TECHNICAL REQUIREMENTS MANUAL REVISION **7**

ARKANSAS NUCLEAR ONE, UNIT NO. 1

Replace the following pages of the associated Technical Requirements Manual with the attached pages.

	REMOVE PAGES	INSERT PAGES
Index Pages		
	iii	-------------------------iii
Technical Requirements Pages		
	-----	-------------------------B 3.7.6-1
	B 3.8.4-1	-------------------------B 3.8.4-1

1.0 USE AND APPLICATIONS

1.0.1 Introduction

Based on the NRC's Final Policy Statement on Technical Specification Improvements for nuclear power plants, and 10 CFR 50.36, certain requirements may be relocated from the Technical Specifications (TS) to other licensee controlled documents (SAR, ODCM, administrative procedures). The Technical Requirements Manual (TRM) has been developed in an effort to centralize the requirements relocated from the TS and to ensure the necessary administrative controls are applied to these requirements.

The TRM is intended for use as an operator aid that provides a central location for relocated items in a TS format. The individual TRM specifications are called Technical Requirements for Operations (TROs) and are written in the current TS format. In addition to the TS numbering and format for relocated items, the TRM provides a reference to the TS when appropriate to assist the user in connecting the relocated information to the applicable TS. Some of the information in the TRM may also be duplicated in other ANO documents, such as, the SAR, ODCM, or Fire Protection Program.

1.0.2 TRM Format

The TRM format is sectioned and numbered similar to the TS. However, this format produces a TRM without a sequenced numbering system for the TROs and the associated sections. An example of this condition would be that the TRM contains a 1.0 section without a 2.0 section. The page numbering in the TRM is sequential within the TROs. A Table-of-Contents is provided to clarify the page numbering scheme and layout of the TRM.

1.0.3 Regulatory Status And Requirements

The requirements in the TRM are considered as part of the licensing basis (a part of the SAR) and are to be treated as such. Failure to comply with a TRO should be evaluated in accordance with the ANO corrective action program. These deviations from the TRM will be reviewed for operability and reportability in accordance with the applicable administrative procedures and regulatory requirements.

These controls are necessary because the purpose of relocating the requirements from TS is not to reduce the level of control on these items. The purpose of relocating the requirements is to provide the flexibility for their modification without requiring a TS change.

1.0.4 Changes To The TRM

Design modifications, procedure changes, license amendments, etc. have the potential to affect the TRM. If this occurs, the initiating department should complete a License Based Document Change form for submitting changes to the TRM. TRM changes are subject to the requirements of 10 CFR 50.59 due to the TRM being considered a part of the SAR and therefore a licensing basis document. Changes to the TRM will be issued on a replacement page basis to controlled document holders following approval of the change in accordance with site procedures on document control.

1.0.5 NRC Reporting Of TRM Revisions

Like the SAR, changes to the TRM are controlled under 10 CFR 50.59 and therefore do not require prior NRC approval unless the change involves a change to the TS or the need for a license amendment in accordance with 10 CFR 50.59 is required. The most recent revision of the TRM will be sent to the NRC as part of the periodic SAR update process.

1.0.6 TS Applicability To The TRM

The TRM may reference a TS LCO or Surveillance Requirement (SR) that applies to the relocated information. All TRM references to the TS will be preceded by “TS" or "Technical Specification” and then the associated specification number.

1.0 USE AND APPLICATION

1.1 DEFINITIONS

---NOTE---
The defined terms of this section appear in capitalized type and are applicable throughout this Technical Requirements Manual.

Term	Definition
CHANNEL CALIBRATION	A test, and adjustment (if necessary), to establish that the channel output responds with acceptable range and accuracy to known values of the parameter which the channel measures or an accurate simulation of these values. CHANNEL CALIBRATION shall encompass the entire channel, including equipment actuation, alarm or trip and shall be deemed to include the CHANNEL TEST. This test may be performed by means of any series of sequential, overlapping, or total steps.
CHANNEL CHECK	A verification of acceptable instrument performance by observation of its behavior and/or state. This verification includes, where possible, comparison of output and/or state of independent channels measuring the same variable.
CHANNEL TEST	The injection of an internal or external test signal into a channel to verify its proper response, including alarm and/or trip initiating action, where applicable. This test may be performed by means of any series of sequential, overlapping, or total steps.
INSTRUMENT CHANNEL	An instrument channel is the combination of sensor, wires, amplifiers and output devices which are connected for the purpose of measuring the value of a process variable for the purpose of observation, control and/or protection. An instrument channel may be either analog or digital.
MODE	Corresponds to any one inclusive combination of core reactivity condition, power level, average reactor coolant temperature, and reactor vessel head closure bolt tensioning specified in TRM Table 1.1-1 with fuel in the reactor vessel.
OPERABLE - OPERABILITY	A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal or emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its functions(s) are also capable of performing their related support function(s).

TRM 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	≥ 280
4	Hot Shutdown [(b)]	< 0.99	NA	280 > 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.

3.0 TECHNICAL REQUIREMENT FOR OPERATION (TRO) APPLICABILITY

TRO 3.0.1	The TROs shall be applicable during the MODES or other conditions specified for each requirement.
TRO 3.0.2	Upon discovery of a failure to meet a TRO, the Required Actions of the associated Conditions shall be met, except as provided in TRO 3.0.5.
TRO 3.0.3	When a TRO is not met and the associated Required Actions are not met, an associated Required Action is not provided, or if directed by the associated Required Actions, immediately initiate a condition report to document the condition and determine any limitations for continued operation of the plant. Exceptions to this TRO are stated in the individual Technical Requirements. TRO 3.0.3 is only applicable in MODES 1, 2, 3, and 4.
TRO 3.0.4	Entry into a MODE or other specified condition in the Applicability shall not be made when the conditions of a TRO are not met and the corrective action process has determined that limitations should be placed on continued plant operation. Entry into a MODE or other specified condition may be made in accordance with Required Actions when the corrective action process has determined that no limitations should be placed on continued plant operation. This provision shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with Required Actions or that are part of a shutdown of the unit. Exceptions to this TRO are stated in the individual Technical Requirements.
TRO 3.0.5	Equipment removed from service or declared inoperable to comply with Required Actions may be returned to service under administrative control solely to perform testing required to demonstrate OPERABILITY or the OPERABILITY of other equipment. This is an exception to TRO 3.0.2 for the system returned to service under administrative control to perform the testing required to demonstrate OPERABILITY.

TEST REQUIREMENT (TR) APPLICABILITY

TR 3.0.1	TRs shall be met during the operational modes or other conditions specified for individual TROs unless otherwise stated in a TR. Failure to meet a TR, whether such failure is experienced during the TR performance or between performances of the TR, shall constitute failure to meet the TRO. Failure to perform a TR within the specified Frequency shall be failure to meet the TRO except as provided in TR 3.0.3. TRs do not have to be performed on inoperable equipment or variables.
TR 3.0.2	The specified Frequency for each TR is met if the TR is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met. For Frequencies specified as "once," the above interval extension does not apply. If a Completion Time requires periodic performance on a "once per . . ." basis, the above Frequency extension applies to each performance after the initial performance. Exceptions to this requirement are stated in the individual TROs or TRs.
TR 3.0.3	If it is discovered that a TR was not performed within its specified Frequency, then compliance with the requirement to declare the TRO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is greater. This delay period is permitted to allow performance of the TR. A risk evaluation shall be performed for any Surveillance delayed greater than 24 hours and the risk impact shall be managed. If the TR is not performed within the delay period, the TRO must immediately be declared not met, and the applicable Condition(s) must be entered. When the TR is performed within the delay period and the TR is not met, the TRO must immediately be declared not met, and the applicable Condition(s) must be entered.
TR 3.0.4	Entry into a MODE or other specified condition shall not be made unless the TR(s) associated with the TRO has been performed within the specified frequency. This provision shall not prevent entry into MODES or other specified conditions as required to comply with Required Actions or that are part of a shutdown of the unit. TR 3.0.4 is only applicable for entry into a MODE or other specified condition in MODES 1, 2, 3, and 4.

TRM 3.3 INSTRUMENTATION

TRM 3.3.1 Control Room Ventilation Chlorine Monitors

TRO 3.3.1 Two channels of the Control Room Ventilation Chlorine Monitors shall be OPERABLE with alarm/trip setpoints adjusted to actuate at a chlorine concentration of ≤ 5 ppm.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required channel inoperable.	A.1 Restore inoperable channel to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate and maintain the Control Room Emergency Ventilation system in emergency recirculation mode.	6 hours
C. Both required channels inoperable.	C.1 Initiate and maintain the Control Room Emergency Ventilation system in emergency recirculation mode.	1 hour

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
TR 3.3.1.1 Perform a CHANNEL CHECK.	12 hours

TEST REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
TR 3.3.1.2	Perform a CHANNEL TEST.	31 days
TR 3.3.1.3	Perform a CHANNEL CALIBRATION.	18 months

TRM 3.3 INSTRUMENTATION

TRM 3.3.2 Seismic Monitoring Instrumentation

TRO 3.3.2 The seismic monitoring instrumentation shown in Table 3.3.2-1 shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required seismic monitoring instruments inoperable.	A.1 Restore required seismic monitoring instruments to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.3.2.1	-----------------------------NOTE----------------------------- Not required to be performed for seismic trigger. -- Perform a CHANNEL CHECK on required triaxial time-history accelerographs.	31 days

TEST REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
TR 3.3.2.2	Perform a CHANNEL TEST on required triaxial time-history accelerographs.	6 months
TR 3.3.2.3	Perform a CHANNEL TEST on required triaxial response-spectrum recorder.	18 months
TR 3.3.2.4	Perform a CHANNEL CALIBRATION on all required seismic monitoring instruments.	18 months

Table 3.3.2-1

Seismic Monitoring Instrumentation

	INSTRUMENTS AND SENSOR LOCATIONS	MEASUREMENT RANGE	MINIMUM INSTRUMENTS OPERABLE
1.	Triaxial Time-History Accelerographs		
	a. ACS-8001, Unit 1 Containment Base Slab, Elev. 335'*	0.01 g to 1.0 g	1
	b. ACS-8002, Unit 1 Top of Containment, Elev. 531'6"	0.01 g to 1.0 g	1
2.	Triaxial Peak Accelerographs		
	a. 2XR-8347, Unit 2 Containment Base Slab, Elev. 336'6"	0.05 g to 1.0 g	1
	b. 2XR-8348, Unit 2 Primary Shield O/S Reactor Cavity, Elev. 366'3"	0.05 g to 1.0 g	1
	c. 2XR-8349, Unit 2 Top of Containment, Elev. 531'6"	0.05 g to 1.0 g	1
3.	Triaxial Response-Spectrum Recorder		
	a. 2XR-8350, Unit 2 Containment Base Slab, Elev. 335'6" (O/S Containment)	2 Hz to 25.4 Hz	1

* With Unit 1 control room indication/alarm.

TRM 3.3 INSTRUMENTATION

TRM 3.3.4 Reactor Protection System (RPS) Shutdown Bypass

TRO 3.3.4 The key operated shutdown bypass switch associated with each reactor protection channel shall not be used.

---NOTE---
Not applicable during testing of RPS channels.

APPLICABILITY: MODE 1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TRO not met.	A.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
None.	

TRM 3.3 INSTRUMENTATION

TRM 3.3.5 Miscellaneous Instrumentation

TRO 3.3.5 Instruments specified in TRM Table 3.3.5-1 shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

-----NOTE-----
Core Flood Tank (CFT) pressure and level instrument OPERABILITY also applicable in MODE 3 when RCS pressure is > 800 psig.

ACTIONS

-----NOTE-----
1. Separate Condition entry is allowed for each instrument.
2. Condition entry is not required when inoperability is solely the result of in-progress testing per TR 3.3.5.1, 3.3.5.2, and/or 3.3.5.3 below.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TRO not met.	A.1 Initiate a condition report to document the condition and determine any limitations for the continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.3.5.1	Perform a CHANNEL CHECK of required instrumentation.	As required by TRM Table 3.3.5-1
TR 3.3.5.2	Perform a CHANNEL TEST of the required instrumentation.	As required by TRM Table 3.3.5-1
TR 3.3.5.3	Perform a CHANNEL CALIBRATION on the required instrumentation.	As required by TRM Table 3.3.5-1

Table 3.3.5-1

Miscellaneous Instrumentation

	INSTRUMENT	TEST REQUIREMENTS	FREQUENCY
1.	Decay Heat Removal System isolation valve automatic closure and interlock system[a]	TR 3.3.5.1[b] TR 3.3.5.3	12 hours 18 months
2.	Off-site power undervoltage and protective relaying interlocks and circuitry	TR 3.3.5.1	7 days
3.	Sodium Hydroxide Tank Level	TR 3.3.5.3	18 months
4.	Incore Neutron Detectors[c]	TR 3.3.5.1	31 days
5.	Low Temperature Overpressure Protection Alarm Logic	TR 3.3.5.2 TR 3.3.5.3	18 months 18 months
6.	Turbine overspeed trip mechanism	TR 3.3.5.2	18 months
7.	CFT pressure and level instruments[d]	TR 3.3.5.1 TR 3.3.5.3	12 hours 18 months

NOTES:

a. Surveillance testing required by Technical Specification SR 3.4.14.3 is performed with Reactor Coolant System (RCS) pressure ≥ 200 psig, but < 300 psig and includes RCS Pressure Analog Channel.

b. Includes RCS Pressure Analog Channel and Core Flood Tank Isolation Valve Position.

c. Check functioning. Not required to be met below 20% Rated Thermal Power.

d. Only one CFT pressure and one CFT level instrument required to be OPERABLE.

