TECHNICAL REQUIREMENTS MANUAL REVISION **16**

ARKANSAS NUCLEAR ONE, UNIT NO. 2

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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 Operation (TROs) and may be written in the current or standard 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 in the instrumentation section where TRO 3.3.3.3 is found without a preceding TRO 3.3.3.2. The page numbering in the TRM is sequential. 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 TR 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 (continued)

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. The 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.
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 and 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).
STAGGERED TEST BASIS	A test schedule for *n* systems, subsystems, trains, or components obtained by dividing the specified test interval into *n* equal subintervals.

1.0 USE AND APPLICATION (continued)

TRM Table 1.1-1

MODES

MODE	REACTIVITY CONDITION, K_{eff}	%RATED THERMAL POWER*	AVERAGE COOLANT TEMPERATURE
1. POWER OPERATION	≥ 0.99	> 5%	≥ 300°F
2. STARTUP	≥ 0.99	≤ 5%	≥ 300°F
3. HOT STANDBY	< 0.99	0	≥ 300°F
4. HOT SHUTDOWN	< 0.99	0	300°F > T_{avg} > 200°F
5. COLD SHUTDOWN	< 0.99	0	≤ 200°F
6. REFUELING**	≤ 0.95	0	≤ 140°F

* Excluding decay heat.

** Reactor vessel head unbolted or removed and fuel in the vessel.

TRM Table 1.1-2

FREQUENCY NOTATION

NOTATION	FREQUENCY
S	At least once per 12 hours.
D	At least once per 24 hours.
W	At least once per 7 days.
M	At least once per 31 days.
Q	At least once per 92 days.
TA	At least once per 123 days.
SA	At least once per 184 days.
R	At least once per 18 months.
S/U	Prior to each reactor startup.
P	Completed prior to each release.

2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR TRIP SETPOINTS

2.2.1 The reactor protective instrumentation setpoints shall be set consistent with the Trip Setpoint values shown in TRM Table 2.2-1.

APPLICABILITY: As shown for each channel in TRM Table 3.3-1.

ACTION:

With a reactor protective instrumentation setpoint less conservative than the value shown in the Allowable Values column of TRM Table 2.2-1, declare the channel inoperable and apply the applicable ACTION statement requirement of TRO 3.3.1.1 until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

TABLE 2.2-1

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUE
Steam Generator Level – High	≤ 85.8% (1)	≤ 86.5% (1)

TABLE NOTATION

(1) % of the distance between steam generator upper and lower narrow range level instrument nozzles.

2.2.1 Steam Generator Level - High

The Steam Generator Level – High trip is provided to protect the turbine from excessive moisture carry over. Since the turbine is automatically tripped when the reactor is tripped, this trip provides a reliable means for providing protection to the turbine from excessive moisture carry over. This trip's setpoint does not correspond to a Technical Specification Safety Limit and no credit was taken in the accident analyses for operation of the trip.

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 Actions of the associated TRO shall be met, except as provided in TRO 3.0.6.
TRO 3.0.3	When a TRO is not met and the associated Actions are not met, an associated Action is not provided, or if directed by the associated 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 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 in the desired MODE to be entered. Entry into a MODE or other specified condition may be made in accordance with Actions when the Actions or the corrective action process has determined that no limitations should be placed on continued plant operation in the desired MODE to be entered. This provision shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with Actions or that are part of a shutdown of the unit. Exceptions to this TRO are stated in the individual requirements.
TRO 3.0.5	When a system, subsystem, train, component or device is determined to be inoperable solely because its normal or emergency power source is inoperable, it may be considered OPERABLE for the purpose of satisfying the requirements of its applicable TRO provided: (1) its corresponding normal or emergency power source is OPERABLE; and (2) all of its redundant system(s), subsystem(s), train(s), component(s), and device(s) are OPERABLE, or likewise satisfy the requirements of this specification. Unless both conditions (1) and (2) are satisfied, a condition report shall be initiated to document the condition and determine any limitations on continued plant operation. TRO 3.0.5 is only applicable in MODES 1, 2, 3, and 4.
TRO 3.0.6	Equipment removed from service or declared inoperable to comply with 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.

4.0 TECHNICAL REQUIREMENT (TR) APPLICABILITY

TR 4.0.1 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 interval shall be failure to meet the TRO except as provided in TR 4.0.3. TRs do not have to be performed on inoperable equipment or variables.

TR 4.0.2 The specified interval for each TR is met if the TR is performed within 1.25 times the interval specified, as measured from the previous performance or as measured from the time a specified condition of the TR is met. For intervals specified as "once," the above interval extension does not apply. If a TR requires periodic performance on a "once per . . ." basis, the above interval extension applies to each performance after the initial performance. Exceptions to this requirement are stated in the individual TROs or TRs.

