the parameters associated with spiking phenomena. A reduction in frequency of isotopic analyses following power changes may be permissible if justified by the data obtained.

Technical Requirements Manual

Revision 10

Control Room Air Temperature Control System

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TR 3/4.7 PLANT SYSTEMS

TR 3/4 7.10 No current requirements

TR 3/4 7.11 No current requirements

TR 3/4 7.12 No current requirements

PLANT SYSTEMS

TR 3/4.7.13 CONTROL ROOM AIR TEMPERATURE CONTROL SYSTEM (CRATCS)

LIMITING CONDITION FOR OPERATION

TR 3.7.13 Two independent control room air temperature control systems (CRATCS) shall be OPERABLE.

APPLICABILITY: ALL MODES and During Movement of Irradiated Fuel

ACTION:

MODES 1, 2, 3 and 4

a. With one CRATCS inoperable, restore the inoperable system to OPERABLE status within 30 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With both CRATCS inoperable, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

MODES 5 and 6 and during movement of irradiated fuel assemblies

a. With one CRATCS inoperable, restore the inoperable system to OPERABLE status within 30 days or initiate and maintain operation of the OPERABLE CRATCS

   or

   suspend movement of irradiated fuel assemblies.

b. With both CRATCS inoperable, suspend all operations involving movement of irradiated fuel assemblies.

SURVEILLANCE REQUIREMENTS

TR 4.7.13 CRATCS shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the control room air temperature is less than or equal to 104°F.

TRB 3/4.7.10 No current discussions

TRB 3/4.7.11 No current discussions

TRB 3/4.7.12 No current discussions

TRB 3/4.7.13 Control Room Air Temperature Control System (CRATCS)

BACKGROUND

The CRATCS provides temperature control for the control room during normal operation and following isolation of the control room. The Unit 1 and Unit 2 control room is a common room served by a shared CRATCS.

The CRATCS consists of two independent and redundant trains that provide cooling of recirculated control room air. Each train consists of a chiller package, cooling coils, air handling unit, instrumentation, and controls to provide for control room temperature control.

The CRATCS is a normal and emergency system. A single train will provide the required temperature control. The CRATCS operation in maintaining the control room temperature is discussed in the FSAR, Section 6.4 and 9.4.1 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The design basis of the CRATCS is to maintain the control room temperature during normal and Design Basis Accident conditions.

The CRATCS components are arranged in redundant, safety related trains. During normal and emergency operation, the CRATCS maintains the temperature at or below the continuous duty rating for equipment and instrumentation. A single active failure of a component of the CRATCS, with a loss of offsite power, does not impair the ability of the system to perform its design function. Redundant detectors and controls are provided for control room temperature control. The CRATCS is designed in accordance with Seismic Category I requirements. The CRATCS is capable of removing sensible and latent heat loads from the control room, which include consideration of equipment heat loads and personnel occupancy requirements, to ensure equipment OPERABILITY.

LCO

Two independent and redundant trains of the CRATCS are required to be OPERABLE to ensure that at least one is available, assuming a single failure disabling the other train. Total system failure could result in the equipment operating temperature exceeding limits during normal operation or in the event of an accident.

The CRATCS is considered to be OPERABLE when the individual components necessary to maintain the control room

(continued)

LCO (continued) temperature are OPERABLE in both trains. These components include the chiller package, cooling coils, air handling unit, instrumentation, and controls.

APPLICABILITY In MODES 1, 2, 3, 4, 5, and 6, and during movement of irradiated fuel assemblies, the CRATCS must be OPERABLE to ensure that the control room temperature will not exceed equipment operational requirements.

ACTIONS

MODES 1, 2, 3 and 4 - Action a.

With one CRATCS train inoperable, action must be taken to restore OPERABLE status within 30 days. In this Condition, the remaining OPERABLE CRATCS train is adequate to maintain the control room temperature within limits. However, the overall reliability is reduced because a single failure in the OPERABLE CRATCS train could result in loss of CRATCS function. The 30 day Completion Time is based on the low probability of an event requiring control room isolation, the consideration that the remaining train can provide the required protection, and that alternate safety or nonsafety related cooling means are available. Additionally, if the inoperable CRATCS train cannot be restored to OPERABLE status within 30 days, the unit must be placed in a MODE that minimizes the risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within the following 30 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

MODES 1, 2, 3 and 4 - Action b.