TRM 3.4 REACTOR COOLANT SYSTEMS

TRM 3.4.1 Reactor Internals Vent Valves

TRO 3.4.1 The structural integrity and OPERABILITY of the reactor internals vent valves shall be maintained.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more reactor internals vent valve(s) inoperable.	A.1	Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.4.1.1	Conduct a remote visual inspection of visually accessible surfaces of each reactor internals vent valve body and disc surfaces and evaluate any observed surface irregularities.	18 months
TR 3.4.1.2	Verify each reactor internals vent valve is not stuck in an open position.	18 months
TR 3.4.1.3	Verify through manual activation that each reactor internals vent valve is fully open with a force $\leq$ 400 lbs (applied vertically upward).	18 months

TRM 3.4 REACTOR COOLANT SYSTEMS

TRM 3.4.2 Reactor Coolant System Vents

TRO 3.4.2 At least one reactor coolant system vent path consisting of at least two valves in series shall be OPERABLE at each of the following locations:

a. Reactor vessel head,

b. Pressurizer steam space, and

c. Reactor coolant system Hot Leg high point vents (two locations).

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required vent path inoperable.	A.1 Verify inoperable vent path closed	1 hour <u>AND</u> Once per 12 hours thereafter
	<u>AND</u>	
	A.2 Restore required inoperable vent path to OPERABLE status.	30 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Two or more required vent paths inoperable.	B.1	Verify inoperable vent path closed	1 hour AND Once per 12 hours thereafter
	AND		
	B.2	Restore required inoperable vent path(s) to OPERABLE status such that at least three vent paths are operable.	72 hours
C. Required Actions and associated Completion Times of Condition A or B not met.	C.1	Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.4.2.1	-------------------------------NOTE------------------------------- This test shall not be performed in MODES 1, 2, 3, or 4. --- Perform flow verification through each vent path.	18 months

TRM 3.4 REACTOR COOLANT SYSTEMS

TRM 3.4.3 Pressurization, Heatup and Cooldown Limitations

TRO 3.4.3 In addition to the requirements of TS 3.4.3, “RCS Pressure and Temperature (P/T) Limits,” the following requirements must be met:

a. Secondary side of the steam generator shall not be pressurized to > 200 psig with temperature of steam generator shell < 100°F,

b. Pressurizer heatup and cooldown rate shall be ≤ 100°F, and

c. Temperature difference between pressurizer and spray fluid shall be ≤ 430°F.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Temperature difference between pressurizer and spray fluid not within limit.	A.1 Verify spray is not used	Immediately
	AND	
	A.2 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant	Immediately
	AND	
	A.3 Restore temperature to within limit.	30 minutes

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. TRO not met for reasons other than temperature difference between pressurizer and spray fluid.	B.1	Initiate a condition report to document the condition and determine any limitations for continued operation of the plant	Immediately
	<u>AND</u>		
	B.2	Restore temperature and/or pressure to within limit.	30 minutes
C. Required Actions and associated Completion Times not met.	C.1	Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
None.	

TRM 3.4 REACTOR COOLANT SYSTEMS

TRM 3.4.4 Reactor Coolant System (RCS) Chemistry

TRO 3.4.4 Reactor coolant concentrations of oxygen, chloride, and fluoride shall be within limits.

---NOTE---
Reactor coolant concentration of oxygen is not applicable when RCS temperature is ≤ 250°F.

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

ACTIONS

--NOTE--
Separate Condition entry is allowed for each RCS chemistry parameter.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS concentration of oxygen, chloride, or fluoride not within limits.	A.1 Initiate corrective action	8 hours
	AND	
	A.2 Restore RCS chemistry parameter to within limits.	32 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Actions and associated Completion Times not met OR RCS coolant concentration of oxygen > 1.0 ppm with concentration of chloride > 1.0 ppm OR RCS coolant concentration of oxygen > 1.0 ppm with concentration of fluoride > 1.0 ppm.	B.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.4.4.1	-------------------------------NOTE------------------------------- Verification of oxygen concentration is not required when RCS temperature is ≤ 250°F. -- Verify reactor coolant concentration of oxygen, as O_2, ≤ 0.10 ppm.	72 hours
TR 3.4.4.2	Verify reactor coolant concentration of chloride, as Cl^-, ≤ 0.15 ppm.	72 hours
TR 3.4.4.3	Verify reactor coolant concentration of fluoride, as F^-, ≤ 0.15 ppm.	72 hours

TRM 3.4 REACTOR COOLANT SYSTEMS

TRM 3.4.5 Reactor Coolant System (RCS) Operational Leakage

TRO 3.4.5 In addition to the requirements of TS 3.4.13, “Reactor Coolant System (RCS) Operational Leakage:”

a. All leakage shall be evaluated for safety implications, and

b. Total losses from the RCS shall be ≤ 30 gpm.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TS 3.4.13, Condition A, Condition B, or Condition C entered.	A.1 Initiate action to evaluate safety implication of RCS leakage.	4 hours
B. Required Action and associated Completion Time not met <u>OR</u> Total losses from RCS > 30 gpm.	B.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	1 hour

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
None.	

TRM 3.4 REACTOR COOLANT SYSTEMS

TRM 3.4.6 Control Rod Operation

TRO 3.4.6 In addition to the requirements of TS 3.1.4, “Control Rod Group Alignment Limits,” TS 3.1.5, “Safety Rod Insertion Limits,” and TS 3.1.6, “Axial Power Shaping Rod (APSR) Alignment Limits:”

a. The concentration of dissolved gases in the reactor coolant shall be ≤ 100 std. cc/liter of water at the reactor vessel outlet temperature, and

b. Allowable combinations of pressure and temperature for control rod operation shall be to the left of and above the curve shown in TRM Figure 3.4.6-1, “Limiting Pressure VS Temperature for Control Rod Drive Operation with 100 STD CC/Liter H_2O.”

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

ACTIONS

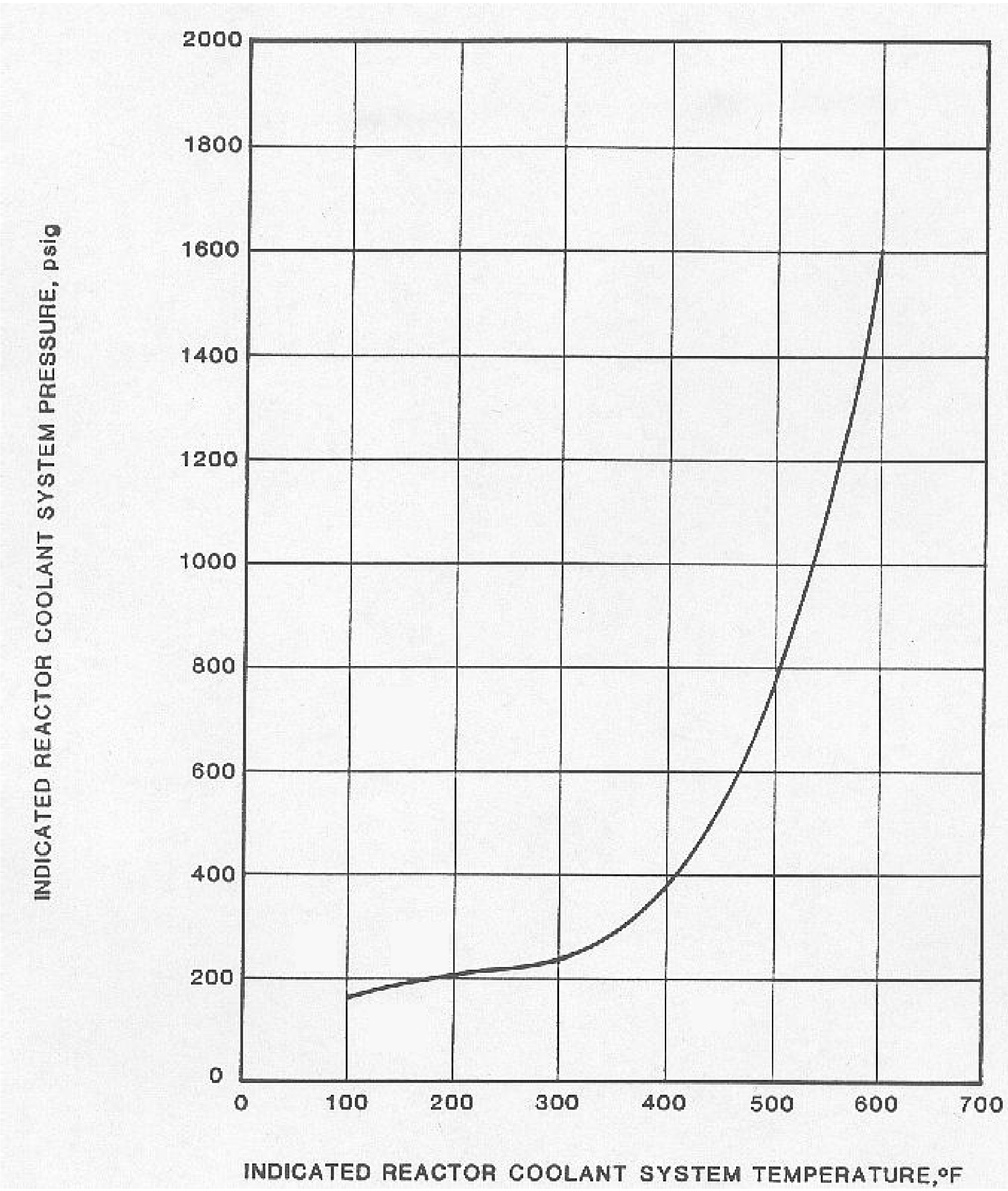
CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of TRO not met.	A.1 Check reactor vessel level instrument for accumulation of undissolved gases AND A.2 Restore parameters to within limits.	24 hours 24 hours
B. Required Actions and associated Completion Times not met.	B.1 Initiate a condition report to document the condition and determine any limitations for the continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.4.6.1	Verify reactor coolant concentration of dissolved gases ≤ 100 std. cc/liter of water at the reactor vessel outlet temperature.	7 days

Figure 3.4.6-1

Limiting Pressure VS Temperature for Control Rod Drive Operation
With 100 STD CC/Liter H_2O



TRM 3.4 REACTOR COOLANT SYSTEM (RCS)

TRM 3.4.7 Reactor Coolant Boron Sampling

TRO 3.4.7 Reactor coolant boron concentration shall be sampled.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirement not met.	A.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
TR 3.4.7.1 Sample reactor coolant boron concentration.	72 hours

TRM 3.4 REACTOR COOLANT SYSTEM (RCS)

TRM 3.4.8 RCS Pressure Isolation Valve (PIV) Leakage

TRO 3.4.8 Integrity of PIVs shall be demonstrated by Technical Specification 3.4.14, "RCS Pressure Isolation Valve (PIV) Leakage."

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirement not met.	--------------------NOTE------------------ These actions are to be performed in addition to any actions required by Technical Specification 3.4.14. ---	
	A.1 Determine and record the integrity of the remaining valve in each high pressure line having a leaking PIV.	24 hours <u>AND</u> Every 24 hours thereafter
	<u>AND</u>	
	A.2 Record the position of one other valve located in the high pressure piping.	24 hours <u>AND</u> Every 24 hours thereafter

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
None.	

TRM 3.4 REACTOR COOLANT SYSTEM (RCS)

TRM 3.4.9 Pressurizer Heaters

TRO 3.4.9 A minimum of 126 kW of Engineered Safeguards (ES) powered pressurizer heaters shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ES power not available to required pressurizer heaters.	A.1 Enter the appropriate Condition of Technical Specification 3.4.9, "Pressurizer"	Immediately
	AND	
	A.2 Initiate a condition report to document the condition and determine any limitations for operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.4.9.1	Verify power available for all required emergency-powered pressurizer heaters.	24 hours

TRM 3.4 REACTOR COOLANT SYSTEM (RCS)

TRM 3.4.10 Gamma Isotopic Analysis

TRO 3.4.10 Gamma isotopic analysis shall be performed on reactor coolant samples.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirement not met.	A.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
TR 3.4.10.1 Perform gamma isotopic analysis on reactor coolant sample.	14 days

TRM 3.4 REACTOR COOLANT SYSTEM (RCS)

TRM 3.4.11 Decay Heat Removal (DHR) Relief Valves

TRO 3.4.11 The relief valve settings for the DHR system shall be ≤ 450 psig.

APPLICABILITY: All MODES.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
None.	