TR 4.0.3 If it is discovered that a TR was not performed within its specified interval, 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 interval, whichever is greater. This delay period is permitted to allow performance of the TR. A risk evaluation shall be performed for any TR 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 Action(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 Action(s) must be entered.

TR 4.0.4 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 interval. This provision shall not prevent entry into MODES or other specified conditions as required to comply with Actions or that are part of a shutdown of the unit. TR 4.0.4 is only applicable for entry into a MODE or other specified condition associated with MODES 1, 2, 3, and 4.

REACTIVITY CONTROL SYSTEMS

FLOW PATHS – SHUTDOWN

TECHNICAL REQUIREMENT FOR OPERATION

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

a. A flow path from the boric acid makeup tank via either a boric acid makeup pump or a gravity feed connection and charging pump to the Reactor Coolant System if only the boric acid makeup tank in TRO 3.1.2.7a is OPERABLE, or

b. The flow path from the refueling water tank via either a charging pump or a high pressure safety injection pump to the Reactor Coolant System if only the refueling water tank in TRO 3.1.2.7b is OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

With none of the above flow paths OPERABLE, suspend loading irradiated fuel assemblies in the core or operations that could introduce into the RCS, coolant with boron concentration less than required by Technical Specification 3.1.1.2 or 3.9.1 as applicable until at least one injection path is restored to OPERABLE status.

TECHNICAL REQUIREMENTS

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

a. At least once per 7 days by verifying that the temperature of the flow path from the discharge of the boric acid makeup tank to the suction of the charging pump is above 55°F when a flow path from the boric acid makeup tanks is used.

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

REACTIVITY CONTROL SYSTEMS

FLOW PATHS – OPERATING

TECHNICAL REQUIREMENT FOR OPERATION

3.1.2.2 The following boron injection flow paths shall be OPERABLE, depending on the volume available in the boric acid makeup tanks.

a. If the contents of one boric acid makeup tank meet the volume requirements of TRM Figure 3.1-1, two of the following three flow paths to the Reactor Coolant System shall be OPERABLE:

1. One flow path from the appropriate boric acid makeup tank via a boric acid makeup pump and a charging pump.

2. One flow path from the appropriate boric acid makeup tank via a gravity feed connection and a charging pump.

3. One flow path from the refueling water tank via a charging pump.

OR

b. If the contents of both boric acid tanks are needed to meet the volume requirements of TRM Figure 3.1-1, four of the following five flow paths to the Reactor Coolant System shall be OPERABLE:

1. One flow path from boric acid makeup tank A via a boric acid makeup pump and a charging pump.

2. One flow path from boric acid makeup tank B via a boric acid makeup pump and a charging pump.

3. One flow path from boric acid makeup tank A via a gravity feed connection and a charging pump.

4. One flow path from boric acid makeup tank B via a gravity feed connection and a charging pump.

5. One flow path from the refueling water tank via a charging pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one of the boron injection flow paths to the Reactor Coolant System required in (a) or (b) above inoperable, restore the inoperable flow path to the Reactor Coolant System to OPERABLE status within 72 hours. If not restored within 72 hours or with more than one required flow path inoperable, initiate a condition report to document the condition and determine any limitations for the continued operation of the plant.

TECHNICAL REQUIREMENTS

4.1.2.2 The above required flow paths shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that the temperature of the flow path from the discharge of the boric acid makeup tank(s) to the suction of the charging pumps is above 55°F.

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

c. At least once per 18 months during shutdown by verifying that each actuated valve in the flow path actuates to its correct position on a SIAS test signal.

REACTIVITY CONTROL SYSTEMS

CHARGING PUMPS – SHUTDOWN

TECHNICAL REQUIREMENT FOR OPERATION

3.1.2.3 At least one charging pump in the boron injection flow path required OPERABLE pursuant to TRO 3.1.2.1 shall be OPERABLE and capable of being powered from an OPERABLE emergency bus.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no charging pump OPERABLE, suspend loading irradiated fuel in the core or operations that could introduce into the RCS, coolant with boron concentration less than required by Technical Specification 3.1.1.2 or 3.9.1 as applicable until at least one of the required pumps is restored to OPERABLE status.

TECHNICAL REQUIREMENTS

4.1.2.3 No additional Technical Requirements other than those required by the Inservice Testing Program.

REACTIVITY CONTROL SYSTEMS

CHARGING PUMPS – OPERATING

TECHNICAL REQUIREMENT FOR OPERATION

3.1.2.4 At least two charging pumps shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one charging pump OPERABLE, restore at least two charging pumps to OPERABLE status within 72 hours. If not restored within 72 hours or with more than one of the required charging pumps inoperable, initiate a condition report to document the condition and determine any limitations for the continued operation of the plant.

