MONTICELLO NUCLEAR GENERATING PLANT TECHNICAL REQUIREMENTS MANUAL

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MONTICELLO NUCLEAR GENERATING PLANT
TRM LIST OF EFFECTIVE SECTIONS/SPECIFICATIONS

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TRM RECORD OF REVISIONS

Revision Number	Affected Section/ Specification	Description of Revision
0	All	Original TRM Bases Issuance
1	3.3.7.1	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.
3	3.4.3	Revised specification to incorporate ASME OM Code – 1995, 1996 Addenda and Code Case OMN-13 for visual inspection of snubbers. Removed Table 3.4.3-2. Changed surveillance frequency from referring to Table 3.4.3-1 to the Snubber Inservice Inspection Program.
4	3.4.3	Revised specification to remove incorrect MODE 4 restriction from Table 3.4.3-1 under Item C for functional testing of snubbers.
5	3.3.2.1	Amendment 159 – incorporated PRNMS TRM specification changes. Revised APRM functions in Table 3.3.2.1-1 to include APRM STP – High and Neutron Flux – High (Setdown) rod blocks. Added new SR 3.3.2.1.6 and SR 3.3.2.1.7.
6	3.5.2	Revised Specification to add a Note providing a 6-hour delay to entry into the Required Action solely for surveillance performance.
	Appendix C	Amendment 159 and 161 – Revised to clarify the methodologies for the determination of the NSTP values for several PRNMS functions and the Recirculation Riser Differential Pressure – High function (follow-on-action).
7	3.0	Replace GL 91-18 with the correct current reference, i.e., Regulatory Issue Summary (RIS) 2005-020.

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

Revision Number	Affected Section/ Specification	Description of Revision
8	None	N/A
9	3.8.1	Remove Condition C to reflect separation of 1ARS and Bus 1.
10	3.6.1.3	Change TSR 3.6.1.3.2 surveillance test frequency from 7 days to in accordance with the Inservice Testing Program.
11	3.4.3	Deleted Specification 3.4.3 – Snubbers. Addressed under ASME OM Code.
12	None	N/A
13	TOC, 3.3.2.1, 3.6.1.3, 3.6.3.2	Amendment 176 – Changes for EPU. Added Specification 3.6.3.2, “Online Containment Leakage Check,” with fully detailed TRM Bases.
14	None	N/A
15	TOC, 3.3.2.1, 3.4.4	MELLLA+ (also added new specification restricting operation with SRVs out-of-service).
16	3.3.2.1	Increase Channel Calibration interval of SDV level switches for high level rod block trip from 92 days to 12 months.
	3.8.1	Remove incorrect statement in TLCO that 1AR must be powered from 10 transformer when 1AR and 2R are the required offsite circuits.
17	3.3.5.1	Revised Applicability to clarify that the Loss of Auxiliary Power instrumentation is required when the associate ECCS injection/spray subsystem is required Operable per TS LCO 3.5.2.

1.0 USE AND APPLICATION

1.1 Definitions

---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.

Term	Definition
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).

1.0 USE AND APPLICATION

1.2 Logical Connectors

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

1.0 USE AND APPLICATION

1.3 Completion Times

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

1.0 USE AND APPLICATION

1.4 Frequency

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

3.0 TECHNICAL LIMITING CONDITION FOR OPERATION (TLCO) APPLICABILITY

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 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.

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.

TLCO 3.0.3 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:

a. Implement appropriate compensatory actions as needed;

b. Verify that the plant is not in an unanalyzed condition; and

c. Verify that a required safety function is not compromised by the inoperabilities.

In addition, within 12 hours, obtain the Operation Manager’s approval of the compensatory actions and plan for exiting TLCO 3.0.3.

Exceptions to this TLCO are stated in the individual TLCOs.

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.

Actions a, b, and c shall be performed consistent with the Requirements of Regulatory Issue Summary 2005-020.

TLCO 3.0.4 When a TLCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made:

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;

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

TLCO Applicability

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.

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.

TECHNICAL SURVEILLANCE REQUIREMENT (TSR) APPLICABILITY

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.
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.
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)

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.

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. OR A.2 Place associated trip system in trip.	12 hours 12 hours
B. One or more channels inoperable in both trip systems.	B.1 Place channel in one trip system in trip. OR B.2 Place one trip system in trip.	6 hours 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.

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
A. ------------NOTE------------- Only applicable to Functions 1, 2, 3 and 5. --------------------------------- One or more Functions with one required channel inoperable.	A.1 Restore channel to OPERABLE status.	7 days
B. ------------NOTE------------- Only applicable to Functions 1, 2, 3, and 5. --------------------------------- One or more Functions with two required channels inoperable.	B.1 Place channel in the tripped condition. OR B.2 Suspend control rod withdrawal.	Immediately Immediately
C. One or more required Function 4 channels inoperable.	C.1 Place channel in the tripped condition. <u>OR</u> C.2 Suspend control rod withdrawal.	Immediately Immediately

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	-------------------------------NOTE------------------------------- 1. For Function 1.b, not required to be performed if SRM detectors are secured in the full-in position. 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. -- 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.	12 months
TSR 3.3.2.1.5	-------------------------------NOTE------------------------------- 1. Neutron detectors are excluded. 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. -- Perform CHANNEL CALIBRATION.	24 months
TSR 3.3.2.1.6	Perform CHANNEL CALIBRATION.	24 months
TSR 3.3.2.1.7	Perform CHANNEL FUNCTIONAL TEST.	184 days