TRM 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

TRM 3.5.1 Makeup and Chemical Addition Systems

TRO 3.5.1 The Makeup and Chemical Addition System shall be OPERABLE with the following requirements:

a. Two makeup pumps shall be OPERABLE except as specified in TS 3.5.2, “Emergency Core Cooling Systems (ECCS) - Operating,” and TS 3.5.3, “Emergency Core Cooling Systems (ECCS) - Shutdown,”

b. The boric acid addition tank (BAAT) shall be OPERABLE, containing at least the equivalent of the boric acid volume and concentration requirements of TRM Figure 3.5.1-1, “Boric Acid Addition Tank Volume and Concentration Vs RCS Average Temperature” as boric acid solution with a temperature of ≥ 10°F above the crystallization temperature for the concentration in the tank, and

c. One boric acid pump associated with the BAAT shall be OPERABLE.

d. System piping and valves necessary to establish a flow path from the boric acid addition tank to the makeup system shall be OPERABLE and shall have a temperature of ≥ 10°F above the crystallization temperature for the concentration in the tank.

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

ACTIONS

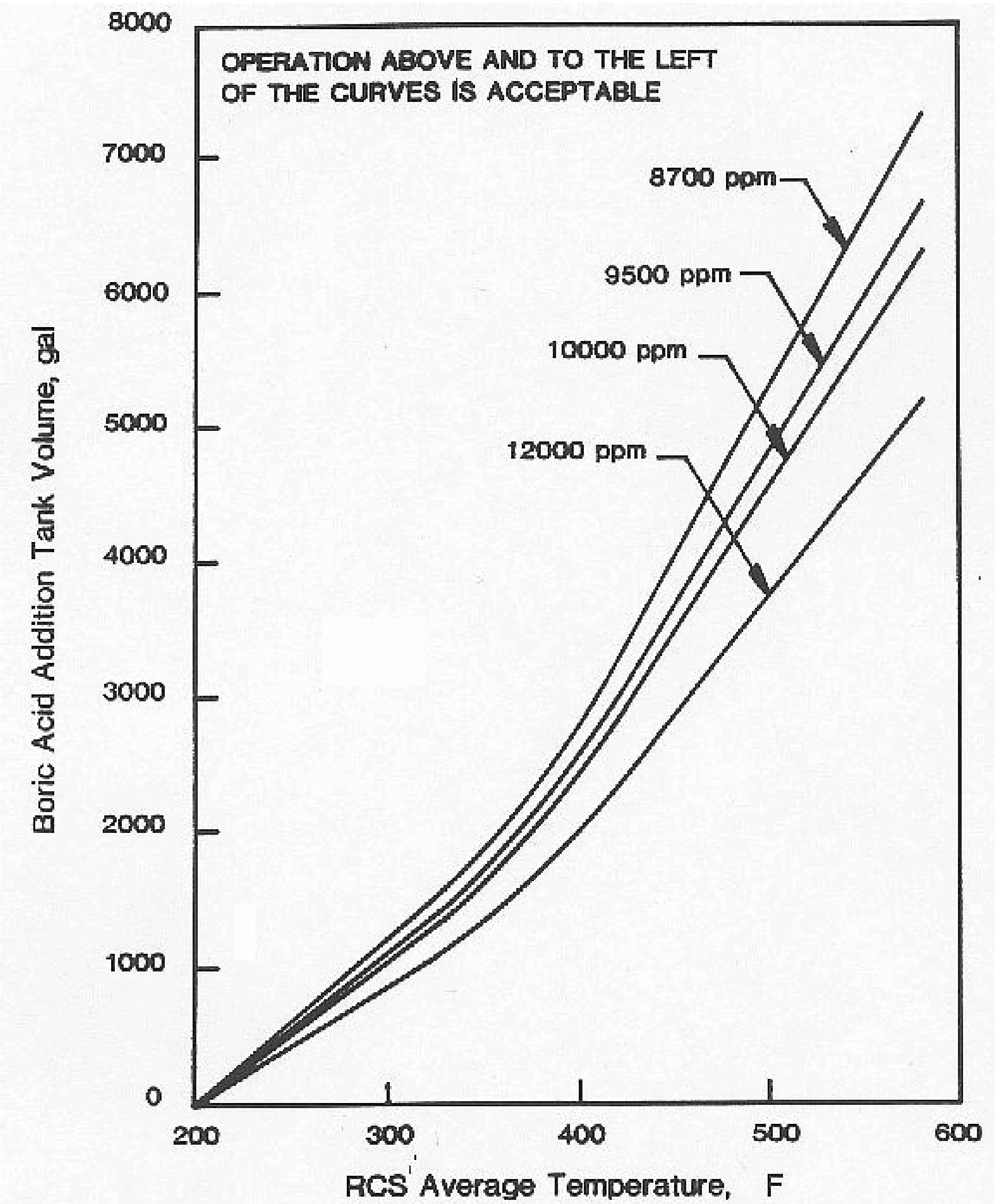
CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of TRO not met.	A.1 Restore Makeup and Chemical Addition System to OPERABLE status.	24 hours
B. Required Action and associated Completion Time not met.	B.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.5.1.1	Perform a CHANNEL CHECK of boric acid addition tank temperature channel.	31 days
TR 3.5.1.2	Perform CHANNEL CALIBRATION of boric acid addition tank temperature channel.	18 months
TR 3.5.1.3	Perform CHANNEL CALIBRATION of boric acid addition tank level channel.	18 months

Figure 3.5.1-1

Boric Acid Addition Tank Volume and Concentration Vs
RCS Average Temperature



TRM 3.6 REACTOR BUILDING SYSTEMS

TRM 3.6.1 Reactor Building Purge Filtration System

TRO 3.6.1 The reactor building purge filtration system shall be OPERABLE.

APPLICABILITY: During movement of irradiated fuel assemblies in the reactor building.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Reactor building purge filtration system inoperable.	A.1 Suspend movement of irradiated fuel assemblies in the reactor building OR A.2 Isolate the reactor building purge system.	Immediately Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.6.1.1	Perform required reactor building purge filtration system filter testing in accordance with the TRM Ventilation Filter Testing Program (TRM VFTP).	In accordance with the TRM VFTP

TRM 3.6 REACTOR BUILDING SYSTEMS

TRM 3.6.2 Reactor Building Spray and Cooling Systems

TRO 3.6.2 Testing required by Technical Specification 3.6.5, " Reactor Building Spray and Cooling Systems," Surveillance Requirement (SR) 3.6.5.5, SR 3.6.5.6, and SR 3.6.5.7 is considered satisfactory if control board indication verifies all components have responded to the actuation signal.

APPLICABILITY: During performance of SR 3.6.5.5, SR 3.6.5.6, or SR 3.6.5.7.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirement not met.	A.1 Initiate a condition report documenting the condition and determine any limitations for operation.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
None.	

TRM 3.6 REACTOR BUILDING SYSTEMS

TRM 3.6.3 Hydrogen Recombiners

TRO 3.6.3 Two hydrogen recombiners shall be OPERABLE.

--NOTE--
The requirements of TRM 3.6.3 supplement the requirements of Technical Specification 3.6.7, "Hydrogen Recombiners."

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirement not met.	A.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.6.3.1	Perform CHANNEL CALIBRATION of all recombiner instrumentation and control circuits.	18 months

TRM 3.6 REACTOR BUILDING SYSTEMS

TRM 3.6.4 Flow Limiting Annulus

TRO 3.6.4 The flow limiting annulus on the main feedwater line at the reactor building penetration shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirement not met.	A.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
TR 3.6.4.1 Verify, at normal operating conditions, that a gap of at least 0.025 inches exists between the pipe and the annulus.	5 years

TRM 3.7 PLANT SYSTEMS

TRM 3.7.2 Spent Fuel Pool

TRO 3.7.2 Loads in excess of 2000 pounds shall be prohibited from travel over fuel assemblies in the storage pool.

APPLICABILITY: All MODES.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
None.	

TRM 3.7 PLANT SYSTEMS

TRM 3.7.3 Spent Fuel Pool (SFP) - MODE 6

TRO 3.7.3 During full core offload, the heat load in the SFP shall remain within the limits specified in Figure 3.7.3-1.

APPLICABILITY: During movement of irradiated fuel between the reactor pressure vessel and the SFP.

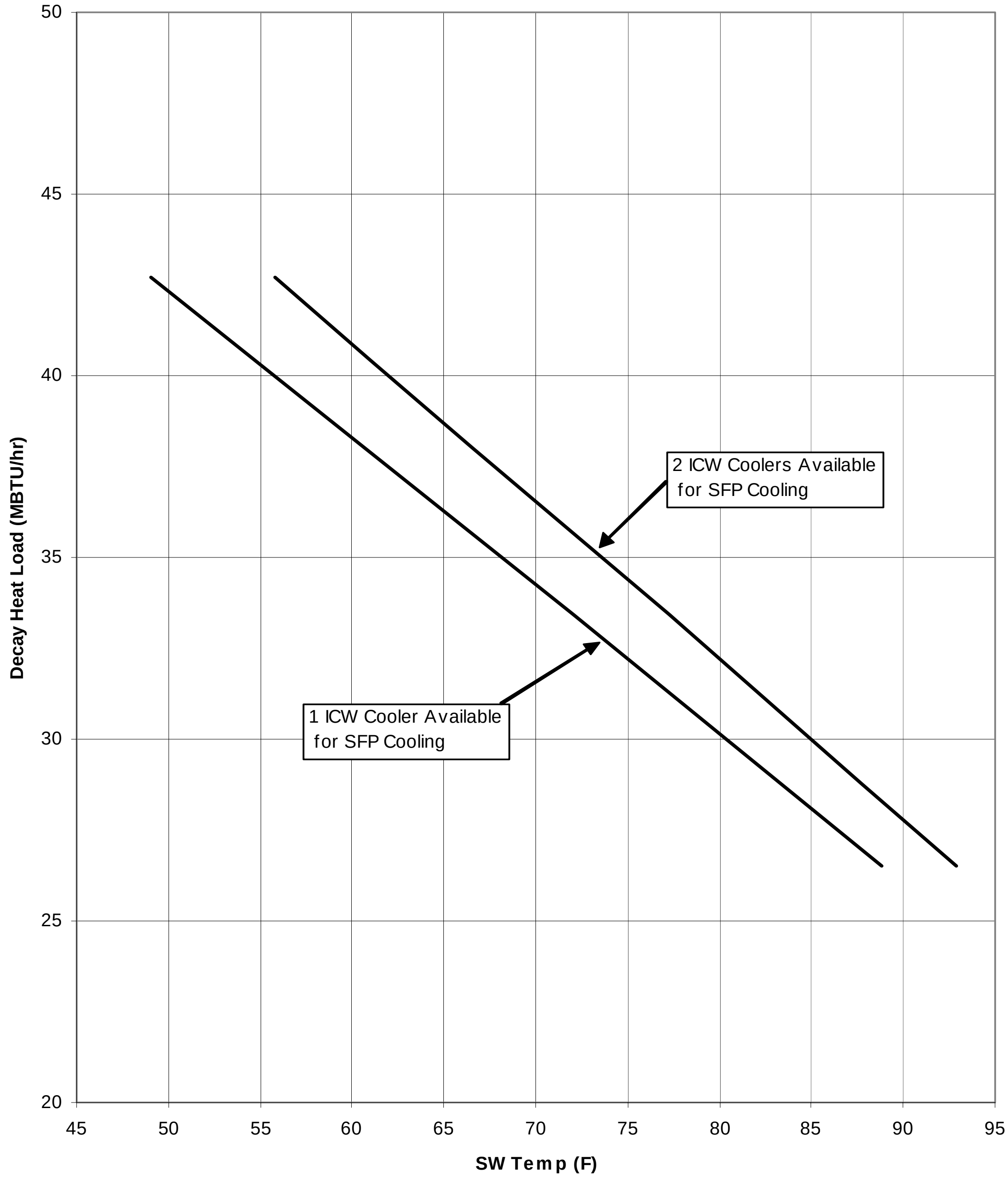
ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TRO not met.	A.1 Suspend transfer of irradiated fuel to the SFP.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	The sum of the total heat load to be transferred to the SFP plus the existing SFP heat load shall be determined to be less than the limits specified in Figure 3.7.3-1.	Prior to and during each full core offload.

Figure 3.7.3-1
Spent Fuel Cooling Capacity



Note: 2 SFP Cooling Heat Exchangers and Pumps are required for full core offload

TRM 3.7 PLANT SYSTEMS

TRM 3.7.4 Radioactive Materials Sources

TRO 3.7.4 Leakage from byproduct, source, and special nuclear radioactive material sources shall be < 0.005 μCi of removable contamination.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TRO not met.	A.1 Withdraw source from service	Immediately
	AND	
	A.2.1 Initiate actions to decontaminate and repair source	Immediately
	OR	
	A.2.2 Initiate action to dispose of source in accordance with Commission regulations.	Immediately

TEST REQUIREMENTS

--NOTES--

1. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State.

2. Leak tests not required for sealed sources containing ≤ 100 μCi of beta and/or gamma emitting material or ≤ 5 μCi of alpha emitting material.

3. Source leakage tests shall be capable of detecting the presence of 0.005 μCi of radioactive material on the test sample.