TECHNICAL REQUIREMENTS

4.1.2.4 No additional Technical Requirements other than those required by the Inservice Testing Program.

REACTIVITY CONTROL SYSTEMS

BORIC ACID MAKEUP PUMPS – SHUTDOWN

TECHNICAL REQUIREMENT FOR OPERATION

3.1.2.5 At least one boric acid makeup pump shall be OPERABLE and capable of being powered from an OPERABLE emergency bus if only the flow path through the boric acid makeup pump in TRO 3.1.2.1a above, is OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no boric acid makeup pump OPERABLE as required to complete the flow path of TRO 3.1.2.1a, suspend loading irradiated fuel in the core or operations that could introduce into the RCS, coolant with boron concentration less than required by Technical Specification 3.1.1.2 or 3.9.1 as applicable until at least one boric acid makeup pump is restored to OPERABLE status.

TECHNICAL REQUIREMENTS

4.1.2.5 No additional Technical Requirements other than those required by the Inservice Testing Program.

REACTIVITY CONTROL SYSTEMS

BORIC ACID MAKEUP PUMPS – OPERATING

TECHNICAL REQUIREMENT FOR OPERATION

3.1.2.6 At least the boric acid makeup pump(s) in the boron injection flow path(s) required OPERABLE pursuant to TRO 3.1.2.2 shall be OPERABLE and capable of being powered from an OPERABLE emergency bus if the flow path through the boric acid makeup pump(s) in TRO 3.1.2.2 is OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one boric acid makeup pump required for the boron injection flow path(s) pursuant to TRO 3.1.2.2 inoperable, restore the boric acid makeup pump to OPERABLE status within 72 hours. If not restored within 72 hours or with more than one boric acid makeup pump required in support of TRO 3.1.2.2 inoperable, initiate a condition report to document the condition and determine any limitations for the continued operation of the plant.

TECHNICAL REQUIREMENTS

4.1.2.6 No additional Technical Requirements other than those required by the Inservice Testing Program.

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES – SHUTDOWN

TECHNICAL REQUIREMENT FOR OPERATION

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

a. One boric acid makeup tank with:

1. A minimum indicated tank level of 36%,

2. A boric acid concentration between 3.0 WT% and 3.5 WT%, and

3. A minimum solution temperature of 55°F.

b. The refueling water tank with:

1. A minimum indicated tank level of 7.5%,

2. A minimum boron concentration of 2500 ppm, and

3. A minimum solution temperature of 40°F.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no borated water sources OPERABLE, suspend loading irradiated fuel in the core or operations that could introduce into the RCS, coolant with boron concentration less than required by Technical Specification 3.1.1.2 or 3.9.1 as applicable until at least one borated water source is restored to OPERABLE status.

TECHNICAL REQUIREMENTS

4.1.2.7 The above required borated water source shall be demonstrated OPERABLE:

a. At least once per 7 days by:

1. Verifying the boron concentration of the water,

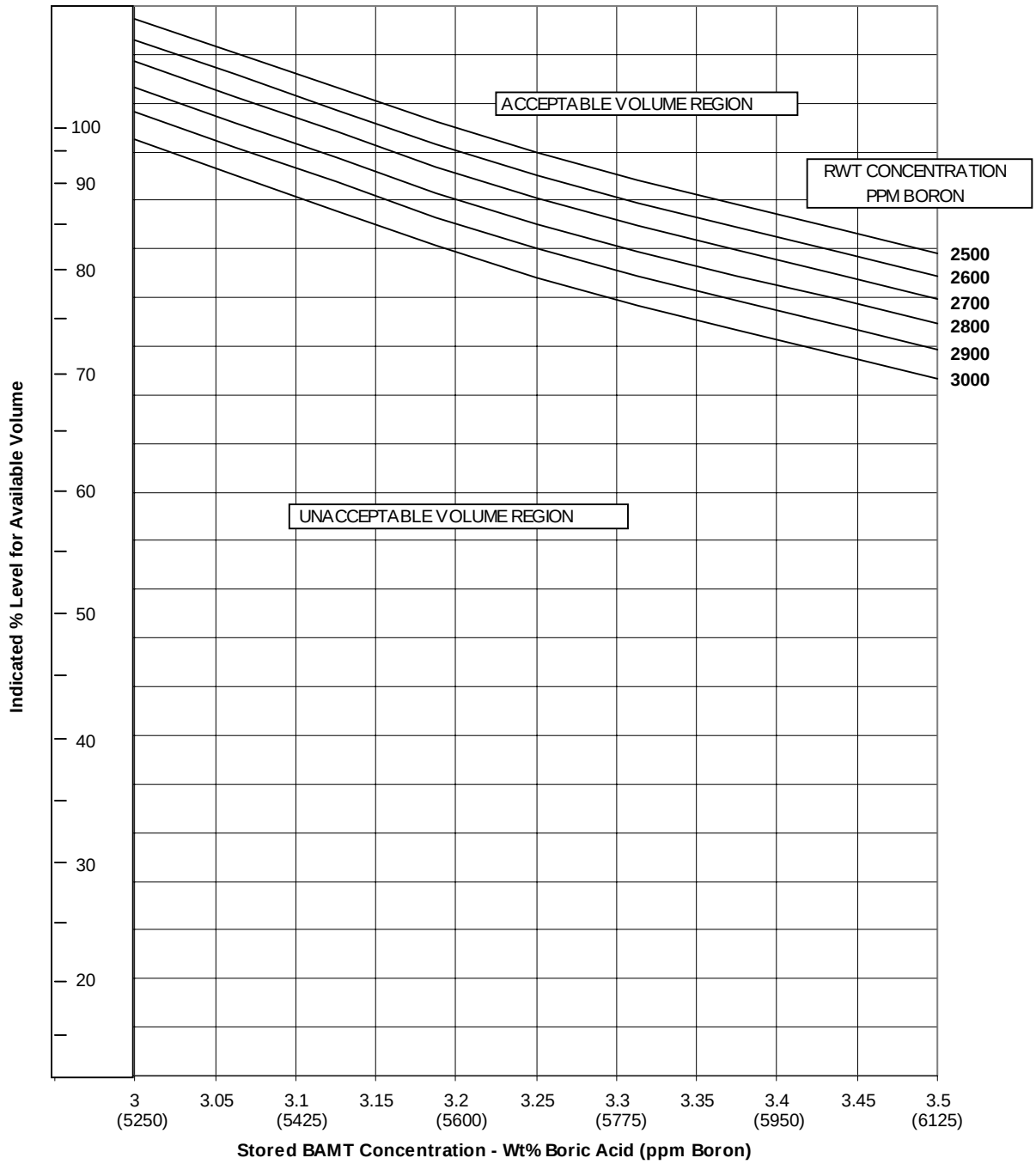
2. Verifying the contained borated water volume of the tank, and