Table 3.3.2.1-1 (Page 1 of 2)
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[(a)], 5	1	TSR 3.3.2.1.1 TSR 3.3.2.1.2 TSR 3.3.2.1.5	≤ 1.16 x 10^5cps
b. Detector Not Fully Inserted	2[(b)], 5[(b)]	1	TSR 3.3.2.1.2 TSR 3.3.2.1.5	NA
2. Intermediate Range Monitors				
a. Downscale	2[(c)], 5[(c)]	2[(d)]	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[(d)]	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. Simulated Thermal Power – High	1	3[(f)]	TSR 3.3.2.1.6 TSR 3.3.2.1.7	≤ 0.61W + 61.2% RTP[(e)] and < 110% RTP
b. Downscale	1	3[(f)]	TSR 3.3.2.1.6 TSR 3.3.2.1.7	≥ 2/125 divisions of full scale
c. Neutron Flux – High (Setdown)	2	3[(f)]	TSR 3.3.2.1.6 TSR 3.3.2.1.7	≤ 15%
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) ≤ 0.55(W - Delta W) + 55.5% when Technical Specification 3.3.1.1 Function 2.b, is reset for single loop operation per LCO 3.4.1, “Recirculation Loops Operating.” The value of Delta W is defined in the COLR. Single loop operation is not permitted while operating in the MELLLA+ operating domain.

(f) Each APRM channel provides input to both trip systems.

Table 3.3.2.1-1 (Page 2 of 2)
Control Rod Block Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. Average Power Range Monitors (Automated Backup Stability Protection (BSP))				
a. Slope	1[(g)]	3[(f)]	TSR 3.3.2.1.6 TSR 3.3.2.1.7	≤ 1.3
b. Constant Power Line	1[(g)]	3[(f)]	TSR 3.3.2.1.6 TSR 3.3.2.1.7	≤ 30% RTP
c. Constant Flow Line	1[(g)]	3[(f)]	TSR 3.3.2.1.6 TSR 3.3.2.1.7	≥ 58.8% Rated Drive Flow (RDF)
d. Flow Breakpoint	1[(g)]	3[(f)]	TSR 3.3.2.1.6 TSR 3.3.2.1.7	≥ 34.5% RDF

(f) Each APRM channel provides input to both trip systems.

(g) Required only when the Automated BSP Scram Region is implemented in accordance with Technical Specification 3.3.1.1.

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 [(a)]	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. <u>OR</u> A.2 ---------------NOTE-------------- Not applicable if inoperable channel is the result of an inoperable solenoid valve. ------------------------------------- Place channel in trip.	14 days 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: a. Reactor Vessel Water Level - Low Low $\geq$ - 48 inches; and b. Reactor Vessel Steam Dome Pressure - High $\leq$ 1155 psig.	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
When associated ECCS injection/spray subsystem(s) are required to be OPERABLE per LCO 3.5.2, “ECCS – Shutdown”.

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

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

Parameter	Steaming Rate < 100,000 lbs/hr [(a)]	Steaming Rate ≥ 100,000 lbs/hr [(a)]
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)

3.4.4 Safety/Relief Valves (S/RVs) Out-of-Service

TLCO 3.4.4 The safety function of eight S/RVs shall be OPERABLE.

APPLICABILITY: MODE 1, when operating in the MELLLA+ operating domain.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more S/RVs inoperable.	A.1 Restore eight S/RVs to OPERABLE status.	14 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Exit the Maximum Extended Load Line Limit Analysis Plus (MELLLA+) Operating Domain.	12 hours
C. Required Action and associated Completion Time of Condition B not met.	C.1 Enter TLCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

There are no additional surveillance requirements beyond those specified in Technical Specification 3.4.3.

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

---NOTES---

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 other required channel is OPERABLE.

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 < 1330 MWth. --- 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.	In accordance with the Inservice Testing Program

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

3.6 CONTAINMENT SYSTEMS

3.6.3.2 Online Containment Leakage Check

TLCO 3.6.3.2 TSR 3.6.3.2.1 shall be met.

APPLICABILITY: MODE 1

ACTIONS

---NOTE---
This surveillance is performed once at the beginning of a cycle following refueling when containment and reactor conditions are stable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TSR 3.6.3.2.1 not met for allowable leakage criteria.	A.1 Enter TS 3.5.1 (ECCS – Operating) action statement for two or more ECCS injection/spray subsystems inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
TSR 3.6.3.2.1	Determine primary containment leakage rate. The allowable leakage is 150 scfm when tested at ≥ 44.1 psig.	Once per cycle following refueling

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."

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. <u>AND</u> A.2 Restore required NSP transmission line and associated switchgear to OPERABLE status.	Immediately 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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
TSR 3.8.1.1	The following Substation Switchyard Battery 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 3.8.1.2	The following Substation Switchyard Battery 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

3.8 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 ≥ 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

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.

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[b], and 3
Number of Senior Operators	1[a]	2[c]
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[(a)] (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.

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

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

Valve	Location	Isolation Time (if applicable)
B. Manual SCIVs		
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

I - Nominal Trip Setpoints

ITS Table and Function Number	Nominal Trip Setpoint (NTSP)	Am.
Table 3.3.1.1-1 – Reactor Protection System Instrumentation		
Function 2.c: APRM Neutron Flux – High	≤ 119.5 % RTP	159
Table 3.3.1.2-1 – Control Rod Block Instrumentation		
Functions 1.a, 1.b and 1.c:		
Rod Block Monitor – Low Power Range – Upscale (1.a)	As specified in COLR	159
Rod Block Monitor – Intermediate Power Range – Upscale (1.b)	As specified in COLR	159
Rod Block Monitor – High Power Range – Upscale (1.c)	As specified in COLR	159
Table 3.3.5.1-1 – Emergency Core Cooling System Instrumentation		
Functions 1.c, 2.c: Reactor Steam Dome Pressure – Low (Injection Permissive)	420 psig	146
Functions 1.d, 2.d: Reactor Steam Dome Pressure Permissive – Low (Pump Permissive)	420 psig	146

APPENDIX C

I - Nominal Trip Setpoints

ITS Table and Function Number	Nominal Trip Setpoint (NTSP)	Am.
Table 3.3.5.1-1 – Emergency Core Cooling System Instrumentation (con't)		
Function 2.j:		
Recirculation Riser Differential Pressure – High (Break Detection)	56.0 inches (water-column)	161
Functions 4.c, 5.c:		
Core Spray Pump Discharge Pressure – High	100 psig	146
Functions 4.d, 5.d:		
Low Pressure Coolant Injection Pump Discharge Pressure – High	100 psig	146

APPENDIX C

II - Nominal Trip Setpoint Methodology (for identified SL-LSSS digital functions)

II.A. ITS Table 3.3.1.1-1, Function 2.c [Am. 159]

- APRM Neutron Flux – High (2.c)

The Nominal Trip Setpoint (NTSP) for this Function was established in accordance with the guidance provided in ESM-03.02-APP-I. Calculation CA-08-050, Revision 0 (Ref. 4) discusses determination of the NTSP, using GE-Hitachi methods analogous to those below.

