

MONTICELLO NUCLEAR  
GENERATING PLANT  
TECHNICAL REQUIREMENTS  
MANUAL

**TABLE 1 (Page 1 of 1)**  
**MONTICELLO NUCLEAR GENERATING PLANT**  
**TRM LIST OF EFFECTIVE SECTIONS/SPECIFICATIONS**

<u>Section/Specification</u>	<u>Revision</u> <u>No.</u>
1.1	0
1.2	0
1.3	0
1.4	0
3.0	0
3.3.1.1	0
3.3.2.1	0
3.3.3.1	0
3.3.4.1	0
3.3.5.1	0
3.3.7.1	1
3.4.1	0
3.4.2	0
3.4.3	0
3.5.1	0
3.5.2	0
3.6.1.3	0
3.6.1.7	2
3.8.1	0
3.8.2	0
3.9.1	0
5.2	0
Appendix A	2
Appendix B	0
Appendix C	0

**TABLE 2 (Page 1 of 1)  
TRM RECORD OF REVISIONS**

<b>Revision Number</b>	<b>Affected Section/ Specification</b>	<b>Description of Revision</b>
0	All	Original TRM Issuance
1	3.3.7.1	License Amendment 148 removed the Control Room Air Intake Radiation Monitors from Technical Specification 3.3.7.1. The monitors were added to the TRM as new Specification 3.3.7.1 as required by NRC Commitment M06030A.
2	Appendix A	Revised control rod scram time limits at 0 psig reactor pressure to reflect Calculation CA-01-231, Revision 1.
	3.6.1.7	Corrected typo. Changed Required Action B.1 to A.1 in Specification 3.6.1.7.

TRM TABLE OF CONTENTS

Page Number

1.0	USE AND APPLICATION	
1.1	Definitions.....	1.1-1
1.2	Logical Connectors.....	1.2-1
1.3	Completion Times .....	1.3-1
1.4	Frequency .....	1.4-1
2.0	Not Used	
3.0	TECHNICAL LIMITING CONDITION FOR OPERATION (TLCO) APPLICABILITY ...	3.0-1
3.0	TECHNICAL SURVEILLANCE REQUIREMENT (TSR) APPLICABILITY .....	3.0-3
3.1	Not Used	
3.2	Not Used	
3.3	INSTRUMENTATION	
3.3.1.1	Turbine Condenser Vacuum - Low Instrumentation .....	3.3.1.1-1
3.3.2.1	Control Rod Block Instrumentation.....	3.3.2.1-1
3.3.3.1	Post Accident Monitoring (PAM) Instrumentation.....	3.3.3.1-1
3.3.4.1	Anticipated Transient Without Scram (ATWS) Alternate Rod Injection Instrumentation.....	3.3.4.1-1
3.3.5.1	Loss of Auxiliary Power Instrumentation .....	3.3.5.1-1
3.3.7.1	Control Room Air Intake Radiation – High Instrumentation.....	3.3.7.1-1
3.4	REACTOR COOLANT SYSTEM (RCS)	
3.4.1	RCS Chemistry.....	3.4.1-1
3.4.2	Safety/Relief Valve (S/RV) Bellows and Bellows Monitoring System.....	3.4.2-1
3.4.3	Snubbers .....	3.4.3-1
3.5	EMERGENCY CORE COOLING SYSTEM (ECCS)	
3.5.1	Automatic Depressurization System (ADS) Inhibit Switch.....	3.5.1-1
3.5.2	Core Spray (CS) System Nozzle Differential Pressure Instrumentation.....	3.5.2-1
3.6	CONTAINMENT SYSTEMS	
3.6.1.3	Primary Containment Isolation Valves (PCIVs).....	3.6.1.3-1
3.6.1.7	Suppression Chamber-to-Drywell Vacuum Breakers.....	3.6.1.7-1
3.7	Not Used	
3.8	ELECTRICAL POWER SYSTEMS	
3.8.1	Northern States Power (NSP) Transmission Lines .....	3.8.1-1
3.8.2	24 VDC Battery Systems.....	3.8.2-1
3.9	REFUELING OPERATIONS	
3.9.1	Decay Time .....	3.9.1-1
4.0	Not Used	

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5.0	ADMINISTRATIVE CONTROLS	
5.1	Not Used	
5.2	Organization .....	5.2-1
APPENDICES		
APPENDIX A	Control Rod Scram Time Limits For Reactor Pressures < 800 psig.....	A-1
APPENDIX B	Secondary Containment Isolation Valves.....	B-1
APPENDIX C	Setpoint Methodology and Nominal Trip Setpoints for Selected ITS Functions.....	C-1

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1.0 USE AND APPLICATION

1.1 Definitions

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-----NOTES-----

- 1. Definitions are defined in Section 1.1 of the Technical Specifications (TS) and are applicable throughout the Technical Requirements Manual (TRM) and Bases. Only definitions specific to the TRM will be defined in this section.
- 2. The defined terms of this section and the Technical Specifications (TS) appear in capitalized type and are applicable throughout the TRM and the TRM Bases.
- 3. When a term is defined in both the TS and the TRM, the TRM definition takes precedence within the TRM and the TRM Bases.

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<u>Term</u>	<u>Definition</u>
ACTIONS	ACTIONS shall be that part of a Requirement that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
OPERABLE - OPERABILITY	A system, subsystem, division, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, division, component, or device to perform its specified function(s) are also capable of performing their related support function(s).

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## 1.0 USE AND APPLICATION

### 1.2 Logical Connectors

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Logical Connectors are discussed in Section 1.2 of the Technical Specifications and are applicable throughout the Technical Requirements Manual and Bases.

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## 1.0 USE AND APPLICATION

### 1.3 Completion Times

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Completion Times are discussed in Section 1.3 of the Technical Specifications and are applicable throughout the Technical Requirements Manual and Bases.

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## 1.0 USE AND APPLICATION

### 1.4 Frequency

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Frequency is discussed in Section 1.4 of the Technical Specifications and is applicable throughout the Technical Requirements Manual and Bases.

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3.0 TECHNICAL LIMITING CONDITION FOR OPERATION (TLCO) APPLICABILITY

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TLCO 3.0.1	TLCOs shall be met during the MODES or other specified conditions in the Applicability, except as provided in TLCO 3.0.2.
TLCO 3.0.2	<p>Upon discovery of a failure to meet a TLCO, the Required Actions of the associated Conditions shall be met, except as provided in TLCO 3.0.5.</p> <p>If the TLCO is met or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated.</p>
TLCO 3.0.3	<p>When a TLCO is not met and the associated ACTIONS are not met, an associated ACTION is not provided, or if directed by the associated ACTIONS, action shall be initiated within 1 hour to:</p> <ol style="list-style-type: none"> <li>a. Implement appropriate compensatory actions as needed;</li> <li>b. Verify that the plant is not in an unanalyzed condition; and</li> <li>c. Verify that a required safety function is not compromised by the inoperabilities.</li> </ol> <p>In addition, within 12 hours, obtain the Operation Manager's approval of the compensatory actions and plan for exiting TLCO 3.0.3.</p> <p>Exceptions to this TLCO are stated in the individual TLCOs.</p> <p>Where corrective measures are completed that permit operation in accordance with the TLCO or ACTIONS, completion of the actions required by TLCO 3.0.3 is not required.</p> <p>Actions a, b, and c shall be performed consistent with the Requirements of Generic Letter 91-18.</p>
TLCO 3.0.4	<p>When a TLCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made:</p> <ol style="list-style-type: none"> <li>a. When the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time;</li> <li>b. After performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate; exceptions to this TLCO are stated in the individual TLCOs; or</li> </ol>

TLCO Applicability

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TLCO 3.0.4 (continued)

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

This TLCO shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with TS or TRM ACTIONS or that are part of a shutdown of the unit.

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TLCO 3.0.5

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 its OPERABILITY or the OPERABILITY of other equipment. This is an exception to TLCO 3.0.2 for the system returned to service under administrative control to perform the testing required to demonstrate OPERABILITY.

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TECHNICAL SURVEILLANCE REQUIREMENT (TSR) APPLICABILITY

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TSR 3.0.1           TSRs shall be met during the MODES or other specified conditions in the Applicability for individual TLCOs, unless otherwise stated in the TSR. Failure to meet a TSR, whether such failure is experienced during the performance of the TSR or between performances of the TSR, shall be failure to meet the TLCO. Failure to perform a TSR within the specified Frequency shall be failure to meet the TLCO except as provided in TSR 3.0.3. TSRs do not have to be performed on inoperable equipment or variables outside specified limits.

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TSR 3.0.2           The specified Frequency for each TSR is met if the TSR 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 TSR are stated in the individual TSRs.

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TSR 3.0.3           If it is discovered that a TSR was not performed within its specified Frequency, then compliance with the requirement to declare the TLCO 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 TSR. A risk evaluation shall be performed for any TSR delayed greater than 24 hours and the risk impact shall be managed.

If the TSR is not performed within the delay period, the TLCO must immediately be declared not met, and the applicable Condition(s) must be entered.

When the TSR is performed within the delay period and the TSR is not met, the TLCO must immediately be declared not met, and the applicable Condition(s) must be entered.

TSR Applicability (continued)

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TSR 3.0.4            Entry into a MODE or other specified condition in the Applicability of a TLCO shall only be made when the TLCO's TSRs have been met within their specified Frequency, except as provided by TSR 3.0.3. When a TLCO is not met due to TSRs not having been met, entry into a MODE or other specified condition in the Applicability shall only be made in accordance with TLCO 3.0.4.

This provision shall not prevent entry into MODES or other specified conditions in the Applicability that are required to comply with TS or TRM ACTIONS or that are part of a shutdown of the unit.

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3.3 INSTRUMENTATION

3.3.1.1 Turbine Condenser Vacuum - Low Instrumentation

TLCO 3.3.1.1 Two Turbine Condenser Vacuum - Low channels in each Reactor Protection System trip system shall be OPERABLE.

APPLICABILITY: MODE 1,  
MODE 2 with reactor steam dome pressure  $\geq$  600 psig.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Place channel in trip.	12 hours
	<u>OR</u>	
	A.2 Place associated trip system in trip.	12 hours
B. One or more channels inoperable in both trip systems.	B.1 Place channel in one trip system in trip.	6 hours
	<u>OR</u>	
	B.2 Place one trip system in trip.	6 hours
C. Turbine Condenser Vacuum - Low trip capability not maintained.	C.1 Restore Turbine Condenser Vacuum - Low trip capability.	1 hour
D. Required Action and associated Completion Time not met.	D.1 Enter TLCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

-----NOTE-----

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided Turbine Condenser Vacuum - Low trip capability is maintained.