SURVEILLANCE		FREQUENCY
TR 3.7.4.1	-------------------------------NOTES---------------------------- 1. Not applicable to startup sources subject to core flux. 2. Not applicable to sealed sources containing Hydrogen 3. 3. Not applicable to the boronometer source. 4. Not applicable to sealed sources that are stored and not being used. -- Each sealed source containing radioactive material with a half-life greater than 30 days and in any form other than gas shall be tested for leakage and/or contamination.	6 months
TR 3.7.4.2	Sealed sources that are stored and not in use shall be tested for leakage.	Within 6 months prior to any use or transfer to another user

TEST REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
TR 3.7.4.3	Each sealed startup source shall be leak tested.	Within 31 days prior to being subjected to core flux <u>AND</u> Following repair or maintenance to the source
TR 3.7.4.4	The boronometer source shall be leak tested.	18 months

TRM 3.7 PLANT SYSTEMS

TRM 3.7.5 Shock Suppressors (Snubbers)

TRO 3.7.5 Shock suppressors (Snubbers) shall be OPERABLE.

--NOTE--
Not applicable to snubbers installed on nonsafety-related systems, provided their failure or failure of the system on which they are installed would have no adverse effect on any safety-related system.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required snubbers inoperable.	A.1 Perform an engineering evaluation of the attached components per TRM 5.5.1, “Snubber Inspection Program”	72 hours
	AND	
	A.2.1 Replace or restore the inoperable snubber(s) to OPERABLE status	72 hours
	OR	
	A.2.2 Perform a review and evaluation which justifies continued operation with the inoperable snubber(s)	72 hours
	OR	
	A.3 Declare the attached system inoperable and enter the appropriate Technical Specification for that system.	72 hours

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.7.5.1	Perform visual inspections of snubbers in accordance with the TRM 5.5.1, "Snubber Inspection Program."	In accordance with the TRM 5.5.1, "Snubber Inspection Program"
TR 3.7.5.2	Perform functional tests on snubbers in accordance with TRM 5.5.1, "Snubber Inspection Program."	In accordance with the TRM 5.5.1, "Snubber Inspection Program"

TRM 3.7 PLANT SYSTEMS

TRM 3.7.6 Spent Fuel Cooling System

TRO 3.7.6 The Spent Fuel Cooling System shall be OPERABLE.

APPLICABILITY: Whenever irradiated fuel is stored in the Spent Fuel Pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirement not met.	A.1 Initiate a condition report to document the condition and determine any limitations for continued operation.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
TR 3.7.6.1 Perform functioning test.	18 months

TRM 3.7 PLANT SYSTEMS

TRM 3.7.7 Secondary Coolant Gross Radioiodine Concentration

TRO 3.7.7 The secondary coolant shall be sampled for gross radioiodine concentration.

APPLICABILITY: MODES 1, 2, 3
MODE 4 when generating steam in any steam generator.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirement not met.	A.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
TR 3.7.7.1 Sample secondary coolant gross radioiodine concentration.	7 days <u>AND</u> When primary to secondary leakrate increases by a factor of two

TRM 3.7 PLANT SYSTEMS

TRM 3.7.8 Spent Fuel Pool Boron Concentration

TRO 3.7.8 The Spent Fuel Pool boron concentration shall be sampled after each makeup.

APPLICABILITY: When fuel is stored in the Spent Fuel Pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirement not met.	A.1 Initiate a condition report to document the condition and determine any limitations for continued operation.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.7.8.1	-------------------------------NOTE------------------------------ Must be performed prior to transferring fuel to the Spent Fuel Pool. -- Sample Spent Fuel Pool Boron.	After each makeup

TRM 3.8 ELECTRICAL POWER SYSTEMS

TRM 3.8.1 Switchyard DC Sources

TRO 3.8.1 At least 2 of 3 DC control power sources to the 125VDC switchyard distribution system shall be operable.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Two DC control power sources from the plant to the switchyard inoperable.	A.1 Restore one DC control power source to operable status.	8 hours
B. Required Action and associated Completion Time not met OR Three DC control power sources from the plant to the switchyard inoperable.	B.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.8.1.1	Verify battery terminal voltage is ≥ 124.7 V on float charge.	7 days
TR 3.8.1.2	Verify battery capacity is adequate to supply, and maintain in operable status, the required emergency loads for the design duty cycle when subjected to either a battery service test or a modified performance discharge test.	18 months
TR 3.8.1.3	Verify battery capacity is ≥ 80% of the manufacturers rating when subjected to a performance discharge test or a modified performance discharge test.	60 months AND 24 months when battery has reached 85% of the service life with capacity ≥ 100% of manufacturers rating AND 12 months when battery shows degradation or has reached 85% of the service life and capacity is < 100% of manufacturer's rating

TRM 3.8 ELECTRICAL POWER SYSTEMS

TRM 3.8.2 Switchyard Battery Cell Parameters

TRO 3.8.2 Switchyard battery cell parameters shall be within limits.

APPLICABILITY: When DC control power sources to the 125VDC switchyard distribution system are required to be OPERABLE.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more battery cell parameters not within TRM Table 3.8.2-1 Category A or B limits.	A.1 Verify pilot cell electrolyte level and float voltage meet TRM Table 3.8.2-1 Category C limits	1 hour
	<u>AND</u>	
	A.2 Verify battery cell parameters meet TRM Table 3.8.2-1 Category C limits	24 hours <u>AND</u> Once per 7 days thereafter
	<u>AND</u>	
	A.3 Restore battery cell parameters to TRM Table 3.8.2-1 Category A and B limits.	31 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met <u>OR</u> Average electrolyte temperature of representative cells < 60°F <u>OR</u> One or more battery cell parameters not within TRM Table 3.8.2-1 Category C limits.	B.1 Declare the switchyard battery inoperable.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.8.2.1	Verify battery cell parameters meet TRM Table 3.8.2-1 Category A limits.	7 days
TR 3.8.2.2	Verify battery cell parameters meet TRM Table 3.8.2-1 Category B limits.	92 days AND Once within 24 hours after a battery discharge to < 110 V AND Once within 24 hours after a battery overcharge to> 145 V
TR 3.8.2.3	Verify average electrolyte temperature of representative cells is ≥ 60°F.	92 days

Table 3.8.2-1

Battery Cell Test Requirements

PARAMETER	CATEGORY A: LIMITS FOR EACH DESIGNATED PILOT CELL	CATEGORY B: LIMITS FOR EACH CONNECTED CELL	CATEGORY C: ALLOWABLE LIMITS FOR EACH CONNECTED CELL
Electrolyte Level	> Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark[a]	> Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark[a]	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 V	≥ 2.13 V	> 2.07 V
Specific Gravity[b][c]	≥ 1.195	≥ 1.190 AND Average of all connected cells > 1.195	Not more than 0.020 below average connected cells AND Average of all connected cells ≥ 1.190

(a) It is acceptable for the electrolyte level to temporarily increase above the specified maximum during equalizing charges provided it is not overflowing.

(b) Corrected for electrolyte temperature.

(c) A battery charging current of < 2 amps when on float charge is acceptable for meeting specific gravity limits following a battery recharge, for a maximum of 7 days. When charging current is used to satisfy specific gravity requirements, specific gravity of each connected cell shall be measured prior to expiration of the 7 day allowance.

TRM 3.8 ELECTRICAL POWER SYSTEMS

TRM 3.8.3 Diesel Generator (DG) Testing

TRO 3.8.3 Each DG shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Manual start of DG not performed <u>OR</u> Inspection not performed per manufacturer's recommendations.	A.1 Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.8.3.1	Each DG shall be manually started during the performance of Technical Specification Surveillance Requirement 3.8.1.2.	31 days
TR 3.8.3.2	Each diesel generator shall be given an inspection following manufacturer's recommendations for this class of standby service except for the fuel oil filters and turbo filters, which are addressed in TR 3.8.3.3.	24 months
TR 3.8.3.3	-------------------------------NOTE----------------------------- The 25% interval extension provided by TR 3.0.2 is not applicable. --- Replace the diesel generator lube oil filters and turbo filters.	24 months

TRM 3.8 ELECTRICAL POWER SYSTEMS

TRM 3.8.4 Battery Chargers

TRO 3.8.4 Each vital 125 VDC battery charger shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Testing not performed as required.	A.1 Declare affected battery charger(s) inoperable	Immediately
	AND	
	A.2 Enter the applicable Condition of Technical Specification 3.8.3, "DC Sources - Operating."	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.8.4.1	-------------------------------NOTE------------------------------- Not required to be performed for any battery charger which has been loaded while connected to its 125 VDC distribution system for at least 30 minutes during the current quarter. --	
	Connect each battery charger to its 125 VDC distribution system and load for at least 30 minutes.	92 days

TRM 3.8 ELECTRICAL POWER SYSTEMS

TRM 3.8.5 Emergency Lighting

TRO 3.8.5 The emergency lighting system shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Requirement not met.	A.1	Initiate a condition report to document the condition and determine any limitations for continued operation of the plant.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.8.5.1	Verify correct functioning of emergency lighting system.	18 months

TRM 3.9 REFUELING OPERATIONS

TRM 3.9.1 Fuel Handling - Reactor Building

TRO 3.9.1 Radiation levels shall be monitored by RE-8017.

APPLICABILITY: During movement of fuel assemblies within the reactor building.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RE-8017 inoperable.	A.1 Monitor area with portable survey instrument of appropriate range and sensitivity.	Immediately
B. Required Action and associated Completion Time not met.	B.1 Cease movement of fuel into reactor core <u>AND</u> B.2 Cease activities that might increase the reactivity of the core.	Immediately Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
None.	

TRM 3.9 REFUELING OPERATIONS

TRM 3.9.2 Fuel Handling - Auxiliary Building

TRO 3.9.2 Handling of fuel assemblies shall be subject to:

a. Radiation levels shall be monitored by RE-8009, and

b. No tornado watches shall be in effect for Pope, Yell, Johnson, or Logan counties in Arkansas.

APPLICABILITY: During movement of any fuel assemblies within the auxiliary building.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. RE-8009 inoperable.	A.1	Monitor area with portable survey instrument of appropriate range and sensitivity.	Immediately
B. Tornado watch issued for Pope, Yell, Johnson, or Logan counties.	B.1	---------------NOTE------------- Fuel handling operations in progress will be completed to the extent necessary to place the fuel handling bridge and crane in their normal parked and locked position. ------------------------------------	
		Cease all fuel handling in the auxiliary building.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
None.	

TRM 3.9 REFUELING OPERATIONS

TRM 3.9.3 Irradiated Fuel Handling - Reactor Building

TRO 3.9.3 Handling of irradiated fuel shall be subject to the following:

a. Irradiated fuel shall not be removed from the reactor until the unit has been subcritical for ≥ 100 hours, and

b. A minimum of 10 feet separation shall be maintained between fuel assemblies when two assemblies are moved simultaneously in the fuel transfer canal.

APPLICABILITY: During movement of irradiated fuel assemblies in the reactor building.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TRO not met.	A.1 Suspend fuel movement in the reactor building.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
None.	

TRM 3.9 REFUELING OPERATIONS

TRM 3.9.4 Communications

TRO 3.9.4 Direct communications between the control room and the refueling personnel in the reactor building shall exist.

APPLICABILITY: During movement of irradiated fuel assemblies in the reactor building.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TRO not met.	A.1 Suspend fuel movement in the reactor building.	Immediately

TEST REQUIREMENTS

SURVEILLANCE	FREQUENCY
None.	

TRM 3.9 REFUELING OPERATIONS

TRM 3.9.5 Refueling System Interlocks

TRO 3.9.5 Refueling System interlocks shall be OPERABLE.

APPLICABILITY: During handling of irradiated fuel in the reactor building.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirement not met.	A.1 Initiate a condition report to document the condition and determine any limitations for continued operations.	Immediately

TEST REQUIREMENTS

SURVEILLANCE		FREQUENCY
TR 3.9.5.1	---------------------------------NOTE------------------------------ Must be performed at the start of each refueling shutdown. -- Perform functioning test of interlocks.	18 months

4.0 DESIGN FEATURES

4.1 Site Location

None.

4.0 DESIGN FEATURES

4.2 Reactor Coolant System (RCS)

4.2.1 The reactor coolant volume is less than 12,200 cubic feet.

4.0 DESIGN FEATURES

4.3 Fuel Storage

4.3.1 Criticality

4.3.1.1 The ten interior storage cells specified in Technical Specification 4.3.1.2.e, shall be physically blocked prior to any storage in the fresh fuel rack.

5.0 ADMINISTRATIVE CONTROLS

5.5 Programs and Manuals

The following programs shall be established, implemented and maintained.

5.5.1 Snubber Inspection Program

This program provides controls to assure adequate shock suppression protection for primary coolant system piping and any other safety related system or component under dynamic loads as might occur during an earthquake or severe transient, while allowing normal thermal motion during startup and shutdown. This is done by assuring the operability of those shock suppressors installed for that purpose.