3. Verifying the boric acid makeup tank solution temperature is greater than 55°F.

b. At least once per 24 hours by verifying the RWT temperature when it is the source of borated water and the outside air temperature is < 40°F.

TRM Figure 3.1-1

Minimum Boric Acid Makeup Tank Volume as a Function of Stored BAMT Concentration and Refueling Water Storage Tank Concentration



REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES – OPERATING

TECHNICAL REQUIREMENT FOR OPERATION

3.1.2.8 Each of the following borated water sources shall be OPERABLE:

a. At least one of the following sources with a minimum solution temperature of 55°F.

1. One boric acid makeup tank, with the tank contents in accordance with TRM Figure 3.1-1, or

2. Two boric acid makeup tanks, with the combined contents of the tanks in accordance with TRM Figure 3.1-1, and

b. The refueling water tank with:

1. An indicated tank level of between 91.7% and 100%,

2. Between 2500 and 3000 ppm of boron,

3. A minimum solution temperature of 40°F, and

4. A maximum solution temperature of 110°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the above required boric acid makeup tank(s) inoperable, restore the make up tank(s) to OPERABLE status within 72 hours or initiate a condition report to document the condition and determine any limitations for the continued operation of the plant.

b. With the refueling water tank inoperable, enter the action of Technical Specification 3.5.4.

TECHNICAL REQUIREMENTS

4.1.2.8 Each of the above required borated water sources shall be demonstrated OPERABLE:

a. At least once per 7 days by:

1. Verifying the boron concentration in each water source,

2. Verifying the contained borated water volume in each water source, and

3. Verifying the boric acid makeup tank(s) solution temperature is greater than 55°F.

b. At least once per 24 hours by verifying the RWT temperature.

INSTRUMENTATION

REACTOR PROTECTIVE INSTRUMENTATION

TECHNICAL REQUIREMENT FOR OPERATION

3.3.1.1 As a minimum, the reactor protective instrumentation channels and bypasses of TRM Table 3.3-1 shall be OPERABLE.

APPLICABILITY: As shown in TRM Table 3.3-1.

ACTION:

As shown in TRM Table 3.3-1.

TECHNICAL REQUIREMENTS

4.3.1.1.1 Each reactor protective instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL TEST operations for the MODES and at the frequencies shown in TRM Table 4.3-1.

4.3.1.1.2 The logic for the bypasses shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. The total bypass function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

TRM TABLE 3.3-1

REACTOR PROTECTIVE INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
Steam Generator Level – High	4/SG	2/SG	3/SG	1, 2	1, 2

TRM TABLE 3.3-1

ACTION STATEMENTS

ACTION 1 – With the number of channels OPERABLE one less than the Total Number of Channels, operation in the applicable MODES may continue provided the inoperable channel is placed in the bypassed or tripped condition within 1 hour. If the inoperable channel is bypassed for greater than 48 hours, the desirability of maintaining this channel in the bypassed condition shall be reviewed at the next regularly scheduled OSRC meeting in accordance with the QA Program Manual. The channel shall be returned to OPERABLE status prior to startup following the next COLD SHUTDOWN.

With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units.