$NTSP_1$ = AL ± (1.645/2) (SRSS of random terms) ± bias terms for process variables which decrease (+) or increase (-) to trip

$NTSP_2$ = AV ± (desired margin) (Sigma (LER))

The more conservative of $NTSP_1$ or $NTSP_2$ is the governing value.

The PRNM System is a digital system. PRNM System setpoints are stored as numerical values within the PRNMS digital system database and are not subject to drift. The stored setpoint is the NTSP. There is no As Left tolerance (ALT) / As Found tolerance (AFT) associated with re-setting a digital instrument setpoint during surveillance.

II.B. ITS Table 3.3.1.2-1, Functions 1.a, 1.b and 1.c [Am. 159]

- Rod Block Monitor – Low Power Range – Upscale (1.a)
- Rod Block Monitor – Intermediate Power Range – Upscale (1.b)
- Rod Block Monitor – High Power Range – Upscale (1.c)

The NTSPs for these Functions were established in accordance with the guidance provided in ESM-03.02-APP-I. Calculation CA-08-051, Revision 0 (Ref. 5) discusses determination of the NTSP, using GE-Hitachi methods analogous to those below.

$NTSP_1$ = AL ± (1.645/2) (SRSS of random terms) ± bias terms for process variables which decrease (+) or increase (-) to trip

$NTSP_2$ = AV ± (desired margin) (Sigma (LER))

The more conservative of $NTSP_1$ or $NTSP_2$ is the governing value.

The PRNM System is a digital system. PRNM System setpoints are stored as numerical values within the PRNMS digital system database and are not subject to drift. These stored setpoints are the NTSP. There is no ALT/AFT associated with re-setting digital instrument setpoints during surveillances.

APPENDIX C

III - As-Left Methodology

III.a. ITS Table 3.3.5.1-1, Functions 1.c, 1.d, 2.c, 2.d, 4.d, and 5.d [Am. 146]

- Reactor Steam Dome Pressure – Low (Injection Permissive) (1.c and 2.c)
- Reactor Steam Dome Pressure Permissive – Low (Pump Permissive) (1.d and 2.d)
- Low Pressure Coolant Injection Pump Discharge Pressure – High (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 X 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 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.

III.b. ITS Table 3.3.5.1-1, Function 2.j [Am. 161]

- Recirculation Riser Differential Pressure – High (Break Detection)

The ALT for this Function was established in accordance with the guidance provided in ESM-03.02-APP-I: The following equation was applied to determine the ALT in accordance with CA-04-098, Revision 2 (Ref. 6).

$$ALT = (VA^2 + C_1^2 + C_{1STD}^2)^{1/2}$$

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 this Function, the existing plant ALT was determined to be too restrictive and was increased in order to provide greater ease in the calibration process. The established ALT is within the ALT that would be determined with the above guidance.

III.c ITS Table 3.3.5.1-1 Functions 4.c, 5.c [Am. 146]

- Core Spray Pump Discharge Pressure – High (4.c and 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 X VA."

APPENDIX C

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

IV - As-Found Methodology

IV.a. ITS Table 3.3.5.1-1, Functions 1.c, 1.d, 2.c, and 2.d [Am. 146]

- Reactor Steam Dome Pressure – Low (Injection Permissive) (1.c and 2.c)
- Reactor Steam Dome Pressure Permissive – Low (Pump Permissive) (1.d and 2.d)

The 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:

$AFT_1 = (3/2)\ (VA^2 + VD^2 + DTE^2)^{1/2}$; 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_1 equation.

IV.b. ITS Table 3.3.5.1-1, Function 2.j [Am. 161]

- Recirculation Riser Differential Pressure – High (Break Detection)

The AFTs for this Function was 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." Several suggested ways of determining the AFT are provided in ESM-03.02-APP-I. The following equation was applied to determine the AFT in accordance with CA-04-098, Revision 2 (Ref. 6).

$AFT = (ALT^2 + AD^2)^{1/2} + D_{Bias}$.

"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.

APPENDIX C

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.

IV.c <u>ITS Table 3.3.5.1-1, Functions 4.c, 4.d, 5.c, and 5.d</u> [Am. 146]

- Core Spray Pump Discharge Pressure – High (4.c and 5.c)
- Low Pressure Coolant Injection Pump Discharge Pressure – High (4.d 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:

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

APPENDIX C

REFERENCES

1. Amendment No. 146, "Monticello Nuclear Generating Plant (MNGP) - Issuance of Amendment for the Conversion to the Improved Technical Specifications with Beyond-Scope Issues (TAC Nos. MC7505, MC7597 through MC7611, and MC8887)," dated June 5, 2006. (ADAMS Accession No. ML061240241)

2. Amendment No. 159, "Issuance of Amendment Re: Request to Install Power Range Neutron Monitoring System," dated February 3, 2009. (ADAMS Accession No. ML083440681)

3. Amendment No. 161, "Monticello Nuclear Generating Plant - Issuance of Amendment Regarding Recirculation Riser Differential Pressure (TAC No. MD6864)," dated April 7, 2009. (ADAMS Accession No. ML083040608)

4. CA-08-050, Revision 0, "Average Power Range Monitor (APRM) Non-Flow Biased PRNMS Setpoints for CLTP and EPU," Attachment 4, DRF No. 0000-0076-2387, "Nuclear Management Company, LLC, Monticello Nuclear Generating Plant PRNM Licensing Setpoints - CLTP Operation," December 2007.