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SURVEILLANCE		FREQUENCY
TSR 3.3.1.1.1	Perform CHANNEL FUNCTIONAL TEST.	31 days
TSR 3.3.1.1.2	Perform CHANNEL CALIBRATION. The Allowable Value is $\geq$ 21.7 inches vacuum Hg.	31 days

3.3 INSTRUMENTATION

3.3.2.1 Control Rod Block Instrumentation

TLCO 3.3.2.1 The control rod block instrumentation for each Function in Table 3.3.2.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2.1-1

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. -----NOTE----- Only applicable to Functions 1, 2, and 3. ----- One or more Functions with one required channel inoperable.</p>	<p>A.1 Restore channel to OPERABLE status.</p>	7 days
<p>B. -----NOTE----- Only applicable to Functions 1, 2, and 3. ----- One or more Functions with two required channels inoperable.</p>	<p>B.1 Place channel in the tripped condition.  <u>OR</u> B.2 Suspend control rod withdrawal.</p>	<p>Immediately  Immediately</p>
<p>C. One or more required Function 4 channels inoperable.</p>	<p>C.1 Place channel in the tripped condition.  <u>OR</u> C.2 Suspend control rod withdrawal.</p>	<p>Immediately  Immediately</p>

SURVEILLANCE REQUIREMENTS

-----NOTE-----

1. Refer to Table 3.3.2.1-1 to determine which TSRs apply for each Control Rod Block Function.
  2. When a channel is placed in an inoperable status solely for performance of required Surveillance, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability.
- 

SURVEILLANCE		FREQUENCY
TSR 3.3.2.1.1	Perform CHANNEL CHECK.	12 hours
TSR 3.3.2.1.2	<p>-----NOTE-----</p> <ol style="list-style-type: none"> <li>1. For Function 1.b, not required to be performed if SRM detectors are secured in the full-in position.</li> <li>2. For Function 2.a and 2.b, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.</li> </ol> <p>-----</p> Perform CHANNEL FUNCTIONAL TEST.	7 days
TSR 3.3.2.1.3	Perform CHANNEL FUNCTIONAL TEST.	92 days
TSR 3.3.2.1.4	Perform CHANNEL CALIBRATION.	92 days
TSR 3.3.2.1.5	<p>-----NOTE-----</p> <ol style="list-style-type: none"> <li>1. Neutron detectors are excluded.</li> <li>2. For Function 2.a and 2.b, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.</li> </ol> <p>-----</p> Perform CHANNEL CALIBRATION.	24 months

Table 3.3.2.1-1 (page 1 of )  
Control Rod Block Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Source Range Monitors				
a. Upscale	2 <sup>(a)</sup> , 5	1	TSR 3.3.2.1.1 TSR 3.3.2.1.2 TSR 3.3.2.1.5	≤ 1.16 x 10 <sup>5</sup> cps
b. Detector Not Fully Inserted	2 <sup>(b)</sup> , 5 <sup>(b)</sup>	1	TSR 3.3.2.1.2 TSR 3.3.2.1.5	NA
2. Intermediate Range Monitors				
a. Downscale	2 <sup>(c)</sup> , 5 <sup>(c)</sup>	2 <sup>(d)</sup>	TSR 3.3.2.1.1 TSR 3.3.2.1.2 TSR 3.3.2.1.5	≥ 3/125 divisions of full scale
b. Upscale	2, 5	2 <sup>(d)</sup>	TSR 3.3.2.1.1 TSR 3.3.2.1.2 TSR 3.3.2.1.5	≤ 109.5/125 divisions of full scale
3. Average Power Range Monitors				
a. Flow Referenced Neutron Flux - Upscale	1	2 <sup>(f)</sup>	TSR 3.3.2.1.3 TSR 3.3.2.1.4	≤ 0.66W + 55.6% RTP and ≤ 110% RTP <sup>(e)</sup>
b. Downscale	1	2 <sup>(f)</sup>	TSR 3.3.2.1.3 TSR 3.3.2.1.4	≥ 2/125 divisions of full scale
4. Scram Discharge Volume				
a. East Water Level High	1, 2	1	TSR 3.3.2.1.3 TSR 3.3.2.1.4	≤ 40 gal
b. West Water Level High	1, 2	1	TSR 3.3.2.1.3 TSR 3.3.2.1.4	≤ 40 gal

(a) With IRMs on Range 6 or below.

(b) With SRM channel count rate < 100 cps and IRMs on Range 2 or below.

(c) With IRMs on Range 2 or above.

(d) There must be at least one OPERABLE IRM channel monitoring each core quadrant.

(e)  $0.66(W-5.4)+55.6\%$  when reset for single loop operation. The setpoints must be reset within 24 hours of entering single loop operation. "W" is the percent of drive flow required to produce a rated core flow of  $57.6 \times 10^6$  lb/hr.

(f) One required channel in a trip system may be inoperable provided 3 channels are OPERABLE in the other trip system.

3.3 INSTRUMENTATION

3.3.3.1 Post Accident Monitoring (PAM) Instrumentation

TLCO 3.3.3.1 The PAM instrumentation for each Function in Table 3.3.3.1-1 shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Prepare an evaluation in accordance with the Corrective Action Program outlining the alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the channel to OPERABLE status.	30 days
C. One or more Functions with two required channels inoperable.	C.1 Enter the Condition referenced in Table 3.3.3.1-1 for the channel.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. As required by Required Action C.1 and referenced in Table 3.3.3.1-1.	D.1 Monitor torus temperature for signs of an open Safety/Relief Valve.	Once per 12 hours
	<u>AND</u> D.2 Restore one required channel to OPERABLE status.	30 days
E. Required Action and associated Completion Time of Condition D not met.  <u>OR</u> As required by Required Action C.1 and referenced in Table 3.3.3.1-1.	E.1 Initiate preplanned alternate method of monitoring appropriate parameters.	Immediately

SURVEILLANCE REQUIREMENTS

-----NOTE-----

When a channel is placed in an inoperable status solely for performance of the required Surveillance, entry into the associated Conditions and Required Actions may be delayed for up to 6 hours provided the other required channel in the associated Function is OPERABLE.

SURVEILLANCE	FREQUENCY
TSR 3.3.3.1.1 Perform CHANNEL CHECK for each required channel.	31 days
TSR 3.3.3.1.2 Perform CHANNEL CALIBRATION for each required channel.	24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
TSR 3.3.3.1.3 For Function 1 channels, verify recorder traces or computer logs indicate sensor responses.	Following each S/RV actuation

Table 3.3.3.1-1 (page 1 of 1)  
Post Accident Monitoring Instrumentation

FUNCTION	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1
1. Safety/Relief Valve (S/RV) Position	2 per S/RV <sup>(a)</sup>	D
2. Offgas Stack Wide Range Radiation	2	E
3. Reactor Building Vent Wide Range Radiation	2	E

(a) One pressure switch channel and one thermocouple position indication channel.

3.3 INSTRUMENTATION

3.3.4.1 Anticipated Transient Without Scram (ATWS) Alternate Rod Injection Instrumentation

TLCO 3.3.4.1 Two channels per trip system for each ATWS Alternate Rod Injection instrumentation Function listed below shall be OPERABLE:

- a. Reactor Vessel Water Level - Low Low; and
- b. Reactor Vessel Steam Dome Pressure - High.

APPLICABILITY: MODE 1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Restore channel to OPERABLE status.	14 days
	<p><u>OR</u></p> <p>A.2 -----NOTE----- Not applicable if inoperable channel is the result of an inoperable solenoid valve. -----</p> <p>Place channel in trip.</p>	14 days
B. One Function with ATWS Alternate Rod Injection trip capability not maintained.	B.1 Restore ATWS Alternate Rod Injection trip capability.	72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Both Functions with ATWS Alternate Rod Injection trip capability not maintained.	C.1 Restore ATWS Alternate Rod Injection trip capability for one Function.	1 hour
D. Required Action and associated Completion Time not met.	D.1 Enter TLCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

-----NOTE-----  
 When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains ATWS Alternate Rod Injection trip capability.  
 -----

SURVEILLANCE	FREQUENCY
TSR 3.3.4.1.1 -----NOTE----- Not required for the time delay portion of the Reactor Vessel Water Level - Low Low Function. ----- Perform CHANNEL CHECK.	12 hours
TSR 3.3.4.1.2 Perform CHANNEL FUNCTIONAL TEST.	92 days
TSR 3.3.4.1.3 Calibrate the trip units.	92 days

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
TSR 3.3.4.1.4	Perform CHANNEL CALIBRATION of Reactor Vessel Water Level - Low Low time delay relays. The Allowable Value shall be $\geq 6$ seconds and $\leq 8.6$ seconds.	184 days
TSR 3.3.4.1.5	Perform CHANNEL CALIBRATION. The Allowable Values shall be: <ul style="list-style-type: none"> <li>a. Reactor Vessel Water Level - Low Low <math>\geq - 48</math> inches; and</li> <li>b. Reactor Vessel Steam Dome Pressure - High <math>\leq 1155</math> psig.</li> </ul>	24 months

3.3 INSTRUMENTATION

3.3.5.1 Loss of Auxiliary Power Instrumentation

TLCO 3.3.5.1 Two channels (one channel is a circuit breaker contact and the other channel is an undervoltage relay) of Loss of Auxiliary Power instrumentation shall be OPERABLE in each of two trip systems.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Loss of Auxiliary Power instrument channel inoperable in one or more trip systems.	A.1 Restore Loss of Auxiliary Power instrument channels to OPERABLE status.	12 hours
B. Required Action and associated Completion Time of Condition A not met.  <u>OR</u>  Two Loss of Auxiliary Power instrument channels inoperable in one or both trip systems.	B.1 Declare associated low pressure ECCS pumps inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

-----NOTE-----

When a channel is placed in an inoperable status solely for performance of the required Surveillance, entry into the associated Conditions and Required Actions may be delayed for up to 6 hours provided that at least one other OPERABLE channel in the same trip system is monitoring that parameter.

SURVEILLANCE	FREQUENCY
TSR 3.3.5.1.1 Perform CHANNEL CALIBRATION.	24 months

3.3 INSTRUMENTATION

3.3.7.1 Control Room Air Intake Radiation - High Instrumentation

TLCO 3.3.7.1 One channel per trip system of the Control Room Air Intake Radiation - High Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,  
During movement of recently irradiated fuel assemblies in the secondary containment,  
During operations with a potential for draining the reactor vessel (OPDRVs).