The following surveillance requirements apply to all applicable shock suppressors.

a. Inspection Types

As used in this specification, type of snubber shall mean snubbers of the same design and manufacturer, irrespective of capacity.

b. Visual Inspections

Snubbers may be categorized as inaccessible or accessible during reactor operation. Each of these categories (inaccessible and accessible) may be inspected independently according to the schedule determined by Table 5.5.1-1. The visual inspection interval for each category of snubber shall be determined based upon the criteria provided in Table 5.5.1-1.

c. Visual Inspection Acceptance Criteria

Visual inspections shall verify (1) that there are no visible indications of damage or impaired operability, and (2) attachments to the foundation or supporting structure are functional and (3) fasteners for the attachment of the snubber to the component and to the snubber anchorage are functional. Snubbers which appear inoperable as a result of visual inspections shall be classified as INOPERABLE and may be reclassified OPERABLE 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 operable per Specifications 5.5.1.d or 5.5.1.e, as applicable. However, when the fluid port of a hydraulic snubber is found to be uncovered, the snubber

5.0 ADMINISTRATIVE CONTROLS

5.5 Programs and Manuals

5.5.1 Snubber Inspection Program (continued)

shall be determined inoperable and cannot be determined operable via functional testing for the purpose of establishing the next visual inspection interval. All snubbers connected to a common hydraulic fluid reservoir shall be evaluated for operability if any snubber connected to that reservoir is determined to be inoperable.

d. Functional Tests

At least once each refueling shutdown a representative sample of snubbers shall be tested using the following sample plan.

At least 10% of the snubbers required by TRM 3.7.5 shall be functionally tested either in place or in a bench test. For each snubber that does not meet the functional test acceptance criteria of Specification 5.5.1.e, an additional 10% of the snubbers shall be functionally tested until no more failures are found or until all snubbers have been functionally tested.

The representative samples for the functional test sample plans shall be randomly selected from the snubbers required by TRM 3.7.5 and reviewed before beginning the testing. The review shall ensure as far as practical that they are representative of the various configurations, operating environments, range of sizes, and capacities. Snubbers placed in the same locations as snubbers which failed the previous functional test shall be retested at the time of the next functional test but shall not be included in the sample plan. If during the functional testing, additional sampling is required due to failure of only one type of snubber, the functional testing results shall be reviewed at that time to determine if additional samples should be limited to the type of snubber which has failed the functional testing.

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 rate where required, is present in both tension and compression, within the specified range;

5.0 ADMINISTRATIVE CONTROLS

5.5 Programs and Manuals

5.5.1 Snubber Inspection Program (continued)

e. Functional Test Acceptance Criteria (continued)

3. Where required, the force required to initiate or maintain motion of the snubber is within the specified range in both direction of travel; and

4. For snubbers specifically required not to displace under continuous load, the ability of the snubber to withstand load without displacement.

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

An evaluation shall be made of each failure to meet the functional test acceptance criteria to determine the cause of the failure. The results of this evaluation shall be used, if applicable, in selecting snubbers to be tested in an effort to determine the operability of other snubbers irrespective of type which may be subject to the same failure mode.

For the snubbers found inoperable, an engineering evaluation shall be performed on the components to which the inoperable snubbers are attached. The purpose of this engineering evaluation shall be to determine if the components to which the inoperable snubbers are attached were adversely affected by the inoperability of the snubbers in order to ensure that the component remains capable of meeting the designed service.

If any snubber selected for functional testing either fails to activate or fails to move, i.e., frozen-in-place, the cause will be evaluated and, if caused by manufacturer or design deficiency, all snubbers of the same type subject to the same defect shall be evaluated in a manner to ensure their operability. This testing requirement shall be independent of the requirements stated in 5.5.1.d for snubbers not meeting the functional test acceptance criteria.

5.0 ADMINISTRATIVE CONTROLS

5.5 Programs and Manuals

5.5.1 Snubber Inspection Program (continued)

g. Preservice Testing of Repaired, Replacement and New Snubbers

Preservice operability testing shall be performed on repaired, replacement or new snubbers prior to installation. Testing may be at the manufacturer's facility. The testing shall verify the functional test acceptance criteria in 5.5.1.e.

In addition, a preservice inspection shall be performed on each repaired, replacement or new snubber and shall verify that:

1. there are no visible signs of damage or impaired operability as a result of storage, handling or installation;

2. the snubber load rating, location, orientation, position setting and configuration (attachments, extensions, etc.), are in accordance with design;

3. adequate swing clearance is provided to allow snubber movement;

4. if applicable, fluid is at the recommended level and fluid is not leaking from the snubber system; and

5. structural connections such as pins, bearings, studs, fasteners and other connecting hardware such as lock nuts, tabs, wire and cotter pins are installed correctly.

h. Snubber Seal Replacement Program

The seal service life of hydraulic snubbers shall be monitored to ensure that the service life is not exceeded between surveillance inspections. The expected service life for the various seals, seal materials, and applications shall be determined and established based on engineering information and the seals shall be replaced so that the expected service life will not be exceeded during a period when the snubber is required to be operable. The seal replacements shall be documented and the documentation shall be retained in accordance with the Quality Assurance Program Manual (QAPM).

TABLE 5.5.1-1

Snubber Visual Inspection Interval

NUMBER OF INOPERABLE SNUBBERS

Population per Category (Notes 1 and 2)	Column A Extend 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 category shall be determined based upon the previous inspection interval and the number of INOPERABLE 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, categories must be determined and documented before any inspection and that determination shall be the basis upon which to determine the next inspection interval for that category.

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

TABLE 5.5.1-1 (continued)

Note 3: If the number of INOPERABLE 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 INOPERABLE 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 INOPERABLE 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 INOPERABLE 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 INOPERABLE snubbers found during the previous interval and the number in Column B to the difference in the numbers in Column B and C.

Note 6: Specified surveillance intervals may be adjusted plus or minus 25 percent to accommodate normal test and surveillance schedule intervals up to and including 48 months, with the exception that inspection of inaccessible snubbers may be deferred to the next shutdown when plant conditions allow five days for inspection. See Note 7 for definition of interval as applied to snubber visual inspections.

Note 7: Interval as defined for the shock suppressors (snubbers) visual inspection surveillance requirements is the period of time starting when the unit went into cold shutdown for refueling, and ending when the unit goes into cold shutdown for its next scheduled refueling. This period of time is nominally considered to be an 18 month period, or a 24 month period based on the type of fuel being used. However, the period of time (interval) could be shorter or longer due to plant operating variables such as fuel life and operating performance.

5.5 Programs and Manuals

5.5.2 Ventilation Filter Testing Program

A program shall be established to implement the following required testing of reactor building purge filtration system filters.

a. Within 720 operating hours prior to initial fuel handling operations:

1. the pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 6 inches of water at system design flowrate (± 10%),

2. the results of the in-place cold DOP and halogenated hydrocarbon tests at design flow rates (± 10%) on HEPA filters and charcoal adsorbers banks shall show ≥ 99% DOP removal and ≥ 99% halogenated hydrocarbon removal,

3. the results of laboratory carbon sample analysis shall show ≥ 90% radioactive methyl iodide removal at a velocity within ± 20% of system design, 0.05 to 0.15 mg/m^3 inlet methyl iodide concentration, ≥ 70% R. H. and ≥ 125°F, and

4. Fans shall be shown to operate within ± 10% design flow.

b. Initially and after any maintenance or testing that could affect the air distribution within the reactor building purge system, air distribution shall be demonstrated to be uniform within ± 20% across HEPA filters and charcoal adsorbers.

c. Prior to irradiated fuel handling in the reactor building following significant painting, fire, or chemical release in any ventilation zone communicating with the system,

1. the results of the in-place cold DOP and halogenated hydrocarbon tests at design flow rates (± 10%) on HEPA filters and charcoal adsorber banks shall show ≥ 99% DOP removal and ≥ 99% halogenated hydrocarbon removal,

2. the results of laboratory carbon sample analysis shall show ≥ 90% radioactive methyl iodide removal at a velocity within ± 20% of system design, 0.05 to 0.15 mg/m^3 inlet methyl iodide concentration, ≥ 70% R. H. and ≥ 125°F, and

3. Fans shall be shown to operate within ± 10% design flow.

5.5 Programs and Manuals

5.5.2 Ventilation Filter Testing Program (continued)

d. Prior to irradiated fuel handling in the reactor building after each complete or partial replacement of a HEPA filter bank,

   1. the results of the in-place cold DOP at design flow rates (± 10%) on HEPA filters and charcoal adsorber banks shall show ≥ 99% DOP removal.

e. Prior to irradiated fuel handling in the reactor building after each complete or partial replacement of a charcoal adsorber bank,

   1. the results of the in-place halogenated hydrocarbon tests at design flow rates (± 10%) on HEPA filters and charcoal adsorber banks shall show ≥ 99% halogenated hydrocarbon removal.

f. Prior to irradiated fuel handling in the reactor building after any structural maintenance on the system housing,

   1. the results of the in-place cold DOP and halogenated hydrocarbon tests at design flow rates (± 10%) on HEPA filters and charcoal adsorber banks shall show ≥ 99% DOP removal and ≥ 99% halogenated hydrocarbon removal.

5.0 ADMINISTRATIVE CONTROLS

5.6 Reporting Requirements

5.6.1 Startup Report

A summary report of plant startup and power escalation testing shall be submitted following 1) receipt of an operating license, 2) amendment to the license involving a planned increase in power level, 3) installation of fuel that has a different design or has been manufactured by a different fuel supplier, and 4) modifications that may have significantly altered the nuclear, thermal, or hydraulic performance of the plant. The report shall address each of the tests identified in the FSAR and shall in general include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in license conditions based on other commitments shall be included in this report.

Startup reports shall be submitted within 1) 90 days following completion of the startup test program, 2) 90 days following resumption or commencement of commercial power operation, or 3) 9 months following initial criticality, whichever is earliest. If the Startup Report does not cover all three events (i.e., initial criticality, completion of startup test program, and resumption or commencement of commercial power operation), supplementary reports shall be submitted at least every three months until all three events have been completed.

TRM B 3.0 TECHNICAL REQUIREMENT FOR OPERATION (TRO) APPLICABILITY

BASES

TROs	Establish the general requirements applicable to Technical Requirements for Operation.
TRO 3.0.1	Establishes the Applicability statement within each individual Requirement as the requirement for when (i.e., in which operational MODES or other specified conditions) conformance to the TRO is required to be met.
TRO 3.0.2	Establishes that upon discovery of a failure to meet a TRO, the associated Required Actions shall be met. The Completion Time of each Required Action for a Condition is applicable from the point in time that a Condition is entered. The Required Actions establish those remedial measures that must be taken within specified Completion Times when the requirements of a TRO are not met. This specification establishes that (1) implementation of the Required Action within the specified time interval constitutes compliance with a TRO and, (2) completion of the remedial measures of the Required Action is not required when compliance with a TRO is restored within the Completion Time specified in the associated Required Action or the TRO is no longer applicable, unless otherwise specified. When a change in MODE or other specified condition is required to comply with Required Actions, the unit may enter a MODE or other specified condition in which another TRO becomes applicable. In this case, the Completion Times of the associated Required Actions would apply from the point in time that the new TRO becomes applicable and the Condition(s) is entered.
TRO 3.0.3	Establishes the Required Actions that must be implemented when a TRO is not met and the condition is not specifically addressed by the associated Conditions. It is not intended to be used as an operational convenience that permits routine voluntary removal of redundant systems or components from service in lieu of other alternatives that would not result in redundant systems or components being inoperable. This requirement is intended to provide assurance that plant management is aware of the condition and to ensure that the condition is evaluated for its affect on continued operation of the plant.
TRO 3.0.4	Establishes limitations on changes in MODE or other specified conditions when a TRO is not met. It precludes placing the facility in a MODE or other specified condition when the requirements for a TRO are not met and the corrective action process has determined that limitations should be placed on continued plant operation.

BASES

TRO 3.0.4 (continued)

Compliance with Required Actions that permit continued operation of the unit for an unlimited period of time in a MODE or other specified condition provides an acceptable level of safety for continued operation. This is without regard to the status of the unit before or after the MODE change. Therefore, in such cases, entry into a MODE or other specified condition may be made in accordance with the provisions of the Required Actions. The provisions of this TRO should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components to OPERABLE status before entering an associated MODE or other specified condition.

The provisions of TRO 3.0.4 shall not prevent changes in MODES or other specified conditions that are required to comply with Required Actions or that result from any unit shutdown. The requirements of TRO 3.0.4 do not apply in MODES 5 and 6, or in other specified conditions of the Applicability (unless in MODES 1, 2, 3, or 4) because the Required Actions of individual TROs sufficiently define the remedial measures to be taken.

TRO 3.0.5

Establishes the allowance for restoring equipment to service under administrative controls when it has been removed from service or declared inoperable to comply with Required Actions. The sole purpose of this provision is an exception to TRO 3.0.2 (e.g., to not comply with the applicable Required Actions) to allow the performance of required testing to demonstrate the OPERABILITY of the equipment being returned to service or the OPERABILITY of other equipment. The administrative controls ensure the time the equipment is returned to service in conflict with the requirements of the Required Actions is limited to the time absolutely necessary to perform the required testing to demonstrate OPERABILITY. This provision does not allow time to perform any other preventive or corrective maintenance.