5. CA-08-051, Revision 0, "Rod Block Monitor (RBM) PRNM Setpoints for CLTP and EPU Operation," Attachment 4, DRF No. 0000-0076-2387, "Nuclear Management Company, LLC, Monticello Nuclear Generating Plant PRNM Licensing Setpoints - CLTP Operation," December 2007.

6. CA-04-098, Revision 2, "Instrument Setpoint Calculation, Recirculation Riser Differential Pressure – High (LPCI Loop Select)."

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

Section/Specification	Revision No.
Table of Contents	15
B 3.0	0
B 3.3.1.1	0
B 3.3.2.1	16
B 3.3.3.1	0
B 3.3.4.1	0
B 3.3.5.1	17
B3.3.7.1	12
B 3.4.1	0
B 3.4.2	0
B 3.4.3	(Deleted)
B 3.4.4	15
B 3.5.1	0
B 3.5.2	8
B 3.6.1.3	13
B 3.6.1.7	0
B 3.6.3.2	13
B 3.8.1	0
B 3.8.2	0
B 3.9.1	0

TRM BASES RECORD OF REVISIONS

Revision Number	Affected Bases Section/ Specification	Description of Revision
0	All	Original TRM Bases Issuance
1	B 3.3.7.1	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	None	N/A
3	3.4.3	Complete rewrite of existing TRM Bases to TS Bases standards. Revised TRM Bases to incorporate ASME OM Code – 1995, 1996 Addenda and Code Case OMN-13 for visual inspection of snubbers.
4	None	N/A
5	3.3.2.1	Amendment 159 – incorporated PRNMS. Revised APRM functions in Table 3.3.2.1-1 to include APRM STP – High and Neutron Flux – High (Setdown) rod blocks. Added new SR 3.3.2.1.6 and SR 3.3.2.1.7. Complete rewrite of existing TRM Specification 3.3.2.1 bases to TS Bases standards.
6	3.5.2	Revised Specification to add a Note providing a 6-hour delay to entry into the Required Action solely for surveillance performance. Added complete TRM Bases for Specification 3.5.2 to TS Bases standards.
7	None	N/A
8	3.5.2	Each Core Spray sparger break detection instrumentation is associated with a single sparger. Removed incorrect statement in TRM Bases for Specification 3.5.2 implying that monitoring capability is maintained when the instrumentation for that sparger is inoperable.
9	None	N/A
10	3.6.1.3	Added TRM Bases discussion about changing TSR 3.6.1.3.2 surveillance test frequency from 7 days to in accordance with the Inservice Testing Program.

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

Revision Number	Affected Bases Section/ Specification	Description of Revision
11	3.4.3	Deleted Specification 3.4.3 – Snubbers. Addressed under ASME OM Code.
12	3.3.7.1	Correct page numbers on TRM Bases pages.
13	TOC, 3.6.1.3, 3.6.3.2	Amendment 176 – Changes for EPU. Added Specification 3.6.3.2, “Online Containment Leakage Check,” with fully detailed TRM Bases.
14	3.3.5.1	Added complete Loss of Auxiliary Power Instrumentation TRM Bases in TS Bases format.
15	TOC, 3.3.2.1, 3.4.4	MELLLA+ (also added bases for specification which discusses limitation on an SRV being out of service in the MELLLA+ domain.
16	3.3.2.1	Correct the number of SDV water level rod block instrument channels and instruments.
17	3.3.5.1	Revised Applicability to clarify that the Loss of Auxiliary Power instrumentation is required when the associate ECCS injection/spray subsystem is required Operable per TS LCO 3.5.2.

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

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:

a. Completion of the Required Actions within the specified Completion Times constitute compliance with a Requirement; and

b. Completion of the Required Actions is not required when a TLCO is met within the specified Completion Time, unless otherwise specified.

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

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.

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

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.

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

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

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.

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.

B 3.0 TECHNICAL SURVEILLANCE REQUIREMENT (TSR) APPLICABILITY

BASES

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.

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.

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

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.

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

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

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.

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

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."

3.3 INSTRUMENTATION

B 3.3.1.1 Turbine Condenser Vacuum - Low Instrumentation

BASES

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

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.

B 3.3 INSTRUMENTATION

B 3.3.2.1 Control Rod Block Instrumentation

BASES

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 four APRM's, eight IRM's, four SRM's, or two scram discharge volume water level channels will result in a rod block. For each Control Rod Block Function, there are two trip systems, with the exception of the scram discharge volume water level trip function, which only feeds one trip system. The scram discharge volume water level instrumentation includes one sensor 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 Simulated Thermal Power – High rod block (Refs. 3 and 4) is referenced to flow and prevents operation significantly above the licensing basis power level especially during operation at reduced flow. For operation at low power (i.e., MODE 2), the APRM Neutron Flux – High (Setdown) Function (Ref. 3) is capable of generating a rod block to prevent fuel damage resulting from abnormal operating transients in this power range. The APRMs 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 APRM Backup Stability Protection (BSP) Flow-Bias rod blocks are active when the Automated Backup Stability Protection (ABSP) function is enabled. The BSP Flow-Bias rod blocks provide a rod block for reactivity transients when operating at low recirculation flows with the OPRMs out of service. These rod blocks provide a warning of potential ABSP scrams. The constant flow line and flow breakpoint are in terms of rated (recirculation) drive flow or RDF (see Ref. 5). Addition of these rod block functions was approved by Amendment No. 180 (Ref. 6).

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 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 IRM rod block assures 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 IRM rod block is set at 3/125 of full scale.