ACTION 2 – With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement, operation in the applicable MODES may continue provided the following conditions are satisfied:

a. Verify that one of the inoperable channels has been bypassed and place the other inoperable channel in the tripped condition within 1 hour, and

b. All functional units affected by the bypassed/tripped channel shall also be placed in the bypassed/tripped condition.

Operation in the applicable MODES may continue until the performance of the next required CHANNEL TEST. Subsequent operation in the applicable MODES may continue if one channel is restored to OPERABLE status and the provisions of ACTION 1 are satisfied.

TRM TABLE 4.3-1

REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TESTS	MODES IN WHICH SURVEILLANCE REQUIRED
Steam Generator Level – High	S	R	TA (1)	1, 2

(1) On a STAGGERED TEST BASIS.

INSTRUMENTATION

SEISMIC INSTRUMENTATION

TECHNICAL REQUIREMENT FOR OPERATION

3.3.3.3 The seismic monitoring instrumentation shown in TRM Table 3.3-7 shall be OPERABLE.

APPLICABILITY: At all times.

ACTION:

a. With one or more seismic monitoring instruments inoperable for more than 30 days, immediately initiate a condition report to document the condition and determine any limitations for continued operation of the plant.

b. The provisions of TRO 3.0.3 are not applicable.

TECHNICAL REQUIREMENTS

4.3.3.3.1 Each of the above seismic monitoring instruments shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL TEST operations at the frequencies shown in TRM Table 4.3-4.

4.3.3.3.2 Each of the above seismic monitoring instruments actuated during a seismic event shall be restored to OPERABLE status within 24 hours and a CHANNEL CALIBRATION performed within 5 days following the seismic event. Data shall be retrieved from actuated instruments and analyzed to determine the magnitude of the vibratory ground motion.

TRM TABLE 3.3-7

SEISMIC MONITORING INSTRUMENTATION

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

* With Unit 1 control room indication/or alarm

TRM TABLE 4.3-4

SEISMIC MONITORING INSTRUMENTATION TECHNICAL REQUIREMENTS

INSTRUMENT AND SENSOR LOCATIONS	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST
1. Triaxial Time-History Accelerographs			
a. ACS-8001, Unit 1 Containment Base Slab, Elev. 335'**	M*	R	SA
b. ACS-8002, Unit 1 Top of Containment, Elev. 531'6"	M*	R	SA
2. Triaxial Peak Accelerographs			
a. 2XR-8347, Containment Base Slab, Elev. 336'6"	NA	R	NA
b. 2XR-8348, Primary Shield O/S Reactor Cavity, Elev. 366'3"	NA	R	NA
c. 2XR-8349, Top of Containment, Elev. 531'6"	NA	R	NA
3. Triaxial Response-Spectrum Recorder			
a. 2XR-8350, Containment Base Slab, Elev. 335'6" (O/S Containment)	NA	R	R

* Except seismic trigger
** With Unit 1 control room indication

INSTRUMENTATION

CHLORINE DETECTION SYSTEMS

TECHNICAL REQUIREMENT FOR OPERATION

3.3.3.7 Two independent chlorine detection systems, with their alarm/trip setpoints adjusted to actuate at a chlorine concentration of ≤ 5 ppm, shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one chlorine detection system inoperable, restore the inoperable detection system to OPERABLE status within 7 days or within the next 6 hours initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation.

b. With no chlorine detection system OPERABLE, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation.

TECHNICAL REQUIREMENTS

4.3.3.7.1 Each chlorine detection system shall be demonstrated OPERABLE by performance of a CHANNEL CHECK at least once per 12 hours, a CHANNEL TEST at least once per 31 days and a CHANNEL CALIBRATION at least once per 18 months.

4.3.3.7.2 Each detection system shall be demonstrated OPERABLE at least once per 18 months by verifying that on a control room high chlorine test signal, the system automatically isolates the control room within 10 seconds.

INSTRUMENTATION

3/4.3.4 TURBINE OVERSPEED PROTECTION

TECHNICAL REQUIREMENT FOR OPERATION

3.3.4.1 At least one turbine overspeed protection system shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

With one or more turbine stop, control, reheat stop, or reheat intercept valve inoperable, or with the turbine overspeed protection system otherwise inoperable, immediately initiate a condition report to document the condition and determine any limitations on continued operation of the plant.

TECHNICAL REQUIREMENTS

4.3.4.1.1 The provisions of TRO 4.0.4 are not applicable.

4.3.4.1.2 The above required turbine overspeed protection system shall be demonstrated OPERABLE:

a. At least once per 92 days[(1)] by direct observation of the movement of each of the following valves through at least one complete cycle from the running position:

   1. Four high pressure turbine stop valves.

   2. Four high pressure turbine control valves.

   3. Four low pressure turbine reheat stop and intercept valves.

b. At least once per 18 months by performance of a CHANNEL CALIBRATION on the turbine overspeed protection systems.

c. At least once per 40 months by disassembling at least one of each of the above valves and performing a visual and surface inspection of valve seats, disks and stems and verifying no unacceptable flaws or corrosion.