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Place the associated CREF subsystem in the pressurization mode of operation.	1 hour
	<u>OR</u>	
	A.2 Declare associated CREF subsystem inoperable.	1 hour

SURVEILLANCE REQUIREMENTS

-----NOTE-----

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 8 hours provided the associated Function maintains CREF System initiation capability.

SURVEILLANCE		FREQUENCY
TSR 3.3.7.1.1	Perform CHANNEL CHECK.	12 hours
TSR 3.3.7.1.2	Perform CHANNEL FUNCTIONAL TEST.	31 days
TSR 3.3.7.1.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be $\leq 2$ mR/hour.	24 months

### 3.4 REACTOR COOLANT SYSTEM (RCS)

#### 3.4.1 RCS Chemistry

TLCO 3.4.1        The chemistry of the reactor coolant system shall be maintained within the limits specified in Table 3.4.1-1.

APPLICABILITY:    MODES 1, 2, and 3.

#### ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS chemistry not within required limits.	A.1    Enter TLCO 3.0.3.	Immediately

**SURVEILLANCE REQUIREMENTS**

SURVEILLANCE		FREQUENCY
TSR 3.4.1.1	Analyze sample of reactor coolant for conductivity and chloride ion concentration.	<p>4 hours during startup and at steaming rates &lt; 100,000 lbs/hr</p> <p><u>AND</u></p> <p>96 hours at steaming rates ≥ 100,000 lbs/hr</p> <p><u>AND</u></p> <p>Once when continuous conductivity monitor indicates abnormal conductivity (other than short term spikes) at steaming rates ≥ 100,000 lbs/hr</p>
TSR 3.4.1.2	Analyze sample of reactor coolant for conductivity and chloride ion concentration.	<p>Once within 12 hours if continuous conductivity monitor is inoperable and THERMAL POWER &gt; 1% RTP</p> <p><u>AND</u></p> <p>12 hours thereafter</p>

Table 3.4.1-1 (page 1 of 1)  
Reactor Coolant Chemistry Limits

Parameter	Steaming Rate < 100,000 lbs/hr <sup>(a)</sup>	Steaming Rate ≥ 100,000 lbs/hr <sup>(a)</sup>
Conductivity	≤ 5 μmho/cm	≤ 5 μmho/cm
Chloride ion concentration	≤ 0.1 ppm	≤ 0.5 ppm

- (a) Upon commencing a reactor startup until 24 hours after THERMAL POWER is > 1% RTP, the conductivity shall be ≤ 10 μmho/cm and the chloride ion concentration shall be ≤ 0.1 ppm.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 Safety/Relief Valve (S/RV) Bellows and Bellows Monitoring System

TLCO 3.4.2            The S/RV bellows and bellows monitoring system shall be OPERABLE for each required S/RV.

APPLICABILITY:    MODES 1, 2, and 3.

ACTIONS

-----NOTE-----  
Separate Condition entry is allowed for each S/RV bellows and bellows monitoring system.  
-----

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required S/RV bellows inoperable.	A.1    Declare the associated S/RV inoperable.	Immediately
B. One or more required S/RV bellows monitoring system inoperable.	B.1    Enter TLCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
TSR 3.4.2.1    Verify the integrity of each required S/RV bellows.	12 hours
TSR 3.4.2.2    Verify each required bellows monitoring system is OPERABLE	24 months
TSR 3.4.2.3    -----NOTE----- This TSR is a maintenance TSR only. Failure to perform this TSR does not result in the inoperability of the S/RV bellows or bellows monitoring system. -----  Disassemble and inspect two S/RVs.	24 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.3 Snubbers

TLCO 3.4.3 Each safety related snubber shall be OPERABLE. Nonsafety related snubbers whose failure, or failure of the associated system(s), would adversely affect any safety related system shall be OPERABLE.

APPLICABILITY: Whenever the supported system is required to be OPERABLE.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required snubbers inoperable.	A.1 Enter LCO 3.0.8.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
TSR 3.4.3.1 Perform snubber inservice inspections.	In accordance with Table 3.4.3-1

Table 3.4.3-1 (Page 1 of 2)  
Snubber Inservice Inspection Program

---

A. Visual Inspections

Snubbers are categorized as inaccessible or accessible during reactor operation. Each of these categories (inaccessible or accessible) may be inspected independently according to the schedule determined by Table 3.4.3-2. The visual inspection interval for each type of snubber shall be determined based upon the criteria provided in Table 3.4.3-2. The initial inspection interval for new types of snubbers shall be established at 24 months.

---

B. Visual Inspection Acceptance Criteria

Visual inspections shall verify that (1) the snubber has no visible indications of damage or impaired operability, (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 to be inoperable as a result of visual inspection shall be classified as unacceptable, but may be reclassified as acceptable for the purpose of establishing the next visual inspection interval, provided that (1) the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers, irrespective of type, that may be generically susceptible; and (2) the affected snubber is functionally tested in the as-found condition and determined OPERABLE Table 3.4.3-1 Section D.

A review and evaluation shall be performed and documented to justify continued operation with an unacceptable snubber. If continued operation cannot be justified, the snubber shall be declared inoperable and the action requirements shall be met.

---

C. Functional Tests

Functional testing of snubbers shall be conducted at least once per 24 months while in MODE 4. Ten percent of the total number of each brand of snubber shall be functionally tested either in place or in a bench test. For each snubber that does not meet the functional test acceptance criteria in Section D below, an additional ten percent of that brand shall be functionally tested until no more failures are found or all snubbers of that brand have been tested. The representative sample selected for functional testing shall include the various configurations, operating environments, and the range of size and capacity of the snubbers.

In addition to the regular sample and specified re-samples, snubbers which failed the previous functional test shall be retested during the next test period if they were reinstalled as a safety-related snubber. If a spare snubber has been installed in place of a failed safety related snubber, it shall be tested during the next period.

Table 3.4.3-1 (Page 2 of 2)  
Snubber Inservice Inspection Program

---

If any snubber selected for functional testing either fails to lockup or fails to move (i.e. frozen in place) the cause shall be evaluated and if caused by manufacturer or design deficiency, all snubbers of the same design subject to the same defect shall be functionally tested.

D. Hydraulic Snubbers Functional Test Acceptance Criteria

Hydraulic snubber functional tests shall verify that:

- a. Activation (restraining action) is achieved within the specified range of velocity or acceleration in both tension and compression; and
- b. Snubber bleed, or release rate, where required, is within the specified range in compression or tension.

---

E. Engineering Evaluations and Inspections

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

---

F. Snubber Service Life Monitoring

The installation and maintenance records for each safety related snubber shall be reviewed once every 24 months to verify that the indicated service life will not be exceeded prior to the next scheduled snubber service life review. If the indicated service life will be exceeded, the snubber service life shall be re-evaluated or the snubber shall be replaced or reconditioned to extend its service life beyond the date of the next scheduled service life review. This re-evaluation, replacement, or reconditioning shall be indicated in the records.

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Table 3.4.3-2 (Page 1 of 1)  
Snubber Visual Inspection Interval

Population or Category <sup>(a)(b)</sup>	NUMBER OF UNACCEPTABLE SNUBBERS		
	Column A Extend Interval <sup>(c)</sup>	Column B Repeat Interval <sup>(d)</sup>	Column C Reduce Interval <sup>(e)</sup>
1	0	0	1
80	0	0	2
100	0	1	4
150	0	3	8
200	2	5	13
300	5	12	25

- (a) The next visual inspection interval for a snubber population or category size shall be determined based upon the previous inspection interval and the number of unacceptable snubbers found during that interval. Snubbers may be categorized, based upon their accessibility during power operation, as accessible or inaccessible. These categories may be examined separately or jointly. However, that decision must be made and documented before any inspection and that decision shall be used as the basis upon which to determine the next inspection interval for that category.
- (b) Interpolation between population or category sizes and the number of unacceptable 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 unacceptable snubbers as determined by interpolation.
- (c) If the number of unacceptable snubbers is equal to or less than the number in Column A, the next inspection interval may be twice the previous interval but not greater than 48 months.
- (d) If the number of unacceptable snubbers is equal to or less than the number in Column B but greater than the number in Column A, the next inspection interval shall be the same as the previous interval.
- (e) If the number of unacceptable snubbers is equal to or greater than the number in Column C, the next inspection interval shall be two-thirds of the previous interval. However, if the number of unacceptable snubbers is less than the number in Column C but greater than the number in Column B, the next interval shall be reduced proportionally by interpolation, that is, the previous interval shall be reduced by a factor that is one-third of the ratio of the difference between the number of unacceptable snubbers found during the previous interval and the number in Column B to the difference in the numbers in Columns B and C.

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING SYSTEM (RCIC)

3.5.1 Automatic Depressurization System (ADS) Inhibit Switch

TLCO 3.5.1 Both ADS Inhibit switches shall be OPERABLE.

APPLICABILITY: MODE 1,  
MODES 2 and 3, with reactor steam dome pressure > 150 psig.

ACTIONS

-----NOTE-----  
Separate Condition entry is allowed for each ADS inhibit switch.  
-----

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TSR 3.5.1.1 not met for one or more ADS Inhibit Switches.	A.1 Declare the associated ADS instrumentation trip system channels inoperable.	Immediately
B. TSR 3.5.1.2 not met for one or more ADS Inhibit Switches	B.1 Enter TLCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
TSR 3.5.1.1 Verify each ADS Inhibit Switch does not prevent the ADS initiation capability when in the "Auto" position.	24 months
TSR 3.5.1.2 Verify each ADS Inhibit Switch will inhibit ADS initiation when in the "Inhibit" position.	24 months

### 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING SYSTEM (RCIC)

#### 3.5.2 Core Spray (CS) System Nozzle Differential Pressure Instrumentation

TLCO 3.5.2 Two CS System nozzle differential pressure channels shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

#### ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or both CS System nozzle differential pressure channels inoperable.	A.1 Initiate action to restore CS System nozzle differential pressure channel(s) to OPERABLE status.	Immediately

#### SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
TSR 3.5.2.1 Perform CHANNEL CHECK.	24 hours
TSR 3.5.2.2 Perform CHANNEL FUNCTIONAL TEST.	31 days
TSR 3.5.2.3 Perform CHANNEL CALIBRATION.	92 days

### 3.6 CONTAINMENT SYSTEMS

#### 3.6.1.3 Primary Containment Isolation Valves (PCIVs)

TLCO 3.6.1.3      TSR 3.6.1.3.1 and TSR 3.6.1.3.2 shall be met.