BASES

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.

Trip Function	Deviation
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. The 184 day CHANNEL FUNCTIONAL TEST and 24 month CHANNEL CALIBRATION surveillance frequencies for the APRM Simulated Thermal Power – High, APRM Downscale, and APRM Neutron Flux – High (Setdown) rod block functions are consistent with the NUMAC PRNMS design assumptions (Refs. 1 and 2). 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.

REFERENCES

1. NEDC-32410P-A, “Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC PRNM) Retrofit Plus Option III Stability Trip Function,” October 1995.

2. NEDC-32410P-A, Supplement 1, “Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC PRNM) Retrofit Plus Option III Stability Trip Function,” November 1997.

3. Amendment No. 159, “Issuance of Amendment Re: Request to Install Power Range Neutron Monitoring System,” dated February 3, 2009. (ADAMS Accession No. ML083440681)

4. Calculation 08-052, “Instrument Setpoint Calculation – Average Power Range Monitor (APRM) Flow Biased PRNM Setpoints for EPU,” Revision 2.

5. Calculation 12-043 “Average Power Range Monitor NUMAC PRNM Setpoints – MELLLA+ Automatic Backup Stability Protection (ABSP),” Revision 0.

6. Amendment No. 180, “Monticello Nuclear Generating Plant – Issuance of Amendment No. 180 to Renewed Facility Operating License Regarding MELLLA+,” dated March 28, 2014. (ADAMS Accession No. ML14035A248)

B 3.3 INSTRUMENTATION

B 3.3.3.1 Post Accident Monitoring (PAM) Instrumentation

BASES

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.

B 3.3 INSTRUMENTATION

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

BASES

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.

B 3.3 INSTRUMENTATION

B 3.3.5.1 Loss of Auxiliary Power (LOP) Instrumentation

BASES

BACKGROUND

Successful operation of the required safety functions of the Emergency Core Cooling Systems (ECCS) is dependent upon the availability of adequate power sources for energizing the pump motors. The LOP instrumentation monitors the 4.16 kV essential buses and source breakers. The Loss of Auxiliary Power “Pump Bus Power Monitor” instrumentation determines if there is sufficient power available to allow the starting of the ECCS pump motors in sequence.

Each 4.16 kV essential bus has its own independent LOP Pump Bus Power Monitor instrumentation and associated trip logic. The 4.16 kV power availability for each bus is monitored by two different methods, which can be considered as two different LOP Pump Bus Power Monitor power availability monitoring Channels: 4.16kV Essential Bus Loss of Voltage channel and 4.16 kV Essential Bus source breaker position channel.

The 4.16 kV Essential Bus Loss of Voltage Channel is monitored by two (2) undervoltage relays for each emergency bus, whose outputs are arranged in a one-out-of-two logic configuration (i.e., either undervoltage relay must sense 4kV power is available to provide a permissive to allow the Core Spray and RHR pumps to start in sequence). The undervoltage relays are shown in the Core Spray System Schematic Diagrams.

The 4.16 kV Essential Bus source breaker position Channel is monitored by breaker contacts on the three (3) Essential Bus Power Source breakers for each essential bus (from the EDG, 1AR or the Non-Essential Bus respectively) (i.e., one source breaker must indicate the source breaker is closed and therefore 4kV power is available at the essential bus to provide a permissive to allow the Core Spray and RHR pumps to start in sequence). The 4.16kV Essential Bus source breaker contacts for the three (3) Essential Bus Power Source breakers are shown in the RHR System Schematic Diagrams.

Either Bus Power Monitoring Channel will provide the permissive signal to allow both the Core Spray and RHR pumps to start in sequence.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The LOP instrumentation is required to ensure the availability of adequate power sources for energizing the ECCS pump motors. The LOP instrumentation monitors the 4.16 kV essential buses and source breakers. The Loss of Auxiliary Power Pump Bus Power Monitor instrumentation determines if there is sufficient power available to allow the starting of the ECCS pump motors in sequence.

ACTIONS

A Note has been provided to modify the ACTIONS related to LOP instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable LOP instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable LOP instrumentation channel.

A.1

With one channel of a Function inoperable in one required trip system, the channel is not capable of performing the intended function for that trip system. Therefore, only 12 hours is allowed to restore the inoperable channel to OPERABLE status.

If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, Condition B must be entered and its Required Action taken.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 12 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration of channels.

BASES

ACTIONS (continued)

B.1

If any Required Action and associated Completion Time are not met, or if two Loss of Auxiliary Power instrument channels are inoperable in one or both required trip systems, the associated Function is not capable of performing the intended function. Therefore, the associated low pressure ECCS Pumps are declared inoperable immediately. This requires entry into applicable Conditions and Required Actions of LCO 3.5.1 and LCO 3.5.2, which provide appropriate actions for inoperable Core Spray and RHR Pumps.

SURVEILLANCE REQUIREMENTS

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 6 hours provided the channel in the same trip system is monitoring that parameter. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken.

TSR 3.3.5.1.1

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. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of TSR 3.3.5.1.1 is based upon the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

BASES

REFERENCES

1. USAR, Section 8.4.1.3.
2. USAR, Section 6.2.
3. USAR, Section 14.7.2.
4. AR 01429107

B 3.3 INSTRUMENTATION

B 3.3.7.1 Control Room Air Intake Radiation - High Instrumentation

BASES

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)

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.

3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.1 RCS Chemistry

BASES

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 μmho/cm during reactor startup and 5 μmho/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., Na_2SO_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 μmho/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 μmho (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.

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.

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.4 Safety/Relief Valves (S/RVs) Out-of-Service

BASES

BACKGROUND

The ASME Boiler and Pressure Vessel Code requires the reactor pressure vessel be protected from overpressure during upset conditions by self-actuated safety valves. As part of the nuclear pressure relief system, the size and number of S/RVs are selected such that peak pressure in the nuclear system will not exceed the ASME Code limits for the reactor coolant pressure boundary (RCPB).