If both trains of CRATCS are inoperable, the unit must be placed in a MODE that minimizes the risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within the following 30 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

(continued)

ACTIONS (continued)

MODES 5 and 6 and during movement of irradiated fuel assemblies - Action a.

In MODE 5 or 6, or during movement of irradiated fuel, if the inoperable CRATCS train cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE CRATCS train must be placed in operation immediately. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that active failures will be readily detected.

An alternative is to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

MODES 5 and 6 and during movement of irradiated fuel assemblies - Action b.

In MODE 5 and 6 and during movement of irradiated fuel assemblies with two CRATCS trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

Surveillance 4.7.13.a

This SR verifies that CRATCS is maintaining the control room temperature at or below the continuous duty rating for equipment and instrumentation. This SR consists of monitoring the control room temperature at least once per 12 hours.

REFERENCES

1. FSAR, Sections 6.4 and 9.4.1.

Technical Requirements Manual

Revision 11

Removal of Conservative Control Room Emergency Ventilation Requirements for Radiation Monitors

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INSTRUMENTATION

TR 3/4.3.1	No current requirements
TR 3/4.3.2	No current requirements
TR 3/4.3.3.1	No current requirements
TR 3/4.3.3.2	No current requirements

TR 3/4.7 PLANT SYSTEMS

TR 3/4.7.7 No current requirements

TR 3/4.7.8 No current requirements

Technical Requirements Manual

Revision 12

Addition of Heating, Ventilation, and Air Conditioning Requirements for Maintenance Rule Unavailability

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TECHNICAL REQUIREMENTS

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TECHNICAL REQUIREMENTS BASES

PLANT SYSTEMS

TR 3/4.7.14 HEATING, VENTILATING, AND AIR CONDITIONING (HVAC) MAINTENANCE RULE EQUIPMENT

LIMITING CONDITION FOR OPERATION

TR 3.7.14 The HVAC components shown in Table 3.7.14-1 shall be OPERABLE.

APPLICABILITY: As shown in Table 3.7.14-1.

ACTION:

With any of the HVAC components on Table 3.7.14-1 inoperable, enter the associated LCO in the Operation narrative logs and LCO tracking logs for Maintenance Rule Unavailability tracking.

SURVEILLANCE REQUIREMENTS

None

TABLE 3.7.14-1
HVAC MAINTENANCE RULE EQUIPMENT

	EQUIPMENT	COMPONENTS	APPLICABLE MODES
1.	Electric Board Room Cooling, A Train	A Train chiller and air handling unit	ALL MODES
2.	Electric Board Room Cooling, B Train	B Train chiller and air handling unit	ALL MODES
3.	6.9KV Shutdown Board Room Cooling, A Train	A Train chiller, chilled water system, and 1A and 2A air handling units	ALL MODES
4.	6.9KV Shutdown Board Room Cooling, B Train	B Train chiller, chilled water system, and 1B and 2B air handling units	ALL MODES
5.	1A 480V Electric Board Room Cooling	A chiller, condensing and air handling units	ALL MODES
6.	1B 480V Electric Board Room Cooling	1B chiller, condensing and air handling units	ALL MODES
7.	2A 480V Electric Board Room Cooling	2A chiller, condensing and air handling units	ALL MODES
8.	2B 480V Electric Board Room Cooling	2B chiller, condensing and air handling units	ALL MODES
9.	1A 480V Transformer Room Ventilation	1A1-A, 1A2-A, 1A3-A, and 1A4-A exhaust fans	ALL MODES
10.	1B 480V Transformer Room Ventilation	1B1-B, 1B2-B, and 1B3-B exhaust fans	ALL MODES
11.	2A 480V Transformer Room Ventilation	2A1-A, 2A2-A, and 2A3-A, exhaust fans	ALL MODES
12.	2B 480V Transformer Room Ventilation	2B1-B, 2B2-B, 2B3-B, and 2B4-B exhaust fans	ALL MODES
13.	Thermal Barrier Booster Pump & Spent Fuel Pit Pump Cooler, A Train	A Train Cooler	Modes 1,2,3,& 4
14.	Thermal Barrier Booster Pump & Spent Fuel Pit Pump Cooler, B Train	B Train Cooler	Modes 1,2,3,& 4

TRB 3/4.7 Plant Systems

TRB 3/4.7.14 Heating, Ventilating, and Air Conditioning (HVAC) Maintenance Rule Equipment