TRM B 3.0 TEST REQUIREMENT (TR) APPLICABILITY

BASES

TRs	Establish the general requirements applicable to Surveillance Requirements.
TR 3.0.1	Establishes the requirement that TRs must be met during the MODES or other specified conditions for which the requirements of the TRO apply unless otherwise stated in an individual TR. The purpose of this requirement is to ensure that TRs are performed to verify the OPERABILITY of systems and components, and that parameters are within specified limits. Failure to meet a TR within the specified Frequency in accordance with TR 3.0.2 constitutes a failure to meet a TRO. TRs do not have to be performed when the facility is in a MODE or other specified condition for which the requirements of the associated TRO are not applicable, unless otherwise specified. TRs, including TRs invoked by Required Actions, do not have to be performed on inoperable equipment because the Required Actions define the remedial measures that apply.
TR 3.0.2	Establishes a 25% limit for which the specified time interval for TRs may be extended. It permits an allowable extension of the normal test interval to facilitate test scheduling and consideration of plant operating conditions that may not be suitable for conducting the test; e.g., transient conditions or other ongoing surveillance or maintenance activities. It also provides flexibility to accommodate the length of a fuel cycle for tests that are performed at each refueling outage and are specified with an 18-month Frequency. It is not intended that this provision be used repeatedly as an operational convenience to extend test intervals beyond that specified for tests that are not performed during refueling outages. The limitation of TR 3.0.2 is based on engineering judgement and the recognition that the most probable result of any particular test being performed is the verification of conformance with the TR. This provision is sufficient to ensure that the reliability ensured through test activities is not significantly degraded beyond that obtained from the specified test intervals.
TR 3.0.3	Establishes the flexibility to defer declaring affected equipment inoperable or an affected variable outside the specified limits when a TR has not been completed within the specified Frequency. A delay period of up to 24 hours or up to the limit of the specified Frequency, whichever is greater, applies from the point in time that it is discovered that the TR has not been performed in accordance with TR 3.0.2, and not at the time that the specified Frequency was not met. This delay period provides an adequate time to complete TRs that have been missed. This delay period permits the completion of a TR before complying with Required Actions or other remedial measures that might preclude completion of the TR.

BASES

TR 3.0.3 (continued)

The basis for this delay period includes consideration of unit conditions, adequate planning, availability of personnel, the time required to perform the TR, the safety significance of the delay in completing the required TR, and the recognition that the most probable result of any particular TR being performed is the verification of conformance with the requirements.

When a TR with a Frequency based not on time intervals, but upon specified unit conditions, operational situations, or requirements of regulations (e.g., prior to entering MODE 1 after each fuel loading, or in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, etc.) is discovered to not have been performed when specified, TR 3.0.3 allows the full delay period of up to the specified Frequency to perform the TR. However, since there is not a time interval specified, the missed TR should be performed at the first reasonable opportunity.

TR 3.0.3 provides a time limit for, and allowances for the performance of, TRs that become applicable as a consequence of MODE changes imposed by Required Actions.

Failure to comply with specified Frequencies for TRs is expected to be an infrequent occurrence. Use of the delay period established by TR 3.0.3 is a flexibility which is not intended to be used as an operational convenience to extend specified Frequencies. While up to 24 hours or the limit of the specified Frequency is provided to perform the missed TR, it is expected that the missed TR will be performed at the first reasonable opportunity. The determination of the first reasonable opportunity should include consideration of the impact on plant risk (from delaying the TR as well as any plant configuration changes required or shutting the plant down to perform the TR) and impact on any analysis assumptions, in addition to unit conditions, planning, availability of personnel, and the time required to perform the TR. This risk impact should be managed through the program in place to implement 10 CFR 50.65(a)(4) and its implementation guidance, NRC Regulatory Guide 1.182, 'Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants.' This Regulatory Guide addresses consideration of temporary and aggregate risk impacts, determination of risk management action thresholds, and risk management action up to and including plant shutdown. The missed TR should be treated as an emergent condition as discussed in the Regulatory Guide. The risk evaluation may use quantitative, qualitative, or blended methods. The degree of depth and rigor of the evaluation should be commensurate with the importance of the component. Missed TRs for important components should be analyzed quantitatively. If the results of the risk evaluation determine the risk increase is significant, this evaluation should be used to determine the safest course of action. All missed TRs will be placed in the licensee's Corrective Action Program.

BASES

TR 3.0.3 (continued)	If a TR is not completed within the allowed delay period, then the equipment is considered inoperable or the variable is considered outside the specified limits and the Completion Times of the Required Actions for the applicable TRO Conditions begin immediately upon expiration of the delay period. If a TR is failed within the delay period, then the equipment is inoperable, or the variable is outside the specified limits and the Completion Times of the Required Actions for the applicable TRO Conditions begin immediately upon the failure of the TR. Satisfactory completion of the TR within the delay period allowed by TR 3.0.3, or within the Completion Time of the Required Actions, restores compliance with TR 3.0.1.
TR 3.0.4	Establishes the requirement that all applicable tests must be met before entry into a MODE or other condition of operation specified in the TR. The purpose of this TR is to ensure that system and component OPERABILITY requirements or parameter limits are met before entry into a MODE or condition for which these systems and components ensure safe operation of the facility. The provisions of this TR should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components to OPERABLE status before entering an associated MODE or other specified condition in the Applicability. The provisions of TR 3.0.4 shall not prevent entry into MODES or other specified conditions that are required to comply with Required Actions or that result from any unit shutdown. The requirements of TR 3.0.4 do not apply in MODES 5 and 6, or in other specified conditions of the Applicability (unless in MODES 1, 2, 3, or 4) because the Required Actions of individual TROs sufficiently define the remedial measures to be taken.

TRM B 3.3 INSTRUMENTATION

TRM B 3.3.1 Control Room Ventilation Monitors

BASES

BACKGROUND

The operability of the chlorine detection system ensures that sufficient capability is available to promptly detect and initiate protective action in the event of an accidental chlorine release. This capability is required to protect control room personnel and is consistent with the recommendations of Regulatory Guide 1.95, "Protection of Nuclear Power Plant Control Room Operators against an Accidental Chlorine Release," February 1975.

TEST REQUIREMENTS

TR 3.3.1.1

Failures such as blown instrument fuses, defective indicators, faulted amplifiers which result in "upscale" or "downscale" indication can be easily recognized by simple observation of the functioning of an instrument or system. Furthermore, such failures are, in many cases, revealed by alarm or annunciator Action. Comparison of output and/or state of independent channels measuring the same variable supplements this type of built-in surveillance. Based on experience in operation of both conventional and nuclear plant systems, when the plant is in operation, the minimum checking frequency stated is deemed adequate for reactor system instrumentation.

TR 3.3.1.3

Calibration shall be performed to assure the presentation and acquisition of accurate information.

TRM B 3.3 INSTRUMENTATION

TRM B 3.3.2 Seismic Monitoring Instrumentation

BASES

BACKGROUND

The operability of the Seismic Monitoring Instrumentation ensures that sufficient capability is available to promptly determine the magnitude of a seismic event and evaluate the response of 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 facility to determine if plant shutdown is required pursuant to Appendix "A" of 10 CFR Part 100. The instrumentation is consistent with the recommendations of Safety Guide 12, "Instrumentation for Earthquake," published March 19, 1971, and NUREG-0800 Section 3.7.4, "Seismic Instrumentation."

TEST REQUIREMENTS

TR 3.3.2.1

Failures such as blown instrument fuses, defective indicators, faulted amplifiers which result in "upscale" or "downscale" indication can be easily recognized by simple observation of the functioning of an instrument or system. Furthermore, such failures are, in many cases, revealed by alarm or annunciator Action. Comparison of output and/or state of independent channels measuring the same variable supplements this type of built-in surveillance. Based on experience in operation of both conventional and nuclear plant systems, when the plant is in operation, the minimum checking frequency stated is deemed adequate for reactor system instrumentation.

TR 3.3.2.4

Calibration shall be performed to assure the presentation and acquisition of accurate information.

REFERENCES

1. SAR, Section 2.7.6

TRM B 3.3 INSTRUMENTATION

TRM B 3.3.4 Reactor Protection System (RPS) Shutdown Bypass

BASES

BACKGROUND

Each reactor protection channel key operated shutdown bypass switch is provided with alarm and lights to indicate when the shutdown bypass switch is being used.

TRM B 3.3 INSTRUMENTATION

TRM B 3.3.5 Miscellaneous Instrumentation

BASES

TEST REQUIREMENTS

TR 3.3.5.1

Failures such as blown instrument fuses, defective indicators, faulted amplifiers which result in "upscale" or "downscale" indication can be easily recognized by simple observation of the functioning of an instrument or system. Furthermore, such failures are, in many cases, revealed by alarm or annunciator Action. Comparison of output and/or state of independent channels measuring the same variable supplements this type of built-in surveillance. Based on experience in operation of both conventional and nuclear plant systems, when the plant is in operation, the minimum checking frequency stated is deemed adequate for reactor system instrumentation.

Note (c) specifies the requirements for ensuring the incore detectors are functioning properly. Because the incores are inaccurate below 15% Rated Thermal Power (RTP), Note (c) affords a window of opportunity to verify proper functioning of the incores above 15% RTP while ensuring they are verified operable prior to exceeding 20% RTP when they are required to support TS 3.2.4, Quadrant Power Tilt.

TR 3.3.5.3

Calibration shall be performed to assure the presentation and acquisition of accurate information.

TRM B 3.4 REACTOR COOLANT SYSTEMS

TRM B 3.4.1 Reactor Internals Vent Valves

BASES

BACKGROUND

The internals vent valves are provided to relieve the pressure generated by steaming in the core following a LOCA so that the core remains sufficiently covered. Inspection and manual actuation of the internal vent valves (1) ensure operability, (2) ensure that the valves are not open during normal operation, and (3) demonstrate that the valves begin to open and are fully open at the forces equivalent to the differential pressures assumed in the safety analysis.

TRM B 3.4 REACTOR COOLANT SYSTEMS

TRM B 3.4.2 Reactor Coolant System (RCS) Vents

BASES

BACKGROUND

The reactor coolant vents are provided to exhaust noncondensible gases and/or steam from the primary system that could inhibit natural circulation core cooling. The operability of at least one reactor coolant system vent path from the reactor vessel head, the reactor coolant system highpoints, and the pressurizer steam space ensures the capability exists to perform this function. The valve redundancy of the vent paths serves to minimize the probability of inadvertent actuation and breach of reactor coolant pressure boundary while ensuring that a single failure of a vent valve, power supply, or control system does not prevent isolation of the vent path. Testing requirements are covered in Section 4.0 for the class 2 valves and Table 4.1-2 for the vent paths. These are consistent with ASME Section XI and Item II.B.1 of NUREG-0737, "Clarification of TMI Action Plan Requirements," 11/80.

TRM B 3.4 REACTOR COOLANT SYSTEMS

TRM B 3.4.3 Pressurization, Heatup and Cooldown Limitations

BASES

BACKGROUND

All reactor coolant system components are designed to withstand the effects of cyclic loads due to system temperature and pressure changes (Ref. 1). These cyclic loads are introduced by unit load transients, reactor trips, and unit heatup and cooldown operations. The number of thermal and loading cycles used for design purposes are shown in Table 4-8 of the SAR. The maximum unit heatup and cooldown rates satisfy stress limits for cyclic operation (Ref. 2). The 200 psig pressure limit for the secondary side of the steam generator at a temperature less than 100°F satisfies stress levels for temperatures below the DTT (Ref. 3).

The spray temperature difference restriction based on a stress analysis of the spray line nozzle is imposed to maintain the thermal stresses at the pressurizer spray line nozzle below the design limit. Temperature requirements for the steam generator correspond with the measured NDTT for the shell.

REFERENCES

1. SAR, Section 4.1.2.4

2. ASME Boiler and Pressure Code, Section III, N-415

3. SAR, Section 4.3.11.5

TRM B 3.4 REACTOR COOLANT SYSTEMS

TRM B 3.4.4 Reactor Coolant System (RCS) Chemistry

BASES

BACKGROUND

By maintaining the chloride, fluoride, and oxygen concentration in the reactor coolant within the specifications, the integrity of the reactor coolant system is protected against potential stress corrosion attack (Refs. 1 and 2).

The oxygen concentration in the reactor coolant system is normally expected to be below detectable limits since dissolved hydrogen is used when the reactor is critical and a residual of hydrazine is used when the reactor is subcritical to control the oxygen. The requirement that the oxygen concentration not exceed 0.1 ppm is added assurance that stress corrosion cracking will not occur (Ref. 3).

If the oxygen, chloride, or fluoride limits are exceeded, measures can be taken to correct the condition (e.g., switch to the spare demineralizer, replace the ion exchanger resin, increase the hydrogen concentration in the makeup tank, etc.) and further because of the time dependent nature of any adverse effects arising from halogen or oxygen concentrations in excess of the limits, it is unnecessary to shutdown immediately.