Technical Specification LCO 3.4.3, "Safety/Relief Valves (S/RVs)," provides safety mode requirements for the limiting design basis event of closure of all main steam isolation valves (MSIVs), followed by reactor scram on high neutron flux. This TLCO imposes an additional restriction that all eight S/RVs be OPERABLE to meet reactor vessel overpressure protection limits for operation within the Maximum Extended Load Line Limit Analysis Plus (MELLLA+) operating domain for an Anticipated Transient Without Scram (ATWS) event. Reactor vessel pressure is required to remain within ASME Code Service Level C limits of 1500 psig for the postulated ATWS event in the MELLLA+ operating domain.

APPLICABLE SAFETY ANALYSES

The overpressure protection system must accommodate the most severe pressurization transient. Evaluations have determined that the most severe design basis event is the closure of all main steam isolation valves (MSIVs), followed by reactor scram on high neutron flux (i.e., failure of the direct scram associated with MSIV position) (Ref. 1). For the purpose of the analyses, five S/RVs are assumed to operate in the safety mode. The analysis results demonstrate that the design S/RV capacity is capable of maintaining reactor pressure below the ASME Code limit of 110% of vessel design pressure as described in Technical Specification 3.4.3. However, two additional S/RVs are required to be OPERABLE to provide additional relief capability per Technical Specification 3.4.3.

For the purpose of the ATWS analyses occurring within the MELLLA+ operating domain, eight S/RVs are assumed to operate in the safety mode (Ref. 2). Consequently, the S/RV Out of Service (SRVOOS) flexibility option is not permitted during operation in the MELLLA+ operating domain. Analysis results demonstrate that the design S/RV capacity is capable of maintaining reactor pressure below the ASME Service Level C Code limit of 1500 psig. This TLCO helps to ensure that this acceptance limit of 1500 psig is met if an ATWS were to occur while operating in the MELLLA+ operating domain.

BASES

TLCO

The safety mode of eight S/RVs are required to be OPERABLE to satisfy the assumptions of the MELLLA+ safety analysis (Ref. 2). The requirements of this TLCO are applicable only to the capability of the S/RVs to mechanically open to relieve excess pressure when the lift setpoint is exceeded (valve safety function).

The S/RV setpoints are established to ensure that the ASME Code Service Level C limit on peak reactor pressure is satisfied. Operation with fewer than eight valves OPERABLE, or with setpoints outside the ASME limits, could result in a more severe reactor response to an ATWS than predicted, possibly resulting in the ASME Code Service Level C limit on reactor pressure being exceeded for an ATWS event that originates within the MELLLA+ operating domain.

APPLICABILITY

In MODE 1 all eight S/RVs must be OPERABLE in the MELLLA+ operating domain, since considerable energy may be in the reactor core and the limiting ATWS event is assumed to occur in this MODE. The lower end of the MELLLA+ operating domain is approximately 70.2% of Rated Thermal Power (RTP), which is not achievable in the other operating modes. The S/RVs may be required to provide pressure relief to discharge energy from the core until such time that the Residual Heat Removal (RHR) System is capable of dissipating the core heat.

ACTIONS

A.1

The TLCO requires eight S/RVs to be OPERABLE to provide overpressure protection for a postulated ATWS event in the MELLLA+ operating domain. With less than the number of S/RVs specified OPERABLE, an overpressure event could result in violation of the ASME Code Service Level C limit on reactor pressure based on the licensing basis overpressure analysis ATWS in the MELLLA+ operating domain. The Required Action and associated Completion Time are consistent with Section 9.3.1.1 and Appendix B, Condition 12.18.d, of Reference 2. For this reason, continued operation with an S/RV inoperable is permitted for a limited time.

The 14 day Completion Time to restore inoperable S/RVs to OPERABLE status is based on the low probability of an event requiring S/RV actuation, and a reasonable time to complete the Required Action. This Required Action aligns with the the Required Action and associated Completion Time for Technical Specification 3.4.3 when an S/RV is inoperable.

BASES

ACTIONS (continued)

B.1

If the safety function of the inoperable S/RVs cannot be restored to OPERABLE status within the associated Completion Time of Required Action A.1, the plant must be brought to a condition in which the TLCO does not apply. To achieve this status, the MELLLA+ operating domain must be exited within 12 hours. The allowed Completion Time is reasonable, based on similar plant operating experience, to exit the MELLLA+ operating domain from full power conditions in an orderly manner and without challenging plant systems.

C.1

If the MELLLA+ operating domain cannot be exited within 12 hours, the assumption on the number of S/RVs credited in the safety analyses to provide to an overpressure protection for an ATWS event in the MELLLA+ operating domain is not met and the unit is in a condition outside the accident analyses. Therefore, TLCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

There are no surveillance requirements associated with this TLCO.

REFERENCES

1. USAR, Section 14.5.1.
2. NEDC-33453P, Revision 1, Maximum Extended Load Limit Analysis Plus (MELLLA+) Safety Analysis Report.
3. Amendment No. 180, “Monticello Nuclear Generating Plant – Issuance of Amendment No. 180 to Renewed Facility Operating License Regarding MELLLA+,” March 28, 2014. (ADAMS Accession No. ML14035A248).

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

No Bases information is provided.

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

BACKGROUND

Two independent Core Spray subsystems are provided. Each subsystem consists of a 100 percent-capacity centrifugal pump driven by an electric motor, a spray sparger in the reactor vessel above the core, piping and valves to convey water from the suppression pool to the sparger, and the associated controls and instrumentation.

The two 100-percent capacity core spray lines separately enter the reactor vessel through two core spray nozzles that are 180 degrees apart. Each internal pipe then divides into a semicircular header with a downcomer at each end, which enters through the shroud near the top. A semicircular sparger is attached to each of the four outlets to make two practically complete circles, one above the other. Short elbow nozzles are spaced around the spargers to spray the water radially onto the tops of the fuel assemblies.