APPLICABILITY:    MODES 1, 2, and 3.

#### ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TSR 3.6.1.3.1 not met for one or more PCIVs.	A.1 Enter the applicable Conditions and Required Actions of LCO 3.6.1.3, "Primary Containment Isolation Valves."	Immediately
B. TSR 3.6.1.3.2 not met for one or more PCIVs.	B.1 Enter TLCO 3.0.3.	Immediately

#### SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
TSR 3.6.1.3.1    -----NOTE----- Only one main steam isolation valve (MSIV) should be tested at a time and THERMAL POWER must be < 75% RTP. ----- Test each normally open power operated PCIV in accordance with the Inservice Testing Program.	In accordance with the Inservice Testing Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
TSR 3.6.1.3.2    Exercise each MSIV by partial closure and subsequent reopening.	7 days

3.6 CONTAINMENT SYSTEMS

3.6.1.7 Suppression Chamber-to-Drywell Vacuum Breakers

TLCO 3.6.1.7      TSR 3.6.1.7.1 shall be met.

APPLICABILITY:    MODES 1, 2, and 3.

ACTIONS

-----NOTE-----  
Separate Condition entry is allowed for each suppression chamber-to-drywell vacuum breaker.  
-----

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TSR 3.6.1.7.1 not met for one or more suppression chamber-to-drywell vacuum breakers.	A.1    Enter TLCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
TSR 3.6.1.7.1    -----NOTE----- Primary containment access is required to perform this Surveillance. ----- Visually inspect each suppression chamber-to-drywell vacuum breaker.	24 months

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 Northern States Power (NSP) Transmission Lines

TLCO 3.8.1 Two NSP transmission lines and associated switchgear shall be OPERABLE to supply power to the offsite circuits required by LCO 3.8.1, "AC Sources - Operating." If the 1AR and 2R transformers are the required offsite circuits, the 1AR transformer must be powered from the 10 transformer.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required NSP transmission line and associated switchgear inoperable.	A.1 Verify, by administrative means, both emergency diesel generators (EDGs) are OPERABLE.	Immediately
	<u>AND</u> A.2 Restore required NSP transmission line and associated switchgear to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met.  <u>OR</u> Two required NSP transmission lines and associated switchgear inoperable.	B.1 Enter TLCO 3.0.3	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. The 10 transformer is not the source of power to the 1AR transformer when the 1AR and 2R transformers are required to be OPERABLE.	C.1 Declare the associated required qualified offsite circuit inoperable and enter applicable Conditions and Required Actions of LCO 3.8.1.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
TSR 3.8.1.1 The following Substation Switchyard Battery measurements shall be taken: <ul style="list-style-type: none"> <li>a. Pilot cell specific gravity and voltage;</li> <li>b. Temperature of cells adjacent to the pilot cell; and</li> <li>c. Overall battery voltage.</li> </ul>	7 days
TSR 3.8.1.2 The following Substation Switchyard Battery measurements shall be taken: <ul style="list-style-type: none"> <li>a. Voltage of each cell (to the nearest 0.01 volt);</li> <li>b. Specific gravity of each cell; and</li> <li>c. Temperature of every fifth cell.</li> </ul>	92 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 24 VDC Battery Systems

TLCO 3.8.2 Two 24 VDC battery subsystems (each consisting of one 24 VDC battery and battery charger) shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

**ACTIONS**

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two 24 VDC battery systems inoperable.	A.1 Declare the associated supported equipment inoperable.	Immediately

**SURVEILLANCE REQUIREMENTS**

SURVEILLANCE	FREQUENCY
TSR 3.8.2.1 For each 24 VDC battery subsystem, the following measurements shall be taken: a. Pilot cell specific gravity and voltage; b. Temperature of cells adjacent to the pilot cell; and c. Overall battery voltage.	7 days
TSR 3.8.2.2 For each 24 VDC battery subsystem, the following measurements shall be taken: a. Voltage of each cell (to the nearest 0.01 volt); b. Specific gravity of each cell; and c. Temperature of every fifth cell.	92 days

### 3.9 REFUELING OPERATIONS

#### 3.9.1 Decay Time

TLCO 3.9.1        The reactor shall be shutdown  $\geq 24$  hours.

APPLICABILITY:        During movement of fuel assemblies within the reactor pressure vessel (RPV).

#### ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Reactor shutdown for < 24 hours.	A.1 Suspend movement of fuel assemblies within the RPV.	Immediately

#### SURVEILLANCE REQUIREMENTS

None.

## 5.0 ADMINISTRATIVE CONTROLS

### 5.2 Organization

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5.2.1 Each duty shift shall be composed of at least the minimum licensed operator shift crew composition shown in Table 5.2-1.

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Table 5.2-1 (Page 1 of 1)  
Minimum Licensed Operator Shift Crew Composition

CATEGORY	APPLICABLE PLANT CONDITIONS	
	MODES 4 and 5	MODES 1, 2 <sup>(b)</sup> , and 3
Number of Senior Operators	1 <sup>(a)</sup>	2 <sup>(c)</sup>
Total number of Operators (Senior Operators and Operators)	2	4

- (a) Does not include the Senior Operator or the Senior Operator limited to Fuel Handling who is supervising alterations of the reactor core.
- (b) Except for momentary switching of the reactor mode switch to Startup/Hot Standby position for testing.
- (c) One Senior Operator shall be in the control room or the shift supervisor's office at all times when the reactor is in MODE 1, 2, or 3. At least 50% of the time, a Senior Operator shall actually be in the control room proper when the reactor is in the MODE 1, 2, or 3.

APPENDIX A (Page 1 of 1)  
Control Rod Scram Times Limits For Reactor Pressures at 0 psig

NOTCH POSITION	SCRAM TIMES <sup>(a)</sup> (seconds) WHEN REACTOR STEAM DOME PRESSURE AT 0 psig
46	0.414
36	0.803
26	1.297
06	2.293

(a) Maximum scram time from fully withdrawn position based on de-energization of scram pilot valve solenoids at time zero.

TRM Appendix B  
Secondary Containment Isolation Valves (SCIVs)

Appendix B (Page 1 of 2)  
Secondary Containment Isolation Valves (SCIVs)

Valve	Location	Isolation Time (if applicable)
A. Automatic SCIVs		
V-D-11	Duct from SBGT Room (Division I)	10 seconds
V-D-12	Duct from SBGT Room (Division II)	10 seconds
V-D-13	Duct from SBGT Room (Division I)	10 seconds
V-D-14	Duct from SBGT Room (Division II)	10 seconds
V-D-23	Duct to V-EF-10 (Division I)	10 seconds
V-D-24	Duct to V-EF-10 (Division II)	10 seconds
V-D-25	Duct to V-EF-28 (Division I)	10 seconds
V-D-26	Duct to V-EF-28 (Division II)	10 seconds
V-D-39	Duct to V-EF-24A and V-EF-24B (Division I)	10 seconds
V-D-40	Duct to V-EF-24A and V-EF-24B (Division II)	10 seconds
V-D-57	Double Isolation Dampers on V-AC-10A (Division I)	10 seconds
V-D-58	Double Isolation Dampers on V-AC-10A (Division II)	10 seconds
V-D-59	Double Isolation Dampers on V-AC-10B (Division II)	10 seconds
V-D-60	Double Isolation Dampers on V-AC-10B (Division I)	10 seconds
V-D-61	Double Isolation Dampers on V-AH-4A (Division I)	10 seconds
V-D-62	Double Isolation Dampers on V-AH-4A (Division II)	10 seconds
V-D-63	Double Isolation Dampers on V-AH-4B (Division II)	10 seconds
V-D-64	Double Isolation Dampers on V-AH-4B (Division I)	10 seconds
BV-8203-4	Exhaust Pipe from C-1006A/C-1006B (Division I)	10 seconds
BV-8203-5	Exhaust Pipe from C-1006A/C-1006B (Division II)	10 seconds
AO-2982	Duct to Main Exhaust Plenum Room	10 seconds

TRM Appendix B  
Secondary Containment Isolation Valves (SCIVs)

Appendix B (Page 2 of 2)  
Secondary Containment Isolation Valves (SCIVs)

Valve	Location	Isolation Time (if applicable)
<b>B. Manual SCIVs</b>		
V-D-65	Fuel Pool Filter/Demin (T-47A)	NA
V-D-66	Fuel Pool Filter/Demin (T-47A)	NA
V-D-67	Fuel Pool Filter/Demin (T-47B)	NA
V-D-68	Fuel Pool Filter/Demin (T-47B)	NA
V-D-69	Floor Drain Filter (T-27)	NA
V-D-70	Floor Drain Filter (T-27)	NA
V-D-71	Waste Collector Filter (T-25)	NA
V-D-72	Waste Collector Filter (T-25)	NA
V-D-73	Waste Collector Demineralizer (T-65)	NA
V-D-74	Waste Collector Demineralizer (T-65)	NA
V-D-75	Cleanup Filter/Demin (T-202A)	NA
V-D-76	Cleanup Filter/Demin (T-202A)	NA
V-D-77	Cleanup Filter/Demin (T-202B)	NA
V-D-78	Cleanup Filter/Demin (T-202B)	NA

APPENDIX C (Page 1 of 3)  
Setpoint Methodology and Nominal Trip Setpoints for Selected ITS Functions

Nominal Trip Setpoints

ITS Table and Function Number	Nominal Trip Setpoint (NTSP)
Table 3.3.5.1-1 Functions 1.c, 2.c	420 psig
Table 3.3.5.1-1 Functions 1.d, 2.d	420 psig
Table 3.3.5.1-1 Functions 4.c, 5.c	100 psig
Table 3.3.5.1-1 Functions 4.d, 5.d	100 psig

As-Left Methodology

ITS Table 3.3.5.1-1, Functions 1.c, 1.d, 2.c, 2.d, 4.d, and 5.d

The As Left tolerances (ALT) for these Functions were established in accordance with the guidance provided in ESM-03.02-APP-I: "This is an arbitrary term that is used in the calibration or surveillance procedure. If not defined in procedures, the following equation can be used as a guideline:  $ALT = 3/2 \times VA$ ."

The selection of an ALT is not considered critical in the General Electric (GE) setpoint methodology as long as the established ALT is included when calculating the Allowable Values (AV) and NTSPs. Therefore the methodology provides only limited guidance on establishing ALTs. For these Functions, the existing plant ALTs were used in the setpoint calculations. These ALTs are within the ALTs that would be determined with the above guidance.