TECHNICAL REQUIREMENT FOR OPERATION

The maximum limit of 1 ppm for the oxygen and halogen concentration that will not be exceeded was selected as the hot shutdown limit because these values have been shown to be safe at 500°F (Ref. 4).

ACTIONS

A.1 and A.2

The oxygen and halogen limits specified are at least an order of magnitude below concentrations which could result in damage to materials found in the reactor coolant system even if maintained for an extended period of time (Ref. 3). Thus, the period of eight hours to initiate corrective action and the period of 24 hours thereafter to perform corrective action to restore the concentration within the limits have been established. The eight hour period to initiate corrective action allows time to ascertain that the chemical analyses are correct and to locate the source of contamination.

BASES

ACTIONS (continued)

B.1

If corrective action has not been effective at the end of 24 hours, then a condition report shall be written to document this condition. The corrective action program will be used to determine any limitations for operation of the plant.

REFERENCES

1. SAR Section 4.1.2.7
2. SAR Section 9.2.2
3. Corrosion and Wear Handbook, O.J. DePaul, Editor
4. Stress Corrosion of Metals, Logan

TRM B 3.4 REACTOR COOLANT SYSTEMS

TRM B 3.4.5 Reactor Coolant System (RCS) Operational Leakage

BASES

BACKGROUND

Every reasonable effort will be made to reduce reactor coolant leakage, including evaporative losses (which may be on the order of 0.5 gpm), to prevent a large leak from masking the presence of a smaller leak. Reactor building sump level, water inventory balances, radiation monitoring equipment, boric acid crystalline deposits, and physical inspections can disclose reactor coolant leaks. Any leak of radioactive fluid, whether from the reactor coolant system primary boundary or not can be a serious problem with respect to in-plant radioactive contamination and cleanup or it could develop into a still more serious problem; and therefore, the first indication of such leakage will be followed up as soon as practicable.

Although some leak rates on the order of GPM may be tolerable from a dose point of view, especially if they are to closed systems, it must be recognized that leaks on the order of drops per minute through any of the walls of the primary system could be indicative of materials failure such as by stress corrosion cracking. If depressurization, isolation and/or other safety measures are not taken promptly, these small leaks could develop into much larger leaks, possibly into a gross pipe rupture. Therefore, the nature of the leak, as well as the magnitude of the leakage must be considered in the safety evaluation.

When the source of leakage has been identified, the situation can be evaluated to determine if operation can safely continue. This evaluation will be performed by the Operating Staff and will be documented in writing and approved by the Superintendent.

The upper limit of 30 gpm is based on the contingency of a hypothetical loss of all AC power. A 30 gpm loss of water in conjunction with a hypothetical loss of all AC power and subsequent cooldown of the reactor coolant system by the atmospheric dump system and steam driven emergency feedwater pump would require more than 60 minutes to empty the pressurizer from the combined effect of system leakage and contraction. This will be ample time to restore both electrical power to the station and makeup flow to the reactor coolant system.

TRM B 3.4 REACTOR COOLANT SYSTEMS

TRM B 3.4.6 Control Rod Operation

BASES

BACKGROUND

By maintaining the reactor coolant temperature and pressure as specified above, any dissolved gases in the reactor coolant system are maintained in solution.

Although the dissolved gas concentration is expected to be approximately 20-40 std. cc/liter of water, the dissolved gas concentration is conservatively assumed to be 100 std. cc/liter of water at the reactor vessel outlet temperature.

The limiting pressure versus temperature curve for dissolved gases is determined by the equilibrium pressure versus temperature curve for the dissolved gas concentration of 100 std. cc/liter of water. The equilibrium total pressure is the sum of the partial pressure of the dissolved gases plus the partial pressure of water at a given temperature. The margin of error consists of the maximum pressure difference between the pressure sensing tap and lowest pressure point in the system, the maximum pressure gage error, and the pressure difference due to the maximum temperature gage error.

If either the maximum dissolved gas concentration (100 std. cc/liter of water) is exceeded or the operating pressure falls below the limiting pressure versus temperature curve, the vessel level instrument vent should be checked for accumulation of undissolved gases.

Control Rod operation could be hampered when the above limits are exceeded. Continued operation of the Safety and Regulating Control Rods should be evaluated under the corrective action program. Because the Axial Power Shaping Rods (APSRs) are not required to ensure adequate Shutdown Margin following a reactor trip, continued operation of the APSRs is permitted unless otherwise directed by plant management.

TRM B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

TRM B 3.5.1 Makeup and Chemical Addition Systems

BASES

BACKGROUND

The makeup system and chemical addition system provide control of the reactor coolant system boron concentration (Ref. 1). This is normally accomplished by using any of the three makeup pumps in series with a boric acid pump associated with the boric acid addition tank. The alternate method of boration will be the use of the makeup pumps taking suction directly from the borated water storage tank (Ref. 2).

The quantity of boric acid in storage from either of the two above mentioned sources is sufficient to borate the reactor coolant system to a 1% subcritical margin in the cold condition (200°F) at the worst time in core life with a stuck control rod assembly and after xenon decay.

Minimum volumes (including a 10% safety factor) as specified by Figure 3.2-1 for the boric acid addition tank or an operable borated water storage tank (Ref. 3) will each satisfy this requirement. The specification assures that adequate supplies are available whenever the reactor is heated above 200°F so that a single failure will not prevent boration to a cold condition. The minimum volumes of boric acid solution given include the boron necessary to account for xenon decay.

The principal method of adding boron to the primary system is to pump the concentrated boric acid solution (8700 ppm boron, minimum) into the makeup tank using the 25 gpm boric acid pumps.

The alternate method of addition is to inject boric acid from the borated water storage tank using the makeup pumps.

Concentration of boron in the boric acid addition tank may be higher than the concentration which would crystallize at ambient conditions. For this reason and to assure a flow of boric acid is available when needed this tank and its associated piping will be kept 10°F above the crystallization temperature for the concentration present. Once in the makeup system, the concentrate is sufficiently well mixed and diluted so that normal system temperatures assure boric acid solubility.

REFERENCES

1. SAR, Section 9.1; 9.2
2. SAR, Figure 6-2
3. SAR, Section 3

TRM B 3.6 REACTOR BUILDING SYSTEMS

TRM B 3.6.1 Reactor Building Purge Filtration System

BASES

BACKGROUND

The reactor building purge filtration system is designed to filter the reactor building atmosphere during normal operations for ease of personnel entry into the reactor building. This specification is intended to require the system operable during fuel handling operations, if the system is to be used, to limit the release of activity should a fuel handling accident occur. The system consists of one circuit containing a supply and an exhaust fan and a filter train. The filter train consists of a pre-filter, a HEPA filter and a charcoal adsorber in series.

High efficiency particulate air (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential release of radioiodine to the environment.

TEST REQUIREMENTS

TR 3.6.1.1

Pressure drop across the combined HEPA filters and charcoal adsorbers of less than 6 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Pressure drop should be determined at least once per refueling period to show system performance capability.

The in-place test results should indicate a system leak tightness of less than 1 percent bypass leakage for the charcoal adsorbers and a HEPA efficiency of at least 99 percent removal of DOP particulates. The laboratory carbon sample test results should indicate a radioactive methyl iodide removal efficiency of at least 90 percent for expected accident conditions. If the efficiencies of the HEPA filters and charcoal adsorbers are as specified, the resulting doses will be less than the 10 CFR 100 guidelines for the accidents analyzed. Operation of the fans significantly different from the design flow will change the removal efficiency of the HEPA filters and charcoal adsorbers.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. The charcoal adsorber efficiency test procedures should allow for obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. Tests of the charcoal adsorbers with halogenated hydrocarbon refrigerant and of the HEPA filter bank with DOP aerosol shall be performed in accordance with ANSI N510 (1975) "Standard for Testing of Nuclear Air Cleaning Systems."

BASES

TEST REQUIREMENTS (continued)

Any HEPA filters found defective shall be replaced with filters qualified according to Regulatory Position C.3.d. of Regulatory Guide 1.52. Radioactive methyl iodide removal efficiency tests shall be performed in accordance with RDT Standard M16-IT. If laboratory test results are unacceptable, all charcoal adsorbents in the system shall be replaced with charcoal adsorbents qualified according to Regulatory Guide 1.52.

TRM B 3.6 REACTOR BUILDING SYSTEMS

TRM B 3.6.3 Hydrogen Recombiners

BASES

BACKGROUND

The OPERABILITY of the recombiners for the control of hydrogen gas ensures that this equipment will be available to maintain the hydrogen concentration within containment below its flammable limit during post-LOCA conditions.

TEST REQUIREMENTS

TR 3.6.3.1

Calibration shall be performed to assure the presentation and acquisition of accurate information.

TRM B 3.7 PLANT SYSTEMS

TRM B 3.7.2 Spent Fuel Pool

BASES

BACKGROUND

Compliance with this requirement provides assurance that damage to fuel in the spent fuel pool will not be caused by dropping heavy objects onto the fuel. Administrative controls will prohibit the storage of fuel in locations adjoining the walls at the north and south ends of the pool, in the vicinity of cask storage area and fuel tilt pool access gates.

TRM B 3.7 PLANT SYSTEMS

TRM B 3.7.3 Spent Fuel Pool (SFP) - MODE 6

BASES

BACKGROUND

Compliance with this requirement provides assurance that the maximum design temperature of the spent fuel pool cooling system will not be exceeded during a full core offload.

TRM B 3.7 PLANT SYSTEMS

TRM B 3.7.5 Shock Suppressors (Snubbers)

BASES

BACKGROUND

Shock suppressors are designed to prevent unrestrained pipe 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 an inoperable shock suppressor is an increase in the probability of structural damage to piping as a result of a seismic or other event initiating dynamic loads. It is therefore required that all shock suppressors required to protect the primary coolant system or any other safety system or component be operable during reactor operation.

All safety related snubbers are required to be operable to ensure that the structural integrity of the reactor coolant system and all other safety related systems is maintained during and following a seismic or other event initiating dynamic loads. Snubbers excluded from this inspection program are those installed on nonsafety related systems and then only if their failure, or failure of the system on which they are installed, would have no adverse effect on any safety related system.

ACTIONS

A.1, A.2.1, A.2.2, and A.3

Because the shock suppressor protection is required only during low probability events, a period of 72 hours is allowed for repairs, replacements or evaluations. If a review and evaluation of an inoperable snubber is preformed and documented to justify continued operation, and provided all design criteria are met with the inoperable snubber, then the inoperable snubber would not need to be restored or replaced. In case a shutdown is required, the allowance of 36 hours to reach a cold shutdown condition will permit an orderly shutdown consistent with standard operating procedures.

When a snubber is found inoperable, an engineering evaluation is performed, in addition to the determination of the snubber mode of failure, in order to determine if any safety related component or system has been adversely affected by inoperability of the snubber. The engineering evaluation is performed to determine whether or not the snubber mode of failure has imparted a significant effect or degradation on the supported component or system.

If a review and evaluation of an inoperable snubber is performed and documented to justify continued operation, and provided that all design criteria are met with the inoperable snubber, then the inoperable snubber would not need to be restored or replaced.

BASES

TEST REQUIREMENTS

TR 3.7.5.1 and TR 3.7.5.2

The visual inspection frequency is based upon maintaining a constant level of snubber protection to plant systems. Therefore, the required inspection interval varies based upon the number of INOPERABLE snubbers found during the previous inspection in proportion to the sizes of the various snubber populations or categories and the previous inspection interval as specified in NRC Generic Letter 90-09, "Alternative Requirements For Snubber Visual Inspection Intervals and Corrective Actions". Inspections performed before that interval has elapsed may be used as a new reference point to determine the next inspection. However, the result of such early inspections performed before the original required time interval has elapsed (nominal time less 25%) may not be used to lengthen the required inspection interval. Any inspection whose results require a shorter inspection interval will override the previous schedule.

When the cause of the rejection of a snubber is clearly established and remedied for that snubber and for any other snubbers that may be generically susceptible, and verified by inservice functional testing, that snubber may be exempted from being counted as inoperable. 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 by visual inspection, or are similarly located or exposed to the same environmental conditions such as temperature, radiation and vibration.

TRM B 3.7 PLANT SYSTEMS

TRM B 3.7.6 Spent Fuel Cooling System

BASES

BACKGROUND

The primary function of the Spent Fuel Cooling System is to remove the decay heat from the irradiated fuel that is stored in the Spent Fuel Pool (SFP). Due to this decay heat load, the irradiated fuel assemblies must be cooled continuously from the time they are removed from the core to the time they are removed from the site. The Spent Fuel Cooling System is designed to maintain SFP water at approximately 120°F with a heat load based on removing the decay heat generated from one-third of the core fuel assemblies that have been irradiated for 930 days and cooled for 150 hours. In meeting this design bases, the system has the capability of maintaining the SFP at or below 150°F while removing the total decay heat load from the combination of all stored fuel assemblies.

Cooling and purification of the pool water is accomplished by SFP cooling pumps that recirculated the water through heat exchanger(s), with a bypass flow through a lead filter, demineralizer, and a lag filter. The pumps are horizontal, centrifugal units of stainless steel, rated at 1000 gpm with a total dynamic head of 100 feet. The heat exchangers are a two-pass straight tube design with Intermediate Cooling Water (ICW) supplied to the shell side of the heat exchanger.