A detection system is also provided to continuously confirm the integrity of the core spray piping between the inside of the reactor vessel and the core shroud. A differential pressure switch measures the pressure difference between the bottom of the core and the inside of the core spray sparger pipe just outside the reactor vessel. If the core spray sparger piping is sound, this pressure difference will be the pressure drop across the core. If integrity is lost, this pressure drop will include the core pressure drop and the steam separator pressure drop. An increase in the normal pressure drop (decrease in indicated differential pressure to the setpoint) initiates an alarm in the control room.

It should be noted that the instrument is in alarm during cold moderator conditions due to the instrument leg variations in densities. The alarm should clear during the increase to rated temperature and pressure. During operation at rated temperature and pressure, the alarm should remain clear.

APPLICABLE SAFETY ANALYSIS

The safety function of the Core Spray System is to maintain the fuel cladding temperature to $\leq$ 2200°F during times the other ECCS systems may be incapable of maintaining vessel water inventory above the top of active fuel (TAF). The method of cooling requires that the water spray directly on top of the fuel assemblies rather than trying to maintain water above TAF. If the Core Spray sparger is broken, this will not be accomplished and the subsystem will not meet its safety design function.

BASES

APPLICABLE SAFETY ANALYSIS (continued)	The Core Spray sparger break detection instrumentation provides continuous monitoring of the integrity of the sparger.
TLCO 3.5.2	The Core Spray sparger break detection alarm, within the allowable value at rated temperature and pressure, provides indication of a potential break in the associated subsystem's sparger. A broken sparger will cause the subsystem to be inoperable.
APPLICABILITY	The OPERABILITY requirement is consistent with Technical Specification requirements for the times when the affected subsystem is required to be OPERABLE and the instrument is indicating meaningful readings.
ACTIONS	<u>A.1</u> When one or both Core Spray System nozzle differential pressure channels are inoperable, it is required that actions be initiated immediately to restore the channel(s) to OPERABLE status.
TECHNICAL SURVEILLANCE REQUIREMENTS	The Technical Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Technical Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours. Upon completion of the Technical Surveillance, or expiration of the 6 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 reliability analysis (Ref. 2) assumption that 6 hours is the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the capability for monitoring the integrity of the Core Spray spargers will be available when necessary.

BASES

TECHNICAL SURVEILLANCE REQUIREMENTS (continued)

TSR 3.5.2.1

Performance of the CHANNEL CHECK once every 24 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the TLCO.

TSR 3.5.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specification tests at least once per refueling interval with applicable extensions.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The Frequency of 31 days is based on engineering judgment and the reliability of these components.

BASES

TECHNICAL SURVEILLANCE REQUIREMENTS (continued)

TSR 3.5.2.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that 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 the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. MNGP Technical Specifications (version prior to standardized version)

2. GENE-770-06-1-A, "Bases for Changes to Surveillance Test Intervals and Allowed Out-Of-Service Times for Selected Instrumentation Technical Specifications," December 1992.

3.6 CONTAINMENT SYSTEMS

B 3.6.1.3 Primary Containment Isolation Valves (PCIVs)

BASES

TSR 3.6.1.3.1

It is required to test each normally open power operated PCIV, the Main Steam Isolation Valves (MSIVs) in this case, in accordance with the Inservice Test Program. This testing is performed for one MSIV at a time and at a THERMAL POWER level of less than 75% of Rated Thermal Power (RTP). The licensed RTP at the time this surveillance was transferred to the TRM from the TS was 1775 MW_{th} (which correlated to approximately 1330 MW_{th}). Data taken during MSIV testing in April 2005 (Procedure 8025) indicated that sufficient margin existed to the acceptance criteria for high steam flow differential pressure, reactor pressure, reactor power and reactor water level when an MSIV was “fast stroked” closed at power levels of up to 74% of the then current RTP (1775 MW_{th}). Stroking an MSIV closed at too high a power level can result in a plant trip. Stroke testing at 1330 MW_{th} allows testing to be performed at a power level that will preclude a plant trip.

TSR 3.6.1.3.2

The partial stroke test of each Main Steam Isolation Valve (MSIV) is conducted to demonstrate that the valve is functional and will not malfunction due to valve or actuator problems. The exercise is performed by depressing and holding the MSIV test pushbutton until position indication changes or Reactor Protection System (RPS) limit switches de-energize. The exercise does not operate any MSIV solenoid or air control valve that would operate during an auto close of the MSIV or during a manual fast close of the MSIV performed using the MSIV hand switch. The IST Program requires each MSIV to be partially stroked on a quarterly basis. Continuance of the MSIV testing requirements of TSR 3.6.1.3.2 on a quarterly basis will satisfy ASME Operation and Maintenance (OM) Code partial stroke exercise testing requirements.

3.6 CONTAINMENT SYSTEMS

B 3.6.1.7 Suppression Chamber-to-Drywell Vacuum Breakers

BASES

No Bases information is provided.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.3.2 Online Containment Leakage Check

BASES

BACKGROUND

The function of the primary containment is to isolate and contain fission products released from the Reactor Primary System following a design basis loss of coolant accident (LOCA) and to confine the postulated release of radioactive material as described in Technical Specification 3.6.1.1. For plants crediting containment accident pressure (CAP) to maintain net positive suction head (NPSH) margin for emergency core cooling system (ECCS) pump performance, maintenance of containment integrity is required to meet the assumptions of the safety analyses.

The purpose of this TRM specification is to ensure that an undetected containment leakage rate in excess of that required to maintain CAP does not develop between integrated containment leakage tests. Monticello takes credit for CAP to provide adequate NPSH to the Core Spray and Residual Heat Removal (RHR) pumps during certain postulated accident events.

