UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 29, 2018

Mr. Christopher Church
Site Vice President
Monticello Nuclear Generating Plant
Northern States Power Company - Minnesota (NSPM)
2807 West County Road 75
Monticello, MN 55362-9637

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT - ISSUANCE OF AMENDMENT RE: ADOPTION OF TSTF-542, REACTOR PRESSURE VESSEL WATER INVENTORY CONTROL (EPID: L-2017-LLA-0360)

Dear Mr. Church:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 198 to Renewed Facility Operating License No. DPR-22 for the Monticello Nuclear Generating Plant. The amendment consists of changes to the Technical Specifications in response to your application dated October 20, 2017, as supplemented by letters dated June 1, 2018, and September 11, 2018.

The amendment revises the Monticello Nuclear Generating Plant technical specification to adopt Technical Specification Task Force (TSTF) Travel 542, "Reactor Pressure Vessel Water Inventory Control."

A copy of our related safety evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

Robert F. Kuntz, Senior Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-263

Enclosures:
1. Amendment No. 198 to DPR-22
2. Safety Evaluation

Cc: Listserv

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 198, are hereby incorporated in the license. NSPM shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented prior to the next refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

David J. Wrona, Chief
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Operating
License No. DPR-22 and
Technical Specifications

Date of Issuance: October 29, 2018

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-263

MONTICELLO NUCLEAR GENERATING PLANT

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 198
License No. DPR-22

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Northern States Power Company (NSPM, the licensee), dated October 20 2017, as supplemented by letters dated June 1, 2018, and September 11, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.2 of Renewed Facility Operating License No. DPR-22 is hereby amended to read as follows:

ATTACHMENT TO LICENSE AMENDMENT NO. 198

MONTICELLO NUCLEAR GENERATING PLANT

RENEWED FACILITY OPERATING LICENSE NO. DPR-22

DOCKET NO. 50-263

Replace the following page of Renewed Facility Operating License DPR-22 with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

REMOVE	INSERT
3	3

Replace the following pages of Appendix A, Technical Specifications, with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE	INSERT
1.1-2	1.1-2
1.1-3	1.1-3
1.1-4	1.1-4
1.1-5	1.1-5
1.1-6	1.1-6
------	1.1-7
3.3.5.1-1	3.3.5.1-1
3.3.5.1-2	3.3.5.1-2
3.3.5.1-3	3.3.5.1-3
3.3.5.1-6	3.3.5.1-6
3.3.5.1-7	3.3.5.1-7
3.3.5.1-8	3.3.5.1-8
3.3.5.1-9	3.3.5.1-9
3.3.5.1-10	3.3.5.1-10
3.3.5.1-11	3.3.5.1-11
------	3.3.5.3-1
------	3.3.5.3-2
------	3.3.5.3-3
3.3.6.1-3	3.3.6.1-3
3.3.6.1-7	3.3.6.1-7
3.3.6.2-3	3.3.6.2-3
3.3.7.1-3	3.3.7.1-3
3.3.8.2-1	3.3.8.2-1
3.3.8.2-2	3.3.8.2-2
3.5.1-1	3.5.1-1

REMOVE	INSERT
3.5.2-1	3.5.2-1
3.5.2-2	3.5.2-2
3.5.2-3	3.5.2-3
------	3.5.2-4
3.5.3-1	3.5.3-1
3.6.1.3-1	3.6.1.3-1
3.6.1.3-5	3.6.1.3-5
3.6.1.3-6	3.6.1.3-6
3.6.4.1-1	3.6.4.1-1
3.6.4.2-1	3.6.4.2-1
3.6.4.2-3	3.6.4.2-3
3.6.4.3-1	3.6.4.3-1
3.6.4.3-2	3.6.4.3-2
3.7.4-1	3.7.4-1
3.7.4-2	3.7.4-2
3.7.4-3	3.7.4-3
3.7.5-1	3.7.5-1
3.7.5-2	3.7.5-2
3.8.2-2	3.8.2-2
3.8.2-3	3.8.2-3
3.8.5-1	3.8.5-1
3.8.8-1	3.8.8-1
3.8.8-2	3.8.8-2

2. Pursuant to the Act and 10 CFR Part 70, NSPM to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operations, as described in the Final Safety Analysis Report, as supplemented and amended, and the licensee's filings dated August 16, 1974 (those portions dealing with handling of reactor fuel);

3. Pursuant to the Act and 10 CFR Parts 30, 40 and 70, NSPM to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

4. Pursuant to the Act and 10 CFR Parts 30, 40 and 70, NSPM to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

5. Pursuant to the Act and 10 CFR Parts 30 and 70, NSPM to possess, but not separate, such byproduct and special nuclear material as may be produced by operation of the facility.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission, now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

1. Maximum Power Level

   NSPM is authorized to operate the facility at steady state reactor core power levels not in excess of 2004 megawatts (thermal).

2. Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 198, are hereby incorporated in the license. NSPM shall operate the facility in accordance with the Technical Specifications.

3. Physical Protection

   NSPM shall implement and maintain in effect all provisions of the Commission-approved physical security, guard training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search

1.1 Definitions

CORE ALTERATION	CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components, within the reactor vessel with the vessel head removed and fuel in the vessel. The following exceptions are not considered to be CORE ALTERATIONS: a. Movement of source range monitors, local power range monitors, intermediate range monitors, traversing incore probes, or special movable detectors (including undervessel replacement); and b. Control rod movement, provided there are no fuel assemblies in the associated core cell. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.
CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific limits shall be determined for each reload cycle in accordance with Specification 5.6.3. Plant operation within these limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) that alone would produce the same dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The dose conversion factors used for this calculation shall be those listed in Federal Guidance Report (FGR)-11, "Limiting Values of Radionuclide Intake and Air Concentration Factors for Inhalation, Submersion and Ingestion," September 1988, and FGR-12, "External Exposure to Radionuclides in Air, Water and Soil," September 1993.
DRAIN TIME	The DRAIN TIME is the time it would take for the water inventory in and above the Reactor Pressure Vessel (RPV) to drain to the top of the active fuel (TAF) seated in the RPV assuming: a) The water inventory above the TAF is divided by the limiting drain rate; b) The limiting drain rate is the larger of the drain rate through a single penetration flow path with the highest flow rate, or the sum of the drain rates through multiple penetration flow paths susceptible to a common mode failure (e.g., seismic event, loss of normal power, single

1.1 Definitions

DRAIN TIME (continued)

human error), for all penetration flow paths below the TAF except:

1. Penetration flow paths connected to an intact closed system, or isolated by manual or automatic valves that are locked, sealed, or otherwise secured in the closed position, blank flanges, or other devices that prevent flow of reactor coolant through the penetration flow paths;

2. Penetration flow paths capable of being isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to the TAF when actuated by RPV water level isolation instrumentation; or

3. Penetration flow paths with isolation devices that can be closed prior to the RPV water level being equal to the TAF by a dedicated operator trained in the task, who in continuous communication with the control room, is stationed at the controls, and is capable of closing the penetration flow path isolation device without offsite power.

c) The penetration flow paths required to be evaluated per paragraph b) are assumed to open instantaneously and are not subsequently isolated, and no water is assumed to be subsequently added to the RPV water inventory;

d) No additional draining events occur; and

e) Realistic cross-sectional areas and drain rates are used.

A bounding DRAIN TIME may be used in lieu of a calculated value.

INSERVICE TESTING PROGRAM

The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f).

1.1 Definitions

LEAKAGE	LEAKAGE shall be: a. Identified LEAKAGE 1. LEAKAGE into the drywell, such as that from pump seals or valve packing that is captured and conducted to a sump or collecting tank; or 2. LEAKAGE into the drywell atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE; b. Unidentified LEAKAGE All LEAKAGE into the drywell that is not identified LEAKAGE; c. Total LEAKAGE Sum of the identified and unidentified LEAKAGE; and d. Pressure Boundary LEAKAGE LEAKAGE through a nonisolable fault in a Reactor Coolant System (RCS) component body, pipe wall, or vessel wall.
LINEAR HEAT GENERATION RATE (LHGR)	The LHGR shall be the heat generation rate per unit length of fuel rod. It is the integral of the heat flux over the heat transfer area associated with the unit length.
LOGIC SYSTEM FUNCTIONAL TEST	A LOGIC SYSTEM FUNCTIONAL TEST shall be a test of all logic components required for OPERABILITY of a logic circuit, from as close to the sensor as practicable up to, but not including, the actuated device, to verify OPERABILITY. The LOGIC SYSTEM FUNCTIONAL TEST may be performed by means of any series of sequential, overlapping, or total system steps so that the entire logic system is tested.
MINIMUM CRITICAL POWER RATIO (MCPR)	The MCPR shall be the smallest critical power ratio (CPR) that exists in the core for each class of fuel. The CPR is that power in the assembly that is calculated by application of the appropriate correlation(s) to cause some point in the assembly to experience boiling transition, divided by the actual assembly operating power.