ITS Table 3.3.5.1-1 Functions 4.c, 5.c

The ALTs for these Functions were established in accordance with the guidance provided in ESM-03.02-APP-I: "This is an arbitrary term that is used in the calibration or surveillance procedure. If not defined in procedures, the following equation can be used as a guideline:  $ALT = 3/2 \times VA$ ."

The selection of an ALT is not considered critical in the GE setpoint methodology as long as the established ALT is included when calculating the AVs and NTSPs. Therefore the methodology provides only limited guidance on establishing ALTs. For these Functions, the existing plant ALTs were determined to be too restrictive and were increased in order to provide greater ease in the calibration process. The established ALTs are within the ALTs that would be determined with the above guidance.

APPENDIX C (Page 2 of 3)  
Setpoint Methodology and Nominal Trip Setpoints for Selected ITS Functions

As-Found Methodology

ITS Table 3.3.5.1-1, Functions 1.c, 1.d, 2.c, and 2.d

The As Found tolerances (AFT) for these Functions were established in accordance with the guidance provided in ESM-03.02-APP-I: "As Found Tolerances (AFT) should be determined for each device in the instrument channel. The AFT should account for all effects measurable during calibration. Two suggested ways for determining the AFT are:

$$AFT_1 = (3/2) (VA^2 + VD^2 + DTE^2)^{1/2}; \text{ or}$$

$$AFT_2 = (VA^2 + VD^2 + DTE^2 + CL^2)^{1/2}.$$

When available, As Left/As Found trending data could be used to determine the AFT limits. The AFT for each device must bound the ALT, but must not exceed the AV. The AFT is normally an indication of expected instrument performance and not an indication of AV violation."

The selection of an AFT is not included in the GE setpoint methodology as the instrument is considered operational as long as the measured as-found value is more conservative than the AV. The above equations are included in the Monticello Nuclear Generating Plant (MNGP) methodology to provide an indication of expected instrument performance. The first equation provides an approximate 3-sigma AFT (as-found measurement expected to be within the AFT 99% of the time). The second equation provides an approximate 2-sigma AFT (as-found measurement expected to be within the AFT 95% of the time).

AFTs for these Functions were established using the AFT<sub>1</sub> equation.

ITS Table 3.3.5.1-1, Functions 4.c, 4.d, 5.c, and 5.d

The AFTs for these Functions were established in accordance with the guidance provided in ESM-03.02-APP-I: "As Found Tolerances (AFT) should be determined for each device in the instrument channel. The AFT should account for all effects measurable during calibration. Two suggested ways for determining the AFT are:

$$AFT_1 = (3/2) (VA^2 + VD^2 + DTE^2)^{1/2}; \text{ or}$$

$$AFT_2 = (VA^2 + VD^2 + DTE^2 + CL^2)^{1/2}.$$

When available, As Left/As Found trending data could be used to determine the AFT limits. The AFT for each device must bound the ALT, but must not exceed the AV. The AFT is normally an indication of expected instrument performance and not an indication of AV violation."

APPENDIX C (Page 3 of 3)  
Setpoint Methodology and Nominal Trip Setpoints for Selected ITS Functions

As-Found Methodology (continued)

The selection of an AFT is not included in the GE setpoint methodology as the instrument is considered operational as long as the measured as-found value is more conservative than the AV. The above equations are included in the MNGP methodology to provide an indication of expected instrument performance. The first equation provides an approximate 3-sigma AFT (as-found measurement expected to be within the AFT 99% of the time). The second equation provides an approximate 2-sigma AFT (as-found measurement expected to be within the AFT 95% of the time).

AFTs for these Functions were established using the  $AFT_2$  equation.

MONTICELLO NUCLEAR  
GENERATING PLANT  
TECHNICAL REQUIREMENTS  
MANUAL BASES

**TABLE 1 (Page 1 of 1)**  
**MONTICELLO NUCLEAR GENERATING PLANT**  
**TRM BASES LIST OF EFFECTIVE SECTIONS/SPECIFICATIONS**

<u>Section/Specification</u>	<u>Revision No.</u>
B 3.0	0
B 3.3.1.1	0
B 3.3.2.1	0
B 3.3.3.1	0
B 3.3.4.1	0
B 3.3.5.1	0
B 3.3.7.1	1
B 3.4.1	0
B 3.4.2	0
B 3.4.3	0
B 3.5.1	0
B 3.5.2	0
B 3.6.1.3	0
B 3.6.1.7	0
B 3.8.1	0
B 3.8.2	0
B 3.9.1	0

**TABLE 2 (Page 1 of 1)**  
**TRM BASES RECORD OF REVISIONS**

<b>Revision Number</b>	<b>Affected Section/ Specification</b>	<b>Description of Revision</b>
0	All	Original TRM Bases Issuance
1	B 3.3.7.1	License Amendment 148 removed the Control Room Air Intake Radiation Monitors from Technical Specification 3.3.7.1. The monitors were added to the TRM as new Specification 3.3.7.1 as required by NRC Commitment M06030A.

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B 3.0	TECHNICAL LIMITING CONDITION FOR OPERATION (TLCO) APPLICABILITY	B 3.0-1
B 3.0	TECHNICAL SURVEILLANCE REQUIREMENT (TSR) APPLICABILITY .....	B 3.0-7
B 3.1	Not Used	
B 3.2	Not Used	
B 3.3	INSTRUMENTATION	
B 3.3.1.1	Turbine Condenser Vacuum - Low Instrumentation .....	B 3.3.1.1-1
B 3.3.2.1	Control Rod Block Instrumentation.....	B 3.3.2.1-1
B 3.3.3.1	Post Accident Monitoring (PAM) Instrumentation.....	B 3.3.3.1-1
B 3.3.4.1	Anticipated Transient Without Scram (ATWS) Alternate Rod Injection Instrumentation .....	B 3.3.4.1-1
B 3.3.5.1	Loss of Auxiliary Power Instrumentation .....	B 3.3.5.1-1
B 3.3.7.1	Control Room Air Intake Radiation - High Instrumentation.....	B 3.3.7.1-1
B 3.4	REACTOR COOLANT SYSTEM (RCS)	
B 3.4.1	RCS Chemistry.....	B 3.4.1-1
B 3.4.2	Safety/Relief Valve (S/RV) Bellows and Bellows Monitoring System.....	B 3.4.2-1
B 3.4.3	Snubbers .....	B 3.4.3-1
B 3.5	EMERGENCY CORE COOLING SYSTEM (ECCS)	
B 3.5.1	Automatic Depressurization System (ADS) Inhibit Switch.....	B 3.5.1-1
B 3.5.2	Core Spray (CS) System Nozzle Differential Pressure Instrumentation...	B 3.5.2-1
B 3.6	CONTAINMENT SYSTEMS	
B 3.6.1.3	Primary Containment Isolation Valves (PCIVs).....	B 3.6.1.3-1
B 3.6.1.7	Suppression Chamber-to-Drywell Vacuum Breakers.....	B 3.6.1.7-1
B 3.7	Not Used	
B 3.8	ELECTRICAL POWER SYSTEMS	
B 3.8.1	Northern States Power (NSP) Transmission Lines .....	B 3.8.1-1
B 3.8.2	24 Volt Battery Systems .....	B 3.8.2-1
B 3.9	REFUELING OPERATIONS	
B 3.9.1	Decay Time .....	B 3.9.1-1

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### 3.0 TECHNICAL LIMITING CONDITION FOR OPERATION (TLCO) APPLICABILITY

#### BASES

TLCOs	TLCO 3.0.1 through TLCO 3.0.5 establish the general requirements applicable to all TLCOs in Sections 3.1 through 3.10 and apply at all times, unless otherwise stated.
TLCO 3.0.1	TLCO 3.0.1 establishes the Applicability statement within each individual Requirement as the requirement for when the TLCO is required to be met (i.e., when the unit is in the MODES or other specified conditions of the Applicability statement of each Requirement).
TLCO 3.0.2	<p>TLCO 3.0.2 establishes that upon discovery of a failure to meet a TLCO, the associated ACTIONS shall be met. The Completion Time of each Required Action for an ACTIONS Condition is applicable from the point in time that an ACTIONS Condition is entered. The Required Actions establish those remedial measures that must be taken within specified Completion Times when the requirements of a TLCO are not met. This Requirement establishes that:</p> <ol style="list-style-type: none"> <li>a. Completion of the Required Actions within the specified Completion Times constitute compliance with a Requirement; and</li> <li>b. Completion of the Required Actions is not required when a TLCO is met within the specified Completion Time, unless otherwise specified.</li> </ol>

There are two basic types of Required Actions. The first type of Required Action specifies a time limit in which the TLCO must be met. This time limit is the Completion Time to restore an inoperable system or component to OPERABLE status or to restore variables to within specified limits. If this type of Required Action is not completed within the specified Completion Time, a shutdown may be required to place the unit in a MODE or condition in which the Requirement is not applicable. (Whether stated as a Required Action or not, correction of the entered Condition is an action that may always be considered upon entering ACTIONS.) The second type of Required Action specifies the remedial measures that permit continued operation of the unit that is not further restricted by the Completion Time. In this case, compliance with the Required Actions provides an acceptable justification for continued operation.

Completing the Required Actions is not required when a TLCO is met or is no longer applicable, unless otherwise stated in the individual Requirement.

BASES

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TLCO 3.0.2 (continued)

The nature of some Required Actions of some Conditions necessitates that, once the Condition is entered, the Required Actions must be completed even though the associated Conditions no longer exist. The individual TLCO's ACTIONS specify the Required Actions where this is the case. An example of this is in TLCO 3.4.3, "Snubbers."

The Completion Times of the Required Actions are also applicable when a system or component is removed from service intentionally. The reasons for intentionally relying on the ACTIONS include, but are not limited to, performance of TSRs, preventive maintenance, corrective maintenance, or investigation of operational problems. Entering ACTIONS for these reasons must be done in a manner that does not compromise safety. Individual Requirements may specify a time limit for performing a TSR when equipment is removed from service or bypassed for testing. In this case, the Completion Times of the Required Actions are applicable when this time limit expires, if the equipment remains removed from service or bypassed.

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 Requirement becomes applicable. In this case, the Completion Times of the associated Required Actions would apply from the point in time that the new Requirement becomes applicable and the ACTIONS Condition(s) are entered.