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(1) The 92 day frequency may be extended on a case by case basis for the main turbine control valves, stop valves, and reheat stop/intercept valves with an approved engineering evaluation that has been evaluated under 10 CFR 50.59.

CONTAINMENT SYSTEMS

CONTAINMENT RECIRCULATION SYSTEM

TECHNICAL REQUIREMENT FOR OPERATION

3.6.4.3 At least two independent containment recirculation fans shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTION:

With one of the above required containment recirculation fans inoperable, restore the inoperable fan to OPERABLE status within 30 days. If not restored within 30 days or with no containment recirculation fan OPERABLE, initiate a condition report to document the condition and determine any limitations for continued operation of the plant.

TECHNICAL REQUIREMENTS

4.6.4.3 Each of the above containment recirculation fans shall be demonstrated OPERABLE:

a. At least once per 92 days on a STAGGERED TEST BASIS by:

1. Verifying that the fan can be started on operator action in the control room, and

2. Verifying that the fan operates for at least 15 minutes.

b. At least once per 18 months by verifying a flow rate of at least 4500 cfm per fan.

REFUELING OPERATIONS

DECAY TIME AND SPENT FUEL STORAGE

TECHNICAL REQUIREMENT FOR OPERATION

3.9.3 The total heat load in the SFP shall remain within the limits specified in TRM Figure 3.9.3-1 or Figure 3.9.3-2, as appropriate.

APPLICABILITY: During movement of irradiated fuel from the reactor pressure vessel to the spent fuel pool.

ACTION:

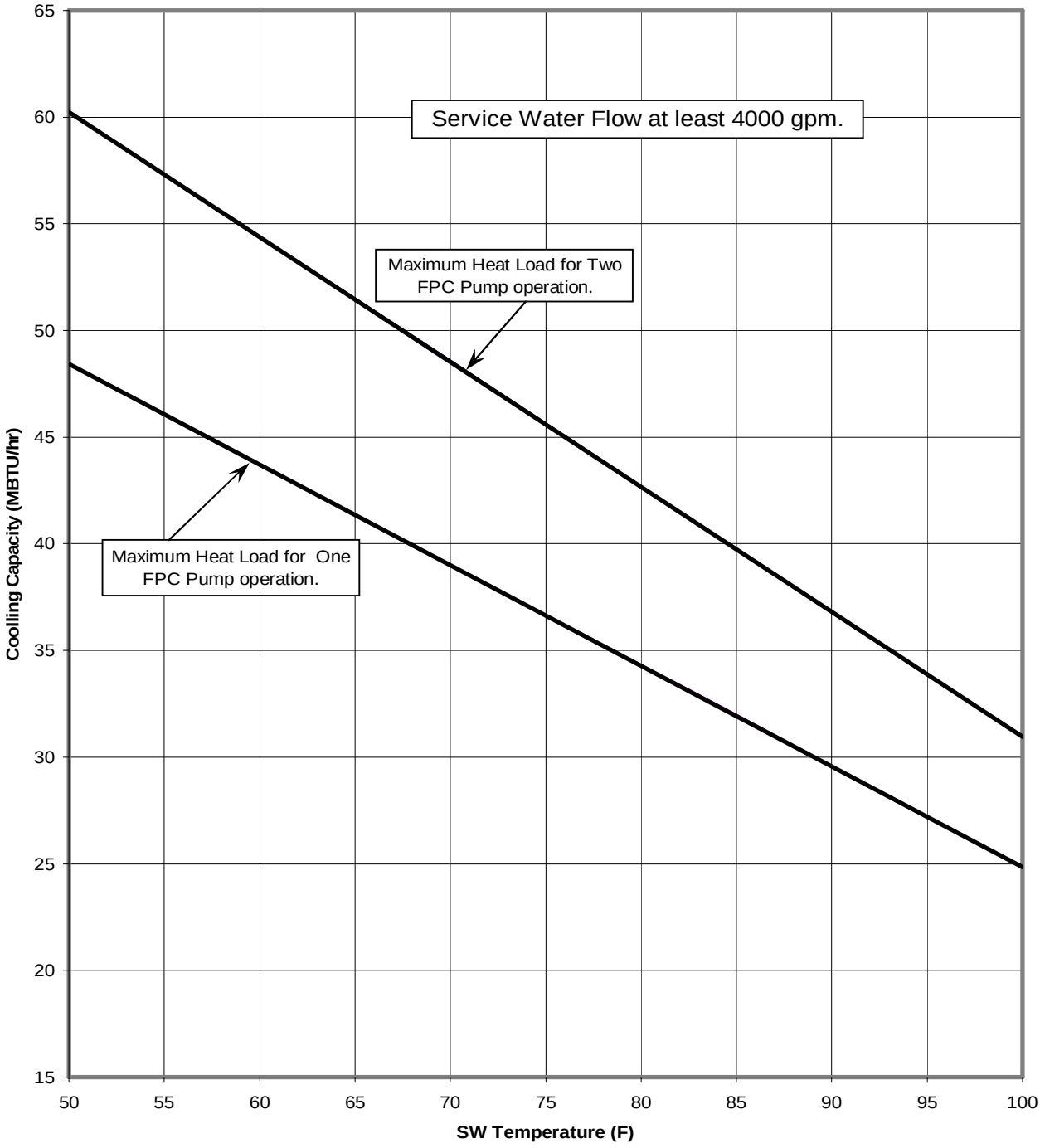
With the total heat load exceeding the requirements in TRM Figure 3.9.3-1 or Figure 3.9.3-2, as appropriate, or with no SFP cooling pump in operation, suspend all transfer of irradiated fuel to the SFP until the limits are restored.