Bases

BACKGROUND	The HVAC equipment listed on Table 3.7-6 is required to be tracked for unavailability by Sequoyah's implementation of 10CFR50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." This HVAC equipment has been determined to be "Risk Significant" equipment, and the requirements of the Maintenance Rule program requires that the time this equipment is inoperable, be monitored and trended, whether due to an unplanned failure or planned maintenance. The required operability of the HVAC equipment is commensurate with the required operability of the equipment being cooled, and the final Maintenance Rule unavailability time will be determined by Engineering. The equipment listed on Table 3.7-6 has no Technical Specification LCO or other associated TRM action for operability. 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.
LCO	This TRM is being implemented to track the unavailability time of the associated HVAC equipment. This equipment is considered to be OPERABLE when the individual components necessary to maintain the associated area temperature below the design required limits are OPERABLE. These components include the chiller package, cooling coils, air handling unit, pumps, fan, dampers, instrumentation, and controls as applicable to the various systems.
APPLICABILITY	Cooling for the Electric Board Rooms, 6.9KV Shutdown Board Rooms, 480V Electric Board Rooms and ventilation to the 480V Transformer Rooms is required for all modes due to the commonality of the equipment served, requirements for accident mitigation, and the ability to cross tie the 480V board room cooling between Units 1 & 2. Cooling to the Thermal Barrier Booster Pump & Spent Fuel Pit Pump Area is only required in MODES 1, 2, 3, 4 for the applicable Unit.

(continued)

BASES (continued)

ACTIONS	With any of the equipment listed in Table 3.7-6 inoperable, the corresponding TRM for that Unit and Train of equipment shall be entered into the Operation narrative logs and LCO tracking logs for tracking the unavailability time.
SURVEILLANCE REQUIREMENTS	This TRM is for tracking purposes only. There are no Surveillance Requirements associated with this TRM.
REFERENCES	1. SPP-6.6, "Maintenance Rule Performance Indicator Monitoring Trending and Reporting - 10 CFR 50.65." 2. 0-TI-SXX-000-004.0, Maintenance Rule Performance Indicator Monitoring Trending and Reporting - 10 CFR 50.65." Attachment 5, "Heating, Ventilation and Air Conditioning - System 30." 3. SQN-DC-V-21.0, "Sequoyah Nuclear Plant - Environmental Design Criteria."

Technical Requirements Manual

Revision 13

Addition of Boration Control Systems and
Rod Position Indication System During Shutdown

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TECHNICAL REQUIREMENTS

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TECHNICAL REQUIREMENTS BASES

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TR 3/4 1.1 No current requirements

REACTIVITY CONTROL SYSTEMS

TR 3/4.1.2 BORATION SYSTEMS

FLOW PATHS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

TR 3.1.2.1 As a minimum, one of the following boron injection flow paths shall be OPERABLE:

a. A flow path from the boric acid tank via a boric acid transfer pump and charging pump to the Reactor Coolant System if only the boric acid storage tank in TR 3.1.2.5a is OPERABLE, or

b. The flow path from the refueling water storage tank via a charging pump to the Reactor Coolant System if only the refueling water storage tank in TR 3.1.2.5b is OPERABLE.

APPLICABILITY: MODES 4, 5 and 6.

ACTION:

MODE 4 - With none of the above flow paths OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes and restore one flow path as soon as possible.

MODES 5 and 6 - With none of the above flow paths OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

SURVEILLANCE REQUIREMENTS

TR 4.1.2.1 At least one of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that the temperature of the areas containing flow path components from the boric acid tanks to the blending tee is greater than or equal to 63°F when it is a required water source.

b. Whenever the area temperature(s) is(are) less than 63°F and the boric acid tank is a required water source, the solution temperature in the flow path components from the boric acid tank must be measured to be greater than or equal to 63°F within 6 hours and every 24 hours thereafter until the area temperature(s) has(have) returned to greater than or equal to 63°F.

c. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

REACTIVITY CONTROL SYSTEMS

FLOW PATHS - OPERATING

LIMITING CONDITION FOR OPERATION

TR 3.1.2.2 At least two of the following three boron injection flow paths shall be OPERABLE:

a. The flow path from the boric acid tanks via a boric acid transfer pump and a charging pump to the Reactor Coolant System.

b. Two flow paths from the refueling water storage tank via charging pumps to the Reactor Coolant System.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