1.1 Definitions

MODE	A MODE shall correspond to any one inclusive combination of mode switch position, average reactor coolant temperature, and reactor vessel head closure bolt tensioning specified in Table 1.1-1 with fuel in the reactor vessel.
OPERABLE – OPERABILITY	A system, subsystem, division, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety 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 safety function(s) are also capable of performing their related support function(s).
PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)	The PTLR is the unit specific document that provides the reactor vessel pressure and temperature limits, including heatup and cooldown rates, for the current reactor vessel fluence period. These pressure and temperature limits shall be determined for each fluence period in accordance with Specification 5.6.5.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 2004 MWt.
REACTOR PROTECTION SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from initiation of any RPS channel trip to the de-energization of the scram pilot valve solenoids. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.
SHUTDOWN MARGIN (SDM)	SDM shall be the amount of reactivity by which the reactor is subcritical or would be subcritical throughout the operating cycle assuming that: a. The reactor is xenon free; b. The moderator temperature is ≥ 68°F corresponding to the most reactive state; and c. All control rods are fully inserted except for the single control rod of highest reactivity worth, which is assumed to be fully withdrawn. With control rods not capable of being fully inserted, the reactivity worth of these control rods must be accounted for in the determination of SDM.

1.1 Definitions

STAGGERED TEST BASIS	A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.
TURBINE BYPASS SYSTEM RESPONSE TIME	The TURBINE BYPASS SYSTEM RESPONSE TIME shall be that time interval from when the main turbine trip solenoid is activated until 80% of the turbine bypass capacity is established. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

Table 1.1-1 (page 1 of 1)
MODES

MODE	TITLE	REACTOR MODE SWITCH POSITION	AVERAGE REACTOR COOLANT TEMPERATURE (°F)
1	Power Operation	Run	NA
2	Startup	Refuel[(a)] or Startup/Hot Standby	NA
3	Hot Shutdown[(a)]	Shutdown	> 212
4	Cold Shutdown[(a)]	Shutdown	≤ 212
5	Refueling[(b)]	Shutdown or Refuel	NA

(a) All reactor vessel head closure bolts fully tensioned.

(b) One or more reactor vessel head closure bolts less than fully tensioned.

3.3 INSTRUMENTATION

3.3.5.1 Emergency Core Cooling System (ECCS) Instrumentation

LCO 3.3.5.1 The ECCS instrumentation for each Function in Table 3.3.5.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5.1-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.5.1-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	B.1 ----------NOTE---------- Only applicable for Functions 1.a, 1.b, 2.a, 2.b, 2.f, 2.h, and 2.k. ---------- Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable. AND	1 hour from discovery of loss of initiation capability for feature(s) in both divisions

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	B.2	----------NOTE---------- Only applicable for Functions 3.a and 3.b. ----------	
		Declare High Pressure Coolant Injection (HPCI) System inoperable.	1 hour from discovery of loss of HPCI initiation capability
	AND		
	B.3	Place channel in trip.	24 hours
C. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	C.1	----------NOTE---------- Only applicable for Functions 1.c, 1.d, 1.e, 1.f, 2.c, 2.d, 2.e, 2.i, 2.j, 2.l, and 2.m. ----------	
		Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.	1 hour from discovery of loss of initiation capability for feature(s) in both divisions
	AND		
	C.2	Restore channel to OPERABLE status.	24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	D.1	----------NOTE---------- Only applicable if HPCI pump suction is not aligned to the suppression pool. ----------	
		Declare HPCI System inoperable.	1 hour from discovery of loss of HPCI initiation capability
	AND		
	D.2.1	Place channel in trip.	24 hours
	OR		
	D.2.2	Align the HPCI pump suction to the suppression pool.	24 hours
E. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	E.1	----------NOTE---------- Only applicable for Function 2.g. ----------	
		Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.	1 hour from discovery of loss of initiation capability for subsystems in both divisions
	AND		
	E.2	Restore channel to OPERABLE status.	7 days

Table 3.3.5.1-1 (page 1 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Vessel Water Level - Low Low	1, 2, 3	4[(a)]	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.7 SR 3.3.5.1.8	≥ -48 inches
b. Drywell Pressure - High	1, 2, 3	4[(a)]	B	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.8	≤ 2 psig
c. Reactor Steam Dome Pressure - Low (Injection Permissive)	1, 2, 3	2	C	SR 3.3.5.1.2 SR 3.3.5.1.4[(b)(c)] SR 3.3.5.1.8	≥ 397 psig and ≤ 440 psig
d. Reactor Steam Dome Pressure Permissive - Low (Pump Permissive)	1, 2, 3	2	C	SR 3.3.5.1.2 SR 3.3.5.1.4[(b)(c)] SR 3.3.5.1.8	≥ 397 psig
e. Reactor Steam Dome Pressure Permissive - Bypass Timer (Pump Permissive)	1, 2, 3	2	C	SR 3.3.5.1.7 SR 3.3.5.1.8	≤ 18 minutes

(a) Also required to initiate the associated emergency diesel generator (EDG).