TECHNICAL REQUIREMENTS

4.9.3 The total heat load in the pool shall be determined to be less than the limits specified in TRM Figure 3.9.3-1 or Figure 3.9.3-2, as appropriate, when transferring irradiated fuel from the reactor pressure vessel to the SFP.

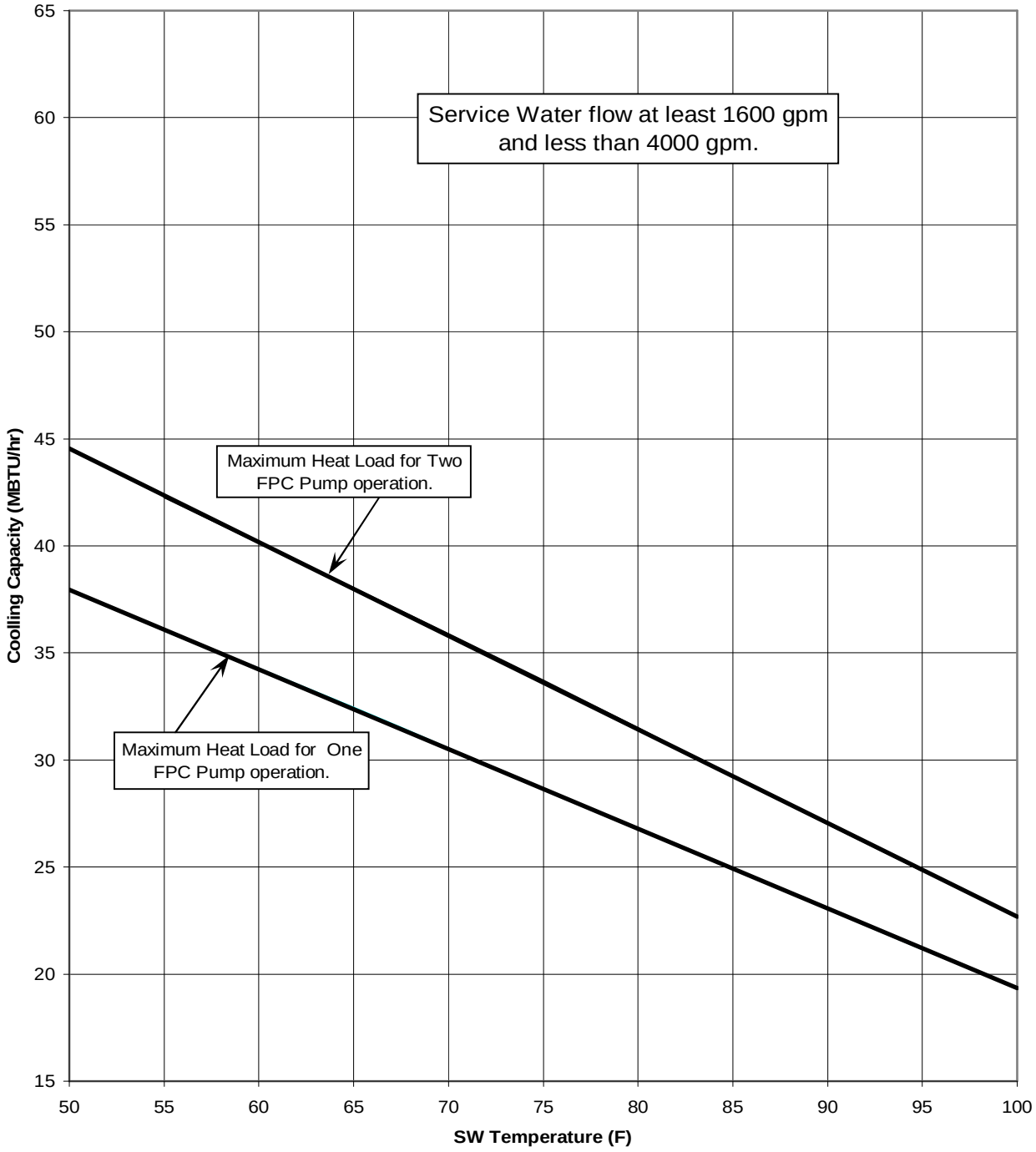
TRM Figure 3.9.3-1

Spent Fuel Pool Cooling Capacity



TRM Figure 3.9.3-2

Spent Fuel Pool Cooling Capacity



6.9 None.

3/4.1.2 BORATION SYSTEMS

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

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The boration capability of either system is sufficient to provide a Shutdown Margin from expected operating conditions of that specified in the Core Operating Limits Report after xenon decay and cooldown to 200°F. The maximum expected boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires boric acid solution from the boric acid makeup tanks in the allowable concentrations and volumes of TRM Specification 3.1.2.8 and a small fraction of the borated water from the refueling water tank required in TRM Specification 3.1.2.8.

The requirement in TRM Specification 3.1.2.8 for a minimum available volume of borated water in the refueling water tank ensures the capability for borating the RCS to the desired concentration. The value listed is consistent with the plant ECCS requirements.

With the RCS temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting loading irradiated fuel in the core and other positive reactivity changes in the event the single injection system becomes inoperable.

The boron capability required below 200°F is based upon providing a sufficient Shutdown Margin after xenon decay and cooldown from 200°F to 140°F. This condition requires either borated water from the refueling water tank or boric acid solution from the boric acid makeup tank(s) in accordance with the requirements of TRM Specification 3.1.2.7. The contained water volume limits includes allowance for water not available because of discharge line location and other physical characteristics.

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

The limits on water volume and boron concentration of the boric acid sources, when mixed with the TSP, ensures a long term pH value of ≥ 7.0 for the solution recirculated within containment after a LOCA. This pH limit minimizes the evolution of iodine and helps to inhibit stress corrosion cracking of austenitic stainless steel components in containment during the recirculation phase following an accident.

3/4.1.2 BORATION SYSTEMS (continued)

Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Coolant added must be from sources that have a boron concentration greater than that required for minimum SDM or boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

3/4.3.1.1 REACTOR PROTECTIVE INSTRUMENTATION

The OPERABILITY of the protective instrumentation systems and bypasses ensure that 1) the associated reactor trip will be initiated when the parameter monitored by each channel or combination thereof reaches its setpoint, 2) the specified coincidence logic is maintained, 3) sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance, and 4) sufficient system functional capability is available for protective purposes from diverse parameters.