TRO

One Spent Fuel Cooling heat exchanger with ICW aligned and in service and one SFP cooling pump with a flow rate of ≥ 1000 gpm are required to meet the operability requirements of this system.

TEST REQUIREMENTS

<u>TR 3.7.6.1</u>

The functional test provides flow verification of the Spent Fuel Cooling System. The cooling loop is aligned for recirculation of the pool to provide the normal cooling flow. The purification portion of the system (filter(s) and demineralizer) may be aligned and in service during the functional test. However, the flow rate through the purification piping is not credited in meeting the ≥ 1000 gpm requirement for Spent Fuel Cooling System operability.

TRM B 3.8 ELECTRICAL POWER SYSTEMS

TRM B 3.8.1 Switchyard DC Sources

BASES

BACKGROUND

The ANO switchyard consists of a 500 kV yard and a 161 kV yard connected by a 600 MVA autotransformer bank with a 22 kV tertiary winding. The control power for the 500 kV and 161 kV switchyard breakers can be supplied from three sources: 1) the 125 volt DC battery located in the switchyard control building; 2) the battery charger located in the switchyard control building; and 3) the ANO-1 DC bus "D41." The battery and battery charger operate in parallel continuously. The ANO-1 DC bus may be connected to the switchyard DC bus by a manual throwover switch. The switchyard DC bus is a non-1E power supply and is described in the ANO-1 Safety Analysis Report (SAR) Section 8.2.1.3 (Ref. 1).

TEST REQUIREMENTS

<u>TR 3.8.1.1</u>

The TR 3.8.1.1 verification of battery terminal voltage while on float charge helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the battery charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state. The voltage requirements are based on the nominal design voltage of the battery (2.15 V per cell average) and are consistent with the battery vendor allowable minimum volts per cell. The inability to meet this requirement constitutes an inoperable battery.

<u>TR 3.8.1.2</u>

The TR 3.8.1.2 battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements. A modified performance discharge test may be performed in lieu of a service test. The inability to meet this requirement constitutes an inoperable battery.

The modified performance discharge test is a simulated duty cycle consisting of just two rates; the one minute rate published for the battery or the largest current load of the duty cycle, followed by the test rate employed for the performance test, both of which envelope the duty cycle of the battery. Since the ampere-hours removed by a rated one minute discharge represents a very small portion of the battery capacity, the test rate can be changed to that for the performance test without compromising the results of the performance discharge test. The battery terminal voltage for the modified performance discharge test should remain above the minimum battery voltage specified in the battery service test for the duration of time equal to that of the service test.

BASES

TEST REQUIREMENTS (continued)

A modified performance discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle). This will often confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a service test and the test discharge rate must envelope the duty cycle of the service test if the modified performance discharge test is performed in lieu of a service test.

TR 3.8.1.3

The TR 3.8.1.3 battery performance discharge test is a test of constant current capacity of a battery after having been in service, to detect any change in the capacity determined by the acceptance test. The test is intended to determine overall battery degradation due to age and usage. The inability to meet this requirement constitutes an inoperable battery.

Either the battery performance discharge test or the modified performance discharge test, described above, is acceptable for satisfying TR 3.8.1.3; however, only the modified performance discharge test may be used to satisfy TR 3.8.1.3 while satisfying the requirements of TR 3.8.1.2 at the same time.

The acceptance criteria for this surveillance are consistent with IEEE-450. This reference recommends that the battery be replaced if its capacity is below 80% of the manufacturer's rating. A capacity of 80% shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements.

The frequency for this test is normally 60 months. If the battery shows signs off degradation, or if the battery has reached 85% of its service life and capacity is < 100% of the manufacturer's rating, the frequency is reduced to 12 months. However, if the battery shows no degradation but has reached 85% of its service life, the frequency is only reduced to 24 months for batteries that retain ≥ 100% of the manufacturer's ratings. Degradation is indicated, according to IEEE-450, when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is ≥ 10% below the manufacturer's rating.

REFERENCES

1. SAR, Section 8.2.1.3

TRM B 3.8 ELECTRICAL POWER SYSTEMS

TRM B 3.8.2 Switchyard Battery Cell Parameters

BASES

BACKGROUND

Battery cell parameters must remain within acceptable limits to ensure availability of the required DC power. Cell parameter limits are conservatively established, allowing continued DC electrical system function even with TRM Table 3.3.2-1 Category A and B limits not met.

ACTIONS

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

With one or more cells not within limits (i.e., TRM Table 3.8.2-1 Category A limits not met, or Category B limits not met, or Category A and B limits not met) but within the TRM Table 3.8.2-1 Category C limits, the battery is degraded but still has sufficient capacity to perform its intended function. Therefore, the battery is not required to be considered inoperable solely as a result of Category A or B limits not met. The pilot cell electrolyte level and float voltage are required to be verified to meet the TRM Table 3.8.2-1 Category C limits within 1 hour (Required Action A.1). These checks will provide a quick representative status of the remainder of the battery cells. Verification that the TRM Table 3.8.2-1 Category C limits are met (Required Action A.2) provides assurance that during the time needed to restore the parameters to within the Category A and B limits (Required Action A.3), the battery will still be capable of performing its intended function. This verification is repeated at 7 day intervals until the parameters are restored to within Category A and B limits. This periodic verification is consistent with the increased potential to exceed these battery parameter limits during these conditions.

B.1

With one or more battery cell parameters outside the TRM Table 3.8.2-1 Category C limit for any connected cell, sufficient capacity to supply the maximum expected load requirement is not assured. Therefore, the battery must be immediately declared inoperable and the corresponding DC control power source to the 125VDC switchyard distribution system must be declared inoperable.

Additionally, other potentially extreme conditions, such as average electrolyte temperature of representative cells falling below 60°F or battery terminal voltage below the limit are also cause for immediately declaring the associated DC control power source to the 125 VDC switchyard distribution system inoperable.

BASES

TEST REQUIREMENTS

TR 3.8.2.1

TR 3.8.2.1 verifies that the TRM Table 3.8.2-1 Category A battery cell parameters are consistent with vendor recommendations and IEEE-450, which recommend regular battery inspections (at least once per month) including voltage, specific gravity, and electrolyte level of pilot cells.

TR 3.8.2.2

TR 3.8.2.2 verifies that the TRM Table 3.8.2-1 Category B battery cell parameters are consistent with vendor recommendations and IEEE-450, which recommend regular battery inspections (at least once per quarter) including voltage, specific gravity, and electrolyte level of each connected cell. In addition, within 24 hours after a battery discharge to < 110 V or a battery overcharge to > 150 V, the battery must be demonstrated to meet Category B limits. Transients, such as motor starting transients, which may momentarily cause battery voltage to drop to ≤ 110 V, do not constitute a battery discharge provided battery terminal voltage and float current return to pre-transient values. This inspection is also consistent with IEEE-450, which recommends special inspections following a severe discharge or overcharge, to ensure that no significant degradation of the battery occurs as a consequence of such discharge or overcharge.

TR 3.8.2.3

The TR 3.8.2.3 verification that the average temperature of representative cells is ≥ 60°F is consistent with a recommendation of IEEE-450, which states that the temperature of electrolytes in representative cells (~10% of all connected cells) should be determined on a quarterly basis. Lower than normal temperatures act to inhibit or reduce battery capacity. This surveillance ensures that the operating temperatures remain within an acceptable operating range. This limit is based on manufacturer recommendations.

TRM Table 3.8.2.1

TRM Table 3.8.2-1 delineates the limits on electrolyte level, float voltage, and specific gravity for three different categories. The meaning of each category is discussed below.

Category A defines the normal parameter limit for each designated pilot cell in each battery. The cells selected as pilot cells are those whose temperature, voltage and electrolyte specific gravity approximate the state of charge of the entire battery.

The Category A limits specified for electrolyte level are based on manufacturer recommendations and are consistent with the guidance in IEEE-450, with the extra 1/4 inch allowance above the high water level indication for operating margin to account for temperatures and charge effects. In addition to this allowance, footnote (a) to TRM Table

BASES

TEST REQUIREMENTS (continued)

3.8.2-1 permits the electrolyte level to be above the specified maximum level during equalizing charge, provided it is not overflowing. These limits ensure that the plates suffer no physical damage and that adequate electron transfer capability is maintained in the event of transient conditions. IEEE-450 recommends that electrolyte level readings should be made only after the battery has been at float charge for at least 72 hours.

The Category A limit specified for float voltage is ≥ 2.13 V per cell. This value is based on the battery vendor allowable minimum cell voltage and on a recommendation of IEEE-450, which states that prolonged operation of cells < 2.13 V can reduce the life expectancy of cells.

The Category A limit specified for specific gravity for each pilot cell is ≥ 1.195. This value is characteristic of a charged cell with adequate capacity. According to IEEE-450, the specific gravity readings are based on a temperature of 77°F (25°C).

The specific gravity readings are corrected for actual electrolyte temperature. For each 3°F (1.67°C) above 77°F (25°C), 1 point (0.001) is added to the reading; 1 point is subtracted for each 3°F below 77°F. The specific gravity of the electrolyte in a cell increases with a loss of water due to electrolysis or evaporation.

Category B defines the normal parameter limits for each connected cell. The term "connected cell" excludes any battery cell that is jumpered out.

The Category B limits specified for electrolyte level and float voltage are the same as those specified for Category A and have been discussed above. The Category B limit specified for specific gravity for each connected cell is ≥ 1.190 with the average of all connected cells > 1.195. These values are based on manufacturer's recommendations. The minimum specific gravity value required for each cell ensures that the effects of a highly charged or newly installed cell will not mask overall degradation of the battery.

Category C defines the limits for each connected cell. These values, although reduced, provide assurance that sufficient capacity exists to perform the intended function and maintain a margin of safety. When any battery parameter is outside the Category C limits, the assurance of sufficient capacity described above no longer exists and the battery must be declared inoperable.

The Category C limits specified for electrolyte level (above the top of the plates and not overflowing) ensure that the plates suffer no physical damage and maintain adequate electron transfer capability. The Category C limits for float voltage is based on IEEE-450, which states that a cell voltage of 2.07 V or below, under float conditions and not caused by elevated temperature of the cell, indicates internal cell problems and may require cell replacement.

The Category C limits of average specific gravity ≥ 1.190 is based on manufacturer recommendations. In addition to that limit, it is required that the specific gravity for each connected cell must be no less than 0.020 below the average of all connected cells. This limit ensures that the effect of a highly charged or new cell does not mask overall degradation of the battery.

BASES

TEST REQUIREMENTS (continued)

Footnotes (b) and (c) to TRM Table 3.8.2-1 are applicable to Category A, B, and C specific gravity. Footnote (b) to TRM Table 3.8.2-1 requires the above mentioned correction for electrolyte temperature. The value of 2 amps used in footnote (c) is the nominal value for float current established by the battery vendor as representing a fully charged battery with an allowance for overall battery condition. This current provides, in general, an indication of overall battery condition.

Because of specific gravity gradients that are produced during the recharging process, delays of several days may occur while waiting for the specific gravity to stabilize. A stabilized charger current is an acceptable alternative to specific gravity measurement for determining the state of charge. This phenomenon is discussed in IEEE-450. Footnote (c) to TRM Table 3.8.2-1 allows the float charge current to be used as an alternate to specific gravity for up to 7 days following a battery recharge. Within 7 days each connected cell's specific gravity must be measured to confirm the state of charge. Following a minor battery recharge (such as equalizing charge that does not follow a deep discharge) specific gravity gradients are not significant, and confirming measurements may be made in less than 7 days.

REFERENCES

1. SAR, Section 8.2.1.3

TRM B 3.8 ELECTRICAL POWER SYSTEMS

TRM B 3.8.4 Battery Chargers

BASES

TEST REQUIREMENTS

TR 3.8.4.1

TR 3.8.4.1 requires that each required battery charger be capable of supplying the connected loads while maintaining the battery fully charged. This is based on the assumption that the batteries are fully charged at the beginning of a design basis accident, and on the battery safety function of providing adequate power for the design basis accident loads.

TRM B 3.8 ELECTRICAL POWER SYSTEMS

TRM B 3.8.5 Emergency Lighting

BASES

TEST REQUIREMENTS

TR 3.8.5.1

The TR 3.8.5.1 testing of the emergency lighting is scheduled every 18 months and is subject to review and modification if experience demonstrates a more effective test schedule.

TRM B 3.9 REFUELING OPERATIONS

TRM B 3.9.3 Irradiated Fuel Handling - Reactor Building

BASES

BACKGROUND

Because of physical dimensions of the fuel bridges, it is physically impossible for fuel assemblies to be within 10 feet of each other while being handled.

APPLICABLE SAFETY ANALYSES

TRM 3.9.3.a is required as the safety analysis for the fuel handling accident was based on the assumption that the reactor had been shutdown for 100 hours (Ref. 1).

REFERENCES

1. SAR, Section 14.2.2.3.3