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TLCO 3.0.3

TLCO 3.0.3 establishes the actions that must be implemented when a TLCO is not met and:

- a. An associated Required Action and Completion Time is not met and no other Condition applies; or
- b. The condition of the unit is not specifically addressed by the associated ACTIONS. This means that no combination of Conditions stated in the ACTIONS can be made that exactly corresponds to the actual condition of the unit. Sometimes, possible combinations of Conditions are such that entering TLCO 3.0.3 is warranted; in such cases, the ACTIONS specifically state a Condition corresponding to such combinations and also that TLCO 3.0.3 be entered immediately.

This Requirement delineates the time limits for evaluating impacts on safety function and if the plant is in an unanalyzed condition, as well as time limits for establishing compensatory actions when operation cannot be maintained within the limits for safe operation as defined by the TLCO and its ACTIONS.

BASES

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TLCO 3.0.3 (continued)

Upon entering TLCO 3.0.3, 1 hour is allowed to initiate action to implement appropriate compensatory actions, to verify the unit is not in an unanalyzed condition, and to verify that a required safety function is not compromised. Within 12 hours, the Operation Manager's approval of the compensatory actions and the plan for exiting TLCO 3.0.3 must be obtained. The use and interpretation of specific times to complete the actions of TLCO 3.0.3 are consistent with the discussion of Section 1.3, "Completion Times."

When determining if the plant is in an unanalyzed condition and when determining if a required safety function is not compromised by the inoperabilities, Technical Specification requirements need to be considered.

The actions required in accordance with TLCO 3.0.3 may be terminated and TLCO 3.0.3 exited if any of the following occurs:

- a. The TLCO is now met;
- b. A Condition exists for which the Required Actions have now been performed; or
- c. ACTIONS exist that do not have expired Completion Times. These Completion Times are applicable from the point in time that the Condition is initially entered and not from the time TLCO 3.0.3 is exited.

Exceptions to TLCO 3.0.3 are addressed in the individual Requirements.

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TLCO 3.0.4

TLCO 3.0.4 establishes limitations on changes in MODES or other specified conditions in the Applicability when a TLCO is not met. It allows placing the unit in a MODE or other specified condition stated in that Applicability (i.e., the Applicability desired to be entered) when unit conditions are such that the requirements of the TLCO would not be met, in accordance with TLCO 3.0.4.a, TLCO 3.0.4.b, or TLCO 3.0.4.c.

TLCO 3.0.4.a allows entry into a MODE or other specified condition in the Applicability with the TLCO not met when the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time. 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

## BASES

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### TLCO 3.0.4 (continued)

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 in the Applicability may be made in accordance with the provisions of the Required Actions.

TLCO 3.0.4.b allows entry into a MODE or other specified condition in the Applicability with the TLCO not met after performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate.

The risk assessment may use quantitative, qualitative, or blended approaches, and the risk assessment will be conducted using the plant program, procedures, and criteria in place to implement 10 CFR 50.65(a)(4), which requires that risk impacts of maintenance activities to be assessed and managed. The risk assessment, for the purposes of TLCO 3.0.4.b, must take into account all inoperable Technical Specification equipment regardless of whether the equipment is included in the normal 10 CFR 50.65(a)(4) risk assessment scope. The risk assessments will be conducted using the procedures and guidance endorsed by Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants." Regulatory Guide 1.182 endorses the guidance in Section 11 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." These documents address general guidance for conduct of the risk assessment, quantitative and qualitative guidelines for establishing risk management actions, and example risk management actions. These include actions to plan and conduct other activities in a manner that controls overall risk, increased risk awareness by shift and management personnel, actions to reduce the duration of the condition, actions to minimize the magnitude of risk increases (establishment of backup success paths or compensatory measures), and determination that the proposed MODE change is acceptable. Consideration should also be given to the probability of completing restoration such that the requirements of the TLCO would be met prior to the expiration of ACTIONS Completion Times that would require exiting the Applicability.

TLCO 3.0.4.b may be used with single, or multiple systems and components unavailable. NUMARC 93-01 provides guidance relative to consideration of simultaneous unavailability of multiple systems and components.

BASES

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TLCO 3.0.4 (continued)

The results of the risk assessment shall be considered in determining the acceptability of entering the MODE or other specified condition in the Applicability, and any corresponding risk management actions. The TLCO 3.0.4.b risk assessments do not have to be documented. The TLCOs allow continued operation with equipment unavailable in MODE 1 for the duration of the Completion Time. Since this is allowable, and since in general the risk impact in that particular MODE bounds the risk of transitioning into and through the applicable MODES or other specified conditions in the Applicability of the TLCO, the use of the TLCO 3.0.4.b allowance should be generally acceptable, as long as the risk is assessed and managed as stated above.

TLCO 3.0.4.c allows entry into a MODE or other specified condition in the Applicability with the TLCO not met based on a Note in the Requirement which states TLCO 3.0.4.c is applicable. These specific allowances permit entry into MODES or other specified conditions in the Applicability when the associated ACTIONS to be entered do not provide for continued operation for an unlimited period of time and a risk assessment has not been performed. This allowance may apply to all the ACTIONS or to a specific Required Action of a Requirement. The risk assessments performed to justify the use of TLCO 3.0.4.b usually only consider systems and components. For this reason, TLCO 3.0.4.c is typically applied to Requirements which describe values and parameters.

The provisions of this Requirement 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.

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TLCO 3.0.5

TLCO 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 ACTIONS. The sole purpose of this Requirement is to provide an exception to TLCO 3.0.2 (e.g., to not comply with the applicable Required Action(s)) to allow the performance of required testing to demonstrate:

- a. The OPERABILITY of the equipment being returned to service; or
- b. The OPERABILITY of other equipment.

The administrative controls ensure the time the equipment is returned to service in conflict with the requirements of the ACTIONS is limited to the time absolutely necessary to perform the required testing to demonstrate OPERABILITY. This Requirement does not provide time to perform any other preventive or corrective maintenance.

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## B 3.0 TECHNICAL SURVEILLANCE REQUIREMENT (TSR) APPLICABILITY

### BASES

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TSRs	TSR 3.0.1 through TSR 3.0.4 establish the general requirements applicable to all TSRs in Sections 3.1 through 3.10 and apply at all times, unless otherwise stated.
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TSR 3.0.1	TSR 3.0.1 establishes the requirement that TSRs must be met during the MODES or other specified conditions in the Applicability for which the requirements of the TLCOs apply, unless otherwise specified in the individual TSRs. This TSR is to ensure that TSRs are performed to verify the OPERABILITY of systems and components, and that variables are within specified limits. Failure to meet a TSR within the specified Frequency, in accordance with TSR 3.0.2, constitutes a failure to meet a TLCO.
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Systems and components are assumed to be OPERABLE when the associated TSRs have been met. Nothing in this TSR, however, is to be construed as implying that systems or components are OPERABLE when:

- a. The systems or components are known to be inoperable, although still meeting the TSRs; or
- b. The requirements of the TSR(s) are known not to be met between required TSR performances.

TSRs do not have to be performed when the unit is in a MODE or other specified condition for which the requirements of the associated TLCO are not applicable, unless otherwise specified.

Unplanned events may satisfy the requirements (including applicable acceptance criteria) for a given TSR. In this case, the unplanned event may be credited as fulfilling the performance of the TSR.

TSRs, including TSRs invoked by Required Actions, do not have to be performed on inoperable equipment because the ACTIONS define the remedial measures that apply. TSRs have to be met and performed in accordance with TSR 3.0.2, prior to returning equipment to OPERABLE status.

Upon completion of maintenance, appropriate post maintenance testing is required to declare equipment OPERABLE. This includes ensuring applicable TSRs are not failed and their most recent performance is in accordance with TSR 3.0.2. Post maintenance testing may not be possible in the current MODE or other specified conditions in the Applicability due to the necessary unit parameters not having been established. In these situations, the equipment may be considered

## BASES

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### TSR 3.0.1 (continued)

OPERABLE provided testing has been satisfactorily completed to the extent possible and the equipment is not otherwise believed to be incapable of performing its function. This will allow operation to proceed to a MODE or other specified condition where other necessary post maintenance testing can be completed.

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### TSR 3.0.2

TSR 3.0.2 establishes the requirements for meeting the specified Frequency for TSRs and any Required Action with a Completion Time that requires the periodic performance of the Required Action on a "once per . . ." interval.

TSR 3.0.2 permits a 25% extension of the interval specified in the Frequency. This extension facilitates TSR scheduling and considers plant operating conditions that may not be suitable for conducting the TSR (e.g., transient conditions or other ongoing TSR or maintenance activities).

The 25% extension does not significantly degrade the reliability that results from performing the TSR at its specified Frequency. This is based on the recognition that the most probable result of any particular TSR being performed is the verification of conformance with the TSRs. The exception to TSR 3.0.2 are those TSRs for which the 25% extension of the interval specified in the Frequency does not apply. These exceptions are stated in the individual TSRs. The requirements of regulations take precedence over the TRM. The TRM cannot in and of itself extend a test interval specified in the regulations.

As stated in TSR 3.0.2, the 25% extension also does not apply to the initial portion of a periodic Completion Time that requires performance on a "once per . . ." basis. The 25% extension applies to each performance after the initial performance. The initial performance of the Required Action, whether it is a particular TSR or some other remedial action, is considered a single action with a single Completion Time. One reason for not allowing the 25% extension to this Completion Time is that such an action usually verifies that no loss of function has occurred by checking the status of redundant or diverse components or accomplishes the function of the inoperable equipment in an alternative manner.

The provisions of TSR 3.0.2 are not intended to be used repeatedly merely as an operational convenience to extend TSR intervals (other than those consistent with refueling intervals) or periodic Completion Time intervals beyond those specified.

## BASES

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### TSR 3.0.3

TSR 3.0.3 establishes the flexibility to defer declaring affected equipment inoperable or an affected variable outside the specified limits when a TSR 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 it is discovered that the TSR has not been performed in accordance with TSR 3.0.2, and not at the time that the specified frequency was not met.

This delay period provides adequate time to complete TSRs that have been missed. This delay period permits the completion of a TSR before complying with Required Actions or other remedial measures that might preclude completion of the TSR.

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

When a TSR with a Frequency based not on time intervals, but upon specified unit conditions or operational situations (e.g., prior to entering MODE 1 after each fueling loading), is discovered not to have been performed when specified, TSR 3.0.3 allows the full delay period of up to the specified frequency to perform the TSR. However, since there is not a time interval specified, the missed TSR should be performed at the first reasonable opportunity.