The OPERABILITY of these systems is required to provide the overall reliability, redundancy and diversity assumed available in the facility design for the protection of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the accident analyses.

The surveillance requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability. The triannual channel functional testing frequency is to be performed on a STAGGERED TEST BASIS.

The measurement of response time at the specified frequencies provides assurance that the protective function associated with each channel is completed within the time limit assumed in the accident analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable.

Plant Protective System (PPS) logic is designed for operation as a 2-out-of-3 logic, although normally it is operated in a 2-out-of-4 mode.

The bypass term in the RPS LCOs applies to the automatic operating bypass removal feature and not the PPS trip channel bypass feature. If the bypass enable function is failed so as to prevent entering a bypass condition, operation may continue.

3/4.3.3.3 SEISMIC INSTRUMENTATION

The OPERABILITY of the seismic 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 Earthquakes," March, 1971.

3/4.3.3.7 CHLORINE DETECTION SYSTEMS

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.

3/4.3.4.1 TURBINE OVERSPEED PROTECTION

This requirement is provided to ensure that the turbine overspeed protection instrumentation and the turbine speed control valves are OPERABLE and will protect the turbine from excessive overspeed. Protection from turbine excessive overspeed is required since excessive overspeed of the turbine could generate potentially damaging missiles which could impact and damage safety related components, equipment or structures.

3/4.9.3 DECAY TIME

The total anticipated heat load in the SFP comes from the spent fuel currently stored in the pool and from that to be transferred to the pool. The decay time for movement of irradiated fuel assemblies to the SFP is controlled by the maximum cooling capacity of the SFP in order to maintain temperature within design limits. The parameters impacting the cooling capacity of the SFP are the number of Fuel Pool Cooling pumps in operation, the service water flowrate to the SFP heat exchanger, and the service water temperature.

TRM Figures 3.9.3-1 and 3.9.3-2 depict the cooling capacity limits for the spent fuel pool based upon these parameters. The curves on Figure 3.9.3-1 are based on a total service water flowrate through the SFP heat exchanger of at least 4000 gpm. The curves on Figure 3.9.3-2 are based on a total service water flowrate through the SFP heat exchanger of at least 1600 gpm. Each figure has two curves based on the operation of either one or two Fuel Pool Cooling pumps. The curves are based on not exceeding a Spent Fuel Pool temperature of 150°F during core offload.