With only one of the above required boron injection flow paths to the Reactor Coolant System OPERABLE, restore at least two boron injection flow paths to the Reactor Coolant System to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F within the next 6 hours; restore at least two flow paths to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

TR 4.1.2.2 At least two of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that the temperature of the areas containing flow path components from the boric acid tanks to the blending tee is greater than or equal to 63°F when it is a required water source.

b. Whenever the area temperature(s) is(are) less than 63°F and the boric acid tank is a required water source, the solution temperature in the flow path components from the boric acid tank must be measured to be greater than or equal to 63°F within 6 hours and every 24 hours thereafter until the area temperature(s) has(have) returned to greater than or equal to 63°F.

c. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

d. At least once per 18 months during shutdown by verifying that each automatic valve in the flow path actuates to its correct position on a safety injection test signal.

e. At least once per 18 months by verifying that the flow path required by TR 3.1.2.2a delivers at least 35 gpm to the Reactor Coolant System.

REACTIVITY CONTROL SYSTEMS

CHARGING PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

TR 3.1.2.3 One charging pump in the boron injection flow path required by TR 3.1.2.1 shall be OPERABLE and capable of being powered from an OPERABLE shutdown board.

APPLICABILITY: MODES 4, 5 and 6.

ACTION:

MODE 4 - With no charging pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes and restore one charging pump as soon as possible.

MODES 5 and 6 - With no charging pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

SURVEILLANCE REQUIREMENTS

TR 4.1.2.3 The above required charging pump shall be demonstrated OPERABLE by verifying, that on recirculation flow, the pump develops a discharge pressure of greater than or equal to 2400 psig when tested pursuant to TR 4.0.5.

REACTIVITY CONTROL SYSTEMS

CHARGING PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

TR 3.1.2.4 At least two charging pumps shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

With only one charging pump OPERABLE, restore at least two charging pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F within the next 6 hours; restore at least two charging pumps to OPERABLE status within the next 7 days or be in HOT SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

TR 4.1.2.4 At least two charging pumps shall be demonstrated OPERABLE by verifying, that on recirculation flow, each pump develops a discharge pressure of greater than or equal to 2400 psig when tested pursuant to TR 4.0.5.

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

TR 3.1.2.5 As a minimum, one of the following borated water sources shall be OPERABLE:

a. A boric acid storage system with:

1. A minimum contained borated water volume of 5000 gallons,

2. Between 6120 and 6990 ppm of boron, and

3. A minimum solution temperature of 63°F.

b. The refueling water storage tank with:

1. A minimum contained borated water volume of 55,000 gallons,

2. A minimum boron concentration of 2500 ppm, and

3. A minimum solution temperature of 60°F.

APPLICABILITY: MODES 4, 5 and 6.

ACTION:

With no borated water source OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

SURVEILLANCE REQUIREMENTS

TR 4.1.2.5 The above required borated water source shall be demonstrated OPERABLE:

a. For the boric acid storage system, when it is the source of borated water by:

1. Verifying the boron concentration at least once per 7 days,

2. Verifying the borated water volume at least once per 7 days, and

3. Verifying the boric acid storage tank solution temperature is greater than or equal to 63°F at least once per 7 days by verifying the area temperature to be greater than or equal to 63°F, or

4. When the boric acid tank area temperature is less than 63°F and the boric acid storage system being used as the source of borated water, within 6 hours and every 24 hours thereafter, verify the boric acid tank solution temperature to be greater than or equal to 63°F until the boric acid tank area temperature has returned to greater than or equal to 63°F.

b. For the refueling water storage tank by:

1. Verifying the boron concentration at least once per 7 days,

2. Verifying the borated water volume at least once per 7 days, and

3. Verifying the solution temperature at least once per 24 hours while in Mode 4 or while in Modes 5 or 6 when it is the source of borated water.