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

Failure to comply with specified Frequencies for TSRs is expected to be an infrequent occurrence. Use of the delay period established by TSR 3.0.3 is a flexibility which is not intended to be used as an operational convenience to extend TSR intervals. While up to 24 hours or the limit of the specified Frequency is provided to perform the missed TSR, it is expected that the missed TSR will be performed at the first reasonable opportunity. The determination of the first reasonable opportunity should include consideration of the impact on unit risk (from delaying the TSR as well as any unit configuration changes required or shutting the unit down to perform the TSR) and impact on any analysis assumptions, in addition to unit conditions, planning, availability of personnel, and the time required to perform the TSR. This risk impact should be managed through the program in place to implement 10 CFR 50.65(a)(4) and its implementation guidance Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants." This Regulatory Guide addresses

BASES

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TSR 3.0.3 (continued)

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 TSR 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 TSRs 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 TSRs will be placed in the licensee's Corrective Action Program.

If a TSR is not completed within the allowed delay period, then the equipment is considered inoperable or the variable then is considered outside the specified limits and the Completion Times of the Required Actions for the applicable TLCO Conditions begin immediately upon expiration of the delay period. If a TSR 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 TLCO Conditions begin immediately upon the failure of the TSR.

Completion of the TSR within the delay period allowed by this TSR, or within the Completion Time of the ACTIONS, restores compliance with TSR 3.0.1.

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TSR 3.0.4

TSR 3.0.4 establishes the requirement that all applicable TSRs must be met before entry into a MODE or other specified condition in the Applicability.

This TSR ensures that system and component OPERABILITY requirements and variable limits are met before entry into MODES or other specified conditions in the Applicability for which these system and components ensure safe operation of the unit. The provisions of this TSR 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.

A provision is included to allow entry into a MODE or other specified Condition in the Applicability when a TLCO is not met due to a TSR not being met in accordance with TLCO 3.0.4. However, in certain circumstances, failing to meet a TSR will not result in TSR 3.0.4 restricting a MODE change or other specified condition change. When a system, subsystem, division, component, device, or variable is inoperable

## BASES

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### TSR 3.0.4 (continued)

or outside its specified limits, the associated TSR(s) are not required to be performed, per TSR 3.0.1, which states that TSRs do not have to be performed on inoperable equipment. When equipment is inoperable, TSR 3.0.4 does not apply to the associated TSR(s) since the requirement for the TSR(s) to be performed is removed. Therefore, failing to perform the TSRs within the specified Frequency does not result in a TSR 3.0.4 restriction to changing MODES or other specified conditions of the Applicability. However, since the TLCO is not met in this instance, TLCO 3.0.4 will govern any restrictions that may (or may not) apply to MODE or other specified condition changes. TRS 3.0.4 does not restrict changing MODES or other specified conditions of the Applicability when a Surveillance has not been performed within the specified Frequency, provided the requirement to declare the TLCO not met has been delayed in accordance with TRS 3.0.3.

The provisions of TSR 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS. In addition, the provisions of TSR 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that result from any unit shutdown. In this context, a unit shutdown is defined as a change in MODE or other specified condition in the Applicability associated with transitioning from MODE 1 to MODE 2, MODE 2 to MODE 3, and MODE 3 to MODE 4.

The precise requirements for performance of TSRs are specified such that exceptions to TSR 3.0.4 are not necessary. The specific time frames and conditions necessary for meeting the TSRs are specified in the Frequency, in the TSR, or both. This allows performance of TSRs when the prerequisite condition(s) specified in a TSR procedure require entry into the MODE or other specified condition in the Applicability of the associated TLCO prior to the performance or completion of a TSR. A TSR that could not be performed until after entering the TLCO Applicability would have its Frequency specified such that it is not "due" until the specific conditions needed are met. Alternately, the TSR may be stated in the form of a Note as not required (to be met or performed) until a particular event, condition, or time has been reached. Further discussion of the specific formats of TSRs' annotation is found in Section 1.4, "Frequency."

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### 3.3 INSTRUMENTATION

#### B 3.3.1.1 Turbine Condenser Vacuum - Low Instrumentation

##### BASES

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Loss of condenser vacuum occurs when the condenser can no longer handle the heat input. Loss of condenser vacuum initiates a closure of the turbine stop valves and turbine bypass valves which eliminates the heat input to the condenser. Closure of the turbine stop and bypass valves causes a pressure transient, neutron flux rise, and an increase in surface heat flux. The condenser low vacuum scram is a back-up to the stop valve closure scram and causes a scram before the stop valves are closed and thus the resulting transient is less severe. Scram occurs at 21.5" Hg vacuum, stop valve closure occurs at 20" Hg vacuum, and bypass closure at 7" Hg vacuum.

The RPS is comprised of two independent trip system (A and B) with three logic channels in each trip system (logic channels A1, A2, and A3, B1, B2, and B3) as described in USAR, Section 7.6.1.2.5. The automatic trip logic of trip system A are logic channels A1 and A2; the automatic trip logic of trip system B are logic channels B1 and B2. The outputs of the automatic logic channels in a trip system are combined in a one-out-of-two logic so that either channel can trip the associated trip system. The tripping of both trip systems will produce a reactor scram. This logic arrangement is referred to as a one-out-of-two taken twice logic. For the Turbine Condenser Vacuum - Low Function, there are a total of two automatic channels per trip system with the same logic arrangement.

The Turbine Condenser Vacuum - Low Function channels are passive type device.

Although the operator will set the set points within the trip settings specified, the actual values of the various set points can differ appreciably from the value the operator is attempting to set. For power rerate, GE setpoint methodology provided in NEDC 31336, General Electric Setpoint Methodology, is used in establishing setpoints. The deviations could be caused by inherent instrument error, operator setting error, drift of the set point, etc. Therefore, such deviations have been accounted for in the various transient analyses.

If an unsafe failure is detected during surveillance testing, it is desirable to determine as soon as possible if other failures of a similar type have occurred and whether the particular function involved is still operable or capable of meeting the single failure criterion. To meet the requirements of the TRM, it is necessary that all instrument channels in one trip system be operable to permit testing in the other trip system. Thus, when failures are detected in the first trip system tested, they would have to be repaired before testing of the other system could begin. In the majority of cases, repairs or replacement can be accomplished quickly. If repair or replacement cannot be completed in a reasonable time, operation could continue with one tripped trip system until the surveillance testing deadline.

The ability to bypass one instrument channel when necessary to complete surveillance testing will preclude continued operation with scram functions which may be either unable to meet the single failure criterion or completely inoperable. It also eliminates the need for an unnecessary shutdown if the remaining channels are found to be operable. The conditions under which the bypass is permitted require an immediate determination that the particular function is Operable.

## BASES

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However, during the time a bypass is applied, the function will not meet the single failure criterion; therefore, it is prudent to limit the time the bypass is in effect by requiring that surveillance testing proceed on a continuous basis and that the bypass be removed as soon as testing is completed.

The turbine condenser low vacuum instrumentation will be functionally tested and calibrated at regularly scheduled intervals. Specific surveillance intervals and surveillance and maintenance outage times have been determined in accordance with NEDO-30851P, Technical Specification Improvement Analysis for BWR Reactor Protection System, as approved by the NRC and documented in the SER dated July 15, 1987 (letter to T A Pickens from A Thadani).

Experience with passive type instruments indicates that a yearly calibration is adequate. Where possible, however, quarterly calibration is performed. For those devices which employ amplifiers etc., drift specifications call for drift to be less than 0.5%/month; i.e., in the period of a month a drift of 0.5% would occur and thus provide for adequate margin.

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## B 3.3 INSTRUMENTATION

### B 3.3.2.1 Control Rod Block Instrumentation

#### BASES

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The control rod block functions are provided to prevent excessive control rod withdrawal so that MCPR remains above the Safety Limit (Technical Specification 2.1.1). The trip logic for this function is 1 out of n; e.g., any trip on one of the six APRM's, eight IRM's, four SRM's, or four scram discharge volume water level channels will result in a rod block. For each Control Rod Block Function, there are two trip systems. The scram discharge volume water level instrumentation includes two sensors on each of the two scram discharge volumes. This assures that no control rod is withdrawn unless enough capacity is available in either scram discharge volume to accommodate a scram. The setting is selected to initiate a rod block no later than the scram that is initiated on scram discharge volume high water level.

The minimum instrument channel requirements for the IRM may be reduced by one for a short period of time to allow for maintenance, testing, or calibration. See Section 7.3 FSAR.

The APRM rod block trip is referenced to flow and prevents operation significantly above the licensing basis power level especially during operation at reduced flow. The APRM provides gross core protection; i.e., limits the gross core power increase from withdrawal of control rods in the normal withdrawal sequence. The operator will set the APRM rod block trip settings no greater than that stated in Table 3.3.2.1-1. However, the actual setpoint can be as much as 3% greater than that stated in Table 3.3.2.1-1 for recirculation driving flows less than 50% of design and 2% greater than that shown for recirculation driving flows greater than 50% of design due to the deviations that could be caused by inherent instrument error, operator setting error, drift of the setpoint, etc.

The IRM rod block function provides local as well as gross core protection. The scaling arrangement is such that trip setting is less than a factor of 10 above the indicated level. Analysis of the worst case accident results in rod block action before MCPR approaches the Safety Limit (Technical Specification 2.1.1).

A downscale indication of an APRM or IRM is an indication the instrument has failed or the instrument is not sensitive enough. In either case the instrument will not respond to changes in control rod motion and thus control rod motion is prevented. The downscale rod blocks assure that there will be proper overlap between the neutron monitoring systems and thus, that adequate coverage is provided for all ranges of reactor operation. The downscale trips are set at 3/125 of full scale.

Although the operator will set the setpoints within the trip settings specified in Table 3.3.2.1-1, the actual values of the various set points can differ appreciably from the value the operator is attempting to set. The deviations could be caused by inherent instrument error, operator setting error, drift of the set point, etc. Therefore, these deviations have been accounted for in the various transient analyses.

BASES

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<u>Trip Function</u>	<u>Deviation</u>
IRM Downscale	- 2/125 of Scale
IRM Upscale	+ 2/125 of Scale
APRM Downscale	- 2/125 of Scale
APRM Upscale	+ 3% for recirculation driving flows < 50% of design + 2% for recirculation driving flows > 50% of design
Scram Discharge Volume-High Level	+ 1 gallon

The instrumentation in this section will be functionally tested and calibrated at regularly scheduled intervals. Although this instrumentation is not generally considered to be as important to plant safety as the Reactor Protection System, the same design reliability goals are applied. Where applicable, sensor checks are specified on a once/12 hours basis.