NRC SECY 11-0014 (Ref. 1), Section 6.6.7, “Assurance of no Pre-existing Leak”, requires consideration of a loss of containment isolation that could compromise containment integrity, e.g., containment venting required by procedures or loss of containment isolation from a postulated 10 CFR 50 Appendix R fire. To apply the SECY’s guidance it is required to determine the minimum containment leakage rate sufficient to lose the CAP needed for adequate NPSH margin. Second, a method to determine whether the actual containment leakage rate exceeds this leakage rate is required. For inerted containments, this method could consist of a periodic quantitative measurement of the nitrogen makeup performed at an appropriate frequency to ensure that no unusually large makeup of nitrogen occurs.

This TRM specification specifies performance of an online (MODE 1) containment leakage test to determine the containment leakage rate during power operation (Ref. 2 and 3). Addition of this specification is required as part of the changes necessary to implement the Extended Power Uprate (Ref. 4). This leakage rate test is performed once-per-cycle, after an outage at the beginning of a new operating cycle when the plant is stabilized at full power. This online containment leakage rate test is a benchmark quantitative test which provides a baseline that would identify any significant change in the containment leakage rate at any time during power operation.

The containment leakage rate surveillance is performed at normal operating conditions when containment is at a pressure slightly higher than atmospheric pressure. Consequently, the surveillance leakage rate

BASES

BACKGROUND (Continued)

test acceptance criterion has been correlated to a leakage rate associated with normal operating containment pressure which assumes leakage behavior is orifice-like. This reduced test pressure acceptance criterion correlation is consistent with the method currently used to leak test the MSIVs at reduced pressure per Technical Specification SR 3.6.1.3.12.

There are several control room inputs that are used for normal monitoring and that can indicate an increase in the containment leak rate between performance of this TSR:

- A computer point that continually calculates N_2 mass in containment and provides a computer alarm if the N_2 mass is too low or too high.
- A control room annunciator that alarms on drywell high or low pressure.
- A flow indicator that measures N_2 flow in the supply to the containment air system.

APPLICABLE SAFETY ANALYSES

The safety design basis for the primary containment is that it must withstand the pressures and temperatures of the limiting DBA-LOCA without exceeding the design leakage rate. In the analysis of this accident, it is assumed that primary containment is OPERABLE such that release of fission products to the environment is controlled by the rate of primary containment leakage. Analytical methods and assumptions involving the primary containment are presented in References 5 and 6. Sufficient primary containment integrity is also required to maintain ECCS NPSH margin to ensure that the required CAP is available to meet the assumptions used in the safety analyses of References 5 and 6.

A computer analysis using the GOTHIC code was performed to determine the MNGP containment leakage rates sufficient to lose CAP. Conservative input assumptions were applied, with the exception of a temperature dependent K-value for the RHR heat exchanger. Results were determined for various multiples of L_a (the Technical Specification specified leakage rate). 1 L_a is equivalent to a leakage rate of 7.6 scfm at the current licensed thermal power. The results indicate that a containment leakage rate greater than 228 scfm will result in a complete loss of NPSH margin. A leakage rate of $\leq$150 scfm (based on the peak containment accident pressure of 44.1 psig) was chosen as the TRM acceptance criteria to provide margin to the limiting containment leakage rate of 228 scfm.

BASES

APPLICABLE SAFETY ANALYSES (Continued)	Note that the actual leakage rate that could challenge NPSH margin for the ECCS and containment heat removal pumps (RHR) is greater than 228 scfm, which is well above the leakage that can be detected by the testing method.
TLCO	Primary containment OPERABILITY for ECCS pump (and containment heat removal (RHR) pump) performance is maintained by limiting the containment leakage rate to within the acceptance criteria specified in the TSR. Compliance with this TLCO will ensure a primary containment configuration that will limit leakage to the leakage rate assumed with respect to CAP in the safety analyses.
APPLICABILITY	In MODE 1 once-per-cycle, after an outage at the beginning of a new operating cycle when the plant is stabilized at full power. This surveillance also may be performed during a cycle when results of online parameter measurements indicate another measurement is warranted. A Note is provided indicating that this surveillance is performed once at the beginning of a cycle following refueling when containment and reactor conditions are stable.
ACTIONS	<u>A.1</u> In the event primary containment leakage rate surveillance is not met, the assumption of sufficient NPSH to maintain ECCS and containment heat removal (RHR) pump performance as assumed in the safety analyses may not be met. This condition requires immediate entry into the Required Actions of Technical Specification 3.5.1, “ECCS – Operating”, for two or more ECCS injection/spray subsystems inoperable.
SURVEILLANCE REQUIREMENTS	<u>SR 3.6.1.1.1</u> Maintaining the primary containment OPERABLE to provide ECCS pump NPSH margin requires compliance with the allowable containment leakage rate specified.
REFERENCES	1. SECY-11-0014, Enclosure 1, “The Use of Containment Accident Pressure in Reactor Safety Analysis” (ADAMS Accession No. ML102110167)

BASES

REFERENCES (Continued)

2. Letter from NSPM to NRC, "Monticello Extended Power Uprate and Maximum Extended Load Line Limit Analysis Plus License Amendment Requests: Supplement to Address SECY-11-0014, Use Containment Accident Pressure (TAC Nos. MD9990 and ME3145)," (L-MT-12-082) dated September 28, 2012

3. Letter from NSPM to NRC, "Monticello Extended Power Uprate: SECY-11-0014, Use of Containment Accident Pressure – Responses to Requests for Additional Information, (TAC No. MD9990)," (L-MT-13-033) dated March 21, 2013

4. Amendment No. 176, "Monticello Nuclear Generating Plant – Issuance of Amendment No. 176 to Renewed Facility Operating License Regarding Extended Power Uprate," (ADAMS Accession No. ML13316C459)

5. USAR, Section 5.2

6. USAR, Section 14.7.2

3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 Northern States Power (NSP) Transmission Lines

BASES

No Bases information is provided.

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.