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

TR 3.1.2.6 As a minimum, the following borated water source(s) shall be OPERABLE as required by TR 3.1.2.2:

a. A boric acid storage system with:

1. A contained volume of borated water in accordance with Figure 3.1.2.6,

2. A boron concentration in accordance with Figure 3.1.2.6, and

3. A minimum solution temperature of 63°F.

b. The refueling water storage tank with:

1. A contained borated water volume of between 370,000 and 375,000 gallons,

2. Between 2500 and 2700 ppm of boron,

3. A minimum solution temperature of 60°F, and

4. A maximum solution temperature of 105°F.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

a. With the boric acid storage system inoperable and being used as one of the above required borated water sources, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in HOT SHUTDOWN within the next 30 hours.

b. With the refueling water storage tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

TR 4.1.2.6 Each borated water source shall be demonstrated OPERABLE:

a. For the boric acid storage system, when it is the source of borated water by:

1. Verifying the boron concentration at least once per 7 days,

2. Verifying the borated water volume at least once per 7 days, and

3. Verifying the boric acid storage tank solution temperature is greater than or equal to 63°F at least once per 7 days by verifying the area temperature to be greater than or equal to 63°F, or

4. Whenever the boric acid tank area temperature is less than 63°F and the boric acid storage system being used as the source of borated water, within 6 hours thereafter, verify the boric acid tank solution temperature to be greater than or equal to 63°F until the boric acid tank area temperature has returned to greater than or equal to 63°F.

b. For the refueling water storage tank by:

1. Verifying the boron concentration at least once per 7 days,

2. Verifying the borated water volume at least once per 7 days, and

3. Verifying the solution temperature at least once per 24 hours.

BORIC ACID TANK REQUIRED VOLUME vs. BORIC ACID TANK CONCENTRATION

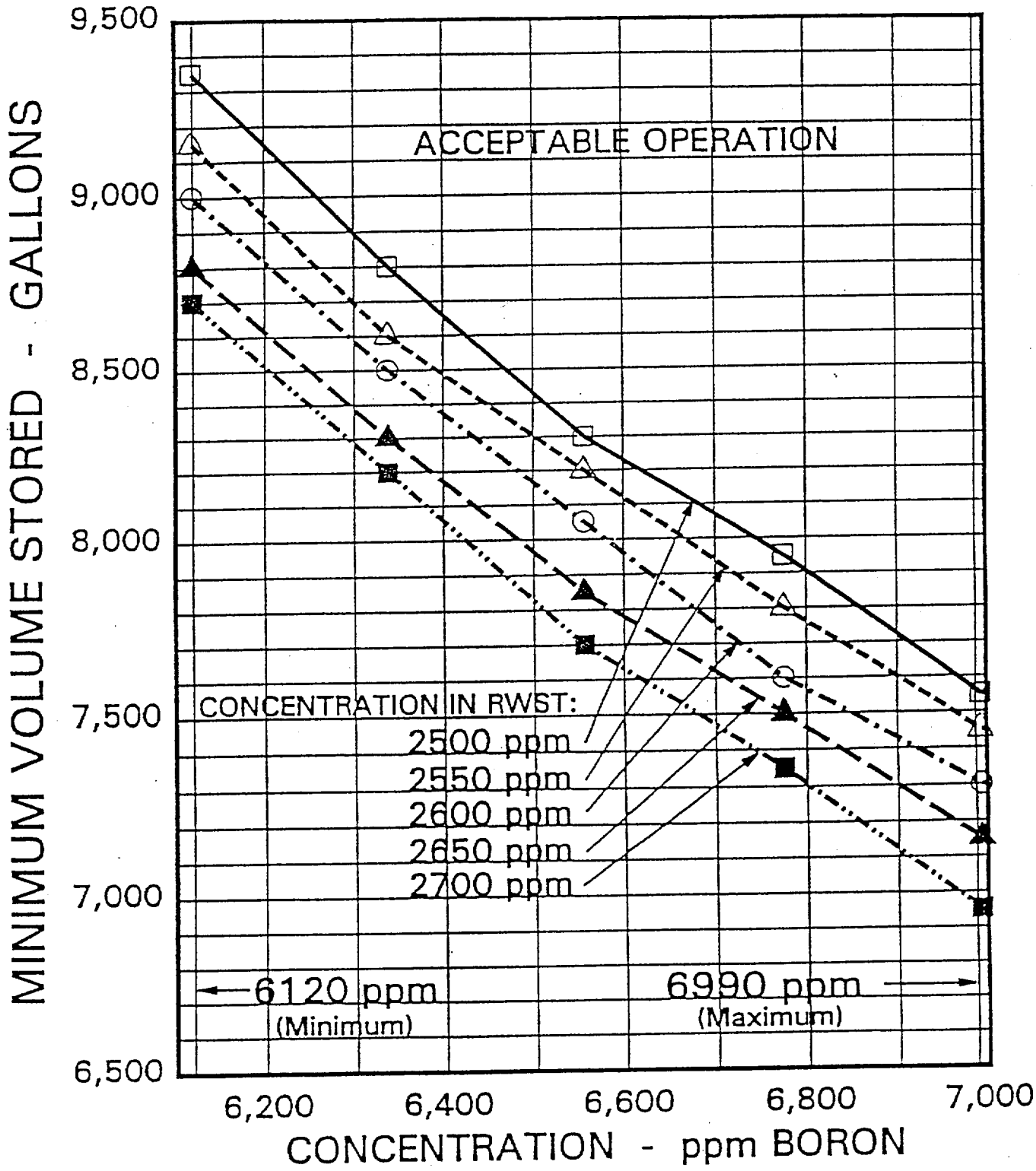

FIGURE 3.1.2.6

TR 3/4.1 REACTIVITY CONTROL SYSTEMS

TR 3/4 1.3.1 No current requirements

TR 3/4 1.3.2 No current requirements

POSITION INDICATION SYSTEM - SHUTDOWN

LIMITING CONDITION FOR OPERATION

TR 3.1.3.3 The group demand position indicator shall be OPERABLE and capable of determining within ± 2 steps, the demand position for each shutdown or control rod not fully inserted.

APPLICABILITY: MODES 3*, 4* and 5*.

ACTION:

With less than the above required group demand position indicator(s) OPERABLE, immediately open the reactor trip system breakers.

SURVEILLANCE REQUIREMENTS

TR 4.1.3.3 Each of the above required group demand position indicator(s) shall be determined to be OPERABLE by movement of the associated control rod at least 10 steps in any one direction at least once per 31 days.

*With the reactor trip system breakers in the closed position.

TRB 3/4.1 REACTIVITY CONTROL SYSTEMS

BASES

TRB 3/4 1.1 No current discussions

TRB 3/4.1.2 BORATION SYSTEMS

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) an emergency power supply from OPERABLE diesel generators.

With the RCS average temperature above 350°F, a minimum of two boron injection flow paths are required to ensure single functional capability in the event an assumed failure renders one of the flow paths inoperable. The boration capability of either flow path is sufficient to provide a SHUTDOWN MARGIN from expected operating conditions of 1.6% delta k/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 3.1.2.6, and additional makeup 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 57,000 gallons of 2500 ppm borated water is required.

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 positive reactivity change in the event the single injection system becomes inoperable.

The boron capability required below 350°F, is sufficient to provide a SHUTDOWN MARGIN of 1.6% delta k/k after xenon decay and cooldown from 350°F to 200°, and a SHUTDOWN MARGIN of 1% delta k/k after xenon decay and cooldown from 200°F to 140°F. This condition requires either 5000 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.

The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics. 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 shutdown margin, and an additional 221 gallons due to rounding up.

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 LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

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

TRB 3/4.1 REACTIVITY CONTROL SYSTEMS

TRB 3/4 1.3.1 No current discussions

TRB 3/4 1.3.2 No current discussions

TRB 3/4.1 REACTIVITY CONTROL SYSTEMS

TRB 3/4.1.3.3 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 OPERABLE. TR 3.1.3.3 is required to ensure OPERABILITY 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 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 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 OPERABLE 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.

(continued)

BASES (continued)

TECHNICAL REQUIREMENT	TR 3.1.3.3 specifies that the group demand position indicators be OPERABLE and capable of determining within ± 2 steps the demand position for each shutdown or control rod not fully inserted. For the control rod position indicators to be OPERABLE requires meeting the surveillance 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. OPERABILITY of the required position indicators ensures that inoperable, misaligned, or mispositioned control rods can be detected.
APPLICABILITY	This TR 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 3.1.3.2. In MODE 6 and in MODES 3, 4, and 5 with trip breakers open or all rods on the bottom, Rod Position Indication is not required to be OPERABLE. Rod Position Indication OPERABILITY is required only when rods are withdrawn from fully inserted.
ACTIONS	With one or more group demand position indicators inoperable, the plant must be placed in a condition where the demand position indicators are not required. This is accomplished by opening the reactor trip breakers immediately. The immediate Completion Time is consistent with the required time for actions to be pursued without delay and in a controlled manner.
TECHNICAL REQUIREMENT SURVEILLANCE	TR 4.1.3.3 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 OPERABLE. A movement of 10 steps is adequate to demonstrate motion and verify a corresponding step change in the group step counter demand position indicator. 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.
REFERENCES	None