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### B 3.3 INSTRUMENTATION

#### B 3.3.3.1 Post Accident Monitoring (PAM) Instrumentation

##### BASES

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The OPERABILITY of the accident monitoring instrumentation ensures that sufficient information is available on selected plant parameters to monitor and assess these variables during and following an accident. This capability is consistent with the recommendations of NUREG-0578, TMI-2 Learned Task Force Status Report and Short Term Recommendations.

For the Safety/Relief Valve (S/RV) position (pressure switch) channels, the CHANNEL CHECK will consist of verifying the pressure switches are not tripped.

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### B 3.3 INSTRUMENTATION

#### B 3.3.4.1 Anticipated Transient Without Scram (ATWS) Alternate Rod Injection Instrumentation

##### BASES

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The ATWS Alternate Rod Injection consists of two independent trip systems, with two channels of Reactor Vessel Steam Dome Pressure - High and two channels of Reactor Vessel Water Level - Low Low in each trip system. Each ATWS Alternate Rod Injection trip system is a two-out-of-two logic for each Function. Thus, either two Reactor Vessel Water Level - Low Low or two Reactor Vessel Steam Dome Pressure - High signals are needed to trip a trip system. The outputs of the channels in a trip system are combined in a logic so that either trip system will cause all control rods to be inserted into the core. Each Reactor Vessel Water Level - Low Low output must remain below the setpoint for approximately 7 seconds for the channel output to provide an actuation signal to the associated trip system. Two solenoid valves are installed in the scram air header upstream of the hydraulic control units. Each of the two trip systems energizes a valve to vent the header and causes rod insertion. This greatly reduces the long term consequences of an ATWS event.

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### 3.3 INSTRUMENTATION

#### B 3.3.5.1 Loss of Auxiliary Power Instrumentation

##### BASES

No Bases information is provided.

## B 3.3 INSTRUMENTATION

### B 3.3.7.1 Control Room Air Intake Radiation - High Instrumentation

#### BASES

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The Control Room Air Intake Radiation Monitors measure radiation levels in the intake ducting of the control room envelope. In the event of increased radiation in the outside environment, the radiation monitors will automatically initiate the Control Room Emergency Filtration (CREF) System to provide protection for Control Room operators.

The Control Room Air Intake Radiation Monitor is not credited in any safety analysis. The monitor was removed from Tech Spec 3.3.7.1 by License Amendment 148, which also added four new signals to Tech Spec 3.3.7.1 (Reactor Vessel Water Level - Low Low, Drywell Pressure - High, Reactor Building Ventilation Exhaust Radiation - High, and Refueling Floor Radiation - High). These new signals are credited in the DBA safety analyses for initiation of the CREF System.

The Control Room Air Intake Radiation Monitor is maintained as an additional CREFS initiation signal for defense-in-depth. Inclusion in the Technical Requirements Manual satisfies NRC Commitment M06030A.

The CREF System has two trip systems. One trip system isolates the control room boundary and initiates one CREF subsystem while the other trip system also isolates the control room boundary and initiates the other CREF subsystem. Each trip system receives input from one Control Room Air Intake Radiation - High signal, as well as the signals discussed above. The Control Room Air Intake Radiation - High Function is arranged in a one-out-of-one logic. The channels include electronic equipment (e.g., relays) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a CREF System initiation signal to the initiation logic.

The Control Room Air Intake Radiation - High Function consists of two independent monitors. Two channels of Control Room Air Intake Radiation - High are available and are required to be OPERABLE to ensure that no single instrument failure can preclude CREF System initiation by the radiation monitors. Each channel must have its setpoint within the specified Allowable Value of SR 3.3.7.1.3. The Allowable Value for the Control Room Air Intake Radiation - High Function is set just above background to ensure that the control room operators are protected from increased radiation exposure.

The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. Nominal trip setpoints are specified in plant procedures. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Value between successive CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value.

BASES (continued)

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The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 8 hours, provided the associated Function maintains CREF System initiation capability. Upon completion of the Surveillance, or expiration of the 8 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the time required to perform the channel Surveillance.

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. The Frequency is based upon operating experience that demonstrates channel failure is rare.

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the channel will perform the intended function. The Frequency of 31 days is based on the known reliability of the equipment and the two channel redundancy available.

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. The Frequency is based upon operating experience, which has shown that these components usually pass the Surveillance when performed at the 24 month Frequency.

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### 3.4 REACTOR COOLANT SYSTEM (RCS)

#### B 3.4.1 RCS Chemistry

##### BASES

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Materials in the primary system are primarily 304 stainless steel and zircaloy. The reactor water chemistry limits are established to prevent damage to these materials. The limit placed on chloride concentration is to prevent stress corrosion cracking of the stainless steel.

When conductivity is in its proper normal range (approximately 10  $\mu\text{mho/cm}$  during reactor startup and 5  $\mu\text{mho/cm}$  during power operation), pH and chloride and other impurities affecting conductivity must also be within their normal range. When and if conductivity becomes abnormal, then chloride measurements are made to determine whether or not they are also out of their normal operating values. This would not necessarily be the case. Conductivity could be high due to the presence of a neutral salt, e.g.,  $\text{Na}_2\text{SO}_4$ , which would not have an effect on pH or chloride. In such a case, high conductivity alone is not a cause for shutdown. In some types of water-cooled reactors, conductivities are in fact high due to purposeful addition of additives. In the case of BWRs, however, no additives are used and where neutral pH is maintained, conductivity provides a very good measure of the quality of the reactor water. Significant changes therein provide the operator with a warning mechanism so he can investigate and remedy the condition causing the change before limiting conditions, with respect to variables affecting the boundaries of the reactor coolant, are exceeded. Methods available to the operator for correcting the off-standard condition include operation of the reactor cleanup system reducing the input of impurities and placing the reactor in the cold shutdown condition. The major benefit of cold shutdown is to reduce the temperature dependent corrosion rates and provide time for the cleanup system to reestablish the purity of the reactor coolant. During startup periods, which are in the category of less than 100,000 pounds per hour, conductivity may exceed 5  $\mu\text{mho/cm}$  because of the initial evolution of gases and the initial addition of dissolved metals. During this period of time when the conductivity exceeds 5  $\mu\text{mho}$  (other than short term spikes), samples will be taken to assure the chloride concentration is less than 0.1 ppm.

The conductivity of the reactor coolant is continuously monitored. The samples of the coolant which are taken every 96 hours will serve as a reference for calibration of these monitors and is considered adequate to assure accurate readings of the monitors. If conductivity is within its normal range, chlorides and other impurities will also be within their normal ranges. The reactor coolant samples will also be used to determine the chlorides. Therefore, the sampling frequency is considered adequate to detect long-term changes in the chloride ion content.

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### 3.4 REACTOR COOLANT SYSTEM (RCS)

#### B 3.4.2 Safety/Relief Valve (S/RV) Bellows and Bellows Monitoring System

##### BASES

Article 9, Section N-911.4(a)(4) of the ASME Pressure Vessel Code Section III Nuclear Vessels (1965 and 1968 editions) requires that safety/relief valve bellows be monitored for failure since this would defeat the self actuated safety function of the safety/relief valve.

Provision has been made to detect failure of the bellows monitoring system. Testing of this system once per 24 months provides assurance of bellows integrity.

## 3.4 REACTOR COOLANT SYSTEMS (RCS)

### B 3.4.3 Snubbers

#### BASES

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All safety related snubbers are required to be OPERABLE whenever the supported system is required to be OPERABLE. The Technical Requirements for Operation is based on ensuring 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 non-safety 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.

The visual inspection frequency is based upon maintaining a constant level of snubber protection to systems. Therefore, the required inspection interval is determined by the sample population size and the number of inoperable snubbers found during an inspection. Inspections performed before that interval has elapsed may be used as the new reference point to determine the next inspection. However, the results of such early inspections performed before the original required time interval has elapsed 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 feature directly related to rejection of the snubber.

When a snubber is found inoperable, an engineering evaluation or inspection 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 the inoperability of the snubber. The evaluation or inspection will determine whether or not the snubber mode of failure has imparted a significant effect or degradation on the supported component or system.

To provide assurance of snubber functional reliability, a representative sample of 10% of the installed snubbers will be functionally tested during plant shutdowns at intervals of no more than 24 months. Observed failures of these sample snubbers will require functional testing of additional units.

The service life of a snubber is evaluated via manufacturer input and through consideration of the snubber service conditions and associated installation and maintenance records (newly installed snubber, seal replaced, spring replaced, in high radiation area, in high temperature area, etc. . .). The requirement to monitor the snubber service life is included to ensure that the snubbers periodically undergo a performance evaluation in view of their age and operating conditions. These records will provide statistical bases for future consideration of snubber service life.

BASES (continued)

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All safety-related snubbers installed or planned for use at Monticello are hydraulic snubbers. No mechanical snubbers are used on safety-related systems at Monticello. If installed in the future, appropriate TRM changes must be made prior to installation.

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### 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING SYSTEM (RCIC)

#### B 3.5.1 Automatic Depressurization System (ADS) Inhibit Switch

BASES

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No Bases information is provided.

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3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION  
COOLING SYSTEM (RCIC)

B 3.5.2 Core Spray (CS) System Nozzle Differential Pressure Instrumentation

BASES

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No Bases information is provided.

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### 3.6 CONTAINMENT SYSTEMS

#### B 3.6.1.3 Primary Containment Isolation Valves (PCIVs)

##### BASES

No Bases information is provided.

### 3.6 CONTAINMENT SYSTEMS

#### B 3.6.1.7 Suppression Chamber-to-Drywell Vacuum Breakers

##### BASES

No Bases information is provided.

### 3.8 ELECTRICAL POWER SYSTEMS

#### B 3.8.1 Northern States Power (NSP) Transmission Lines

##### BASES

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No Bases information is provided.

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### 3.8 ELECTRICAL POWER SYSTEMS

#### B 3.8.2 24 VDC Battery Systems

##### BASES

No Bases information is provided.

### 3.9 REFUELING OPERATIONS

#### B 3.9.1 Decay Time

##### BASES

A minimum shutdown period of 24 hours is specified prior to movement of fuel within the reactor since analysis of refueling accidents assume a 24-hour decay time following extended operation at power. Since the reactor must be shut down, depressurized, and the head removed prior to moving fuel, it is not expected that fuel could actually be moved in less than 24 hours.