(b) If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

(c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the nominal trip setpoint; otherwise, the channel shall be declared inoperable. The nominal trip setpoint and the methodology used to determine the as-found tolerance and the as-left tolerance are specified in the Technical Requirements Manual (TRM).

Table 3.3.5.1-1 (page 2 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
f. Core Spray Pump Start - Time Delay Relay	1, 2, 3	1 per pump	C	SR 3.3.5.1.7 SR 3.3.5.1.8	≤ 15.86 seconds
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Vessel Water Level - Low Low	1, 2, 3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.7 SR 3.3.5.1.8	≥ -48 inches
b. Drywell Pressure - High	1, 2, 3	4	B	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.8	≤ 2 psig
c. Reactor Steam Dome Pressure - Low (Injection Permissive)	1, 2, 3	2	C	SR 3.3.5.1.2 SR 3.3.5.1.4[(b)(c)] SR 3.3.5.1.8	≥ 397 psig and ≤ 440 psig
d. Reactor Steam Dome Pressure Permissive - Low (Pump Permissive)	1, 2, 3	2	C	SR 3.3.5.1.2 SR 3.3.5.1.4[(b)(c)] SR 3.3.5.1.8	≥ 397 psig

(b) If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

(c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the nominal trip setpoint; otherwise, the channel shall be declared inoperable. The nominal trip setpoint and the methodology used to determine the as-found tolerance and the as-left tolerance are specified in the TRM.

Table 3.3.5.1-1 (page 3 of 6)
Emergency Core Cooling System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2.	LPCI System					
e.	Reactor Steam Dome Pressure Permissive - Bypass Timer (Pump Permissive)	1, 2, 3	2	C	SR 3.3.5.1.7 SR 3.3.5.1.8	≤ 18 minutes
f.	Low Pressure Coolant Injection Pump Start - Time Delay Relay	1, 2, 3	4 per pump	B	SR 3.3.5.1.7 SR 3.3.5.1.8	
	Pumps A, B					≤ 5.33 seconds
	Pumps C, D					≤ 10.59 seconds
g.	Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	1, 2, 3	1 per pump	E	SR 3.3.5.1.2 SR 3.3.5.1.7 SR 3.3.5.1.8	≥ 360 gpm and ≤ 745 gpm
h.	Reactor Steam Dome Pressure - Low (Break Detection)	1, 2, 3	4	B	SR 3.3.5.1.2 SR 3.3.5.1.7 SR 3.3.5.1.8	≥ 873.6 psig and ≤ 923.4 psig
i.	Recirculation Pump Differential Pressure - High (Break Detection)	1, 2, 3	4 per pump	C	SR 3.3.5.1.2 SR 3.3.5.1.7 SR 3.3.5.1.8	≥ 63.5 inches wc
j.	Recirculation Riser Differential Pressure - High (Break Detection)	1, 2, 3	4	C	SR 3.3.5.1.2 SR 3.3.5.1.7[(b)(c)] SR 3.3.5.1.8	≤ 100.0 inches wc

(b) If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

(c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the nominal trip setpoint; otherwise, the channel shall be declared inoperable. The nominal trip setpoint and the methodology used to determine the as-found tolerance and the as-left tolerance are specified in the TRM.

Table 3.3.5.1-1 (page 4 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. LPCI System					
k. Recirculation Steam Dome Pressure - Time Delay Relay (Break Detection)	1, 2, 3	2	B	SR 3.3.5.1.7 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 2.97 seconds
l. Recirculation Pump Differential Pressure - Time Delay Relay (Break Detection)	1, 2, 3	2	C	SR 3.3.5.1.7 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 0.75 seconds
m. Recirculation Riser Differential Pressure - Time Delay Relay (Break Detection)	1, 2, 3	2	C	SR 3.3.5.1.7 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 0.75 seconds
3. High Pressure Coolant Injection (HPCI) System					
a. Reactor Vessel Water Level - Low Low	1, 2[(d)], 3[(d)]	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.7 SR 3.3.5.1.8	≥ -48 inches
b. Drywell Pressure - High	1, 2[(d)], 3[(d)]	4	B	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.8	≤ 2 psig
c. Reactor Vessel Water Level - High	1, 2[(d)], 3[(d)]	2	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.7 SR 3.3.5.1.8	≤ 48 inches
d. Condensate Storage Tank Level - Low	1, 2[(d)], 3[(d)]	2	D	SR 3.3.5.1.7 SR 3.3.5.1.8	≥ 29.3 inches
e. Suppression Pool Water Level - High	1, 2[(d)], 3[(d)]	2	D	SR 3.3.5.1.5 SR 3.3.5.1.6 SR 3.3.5.1.8	≤ 3.0 inches
f. High Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	1, 2[(d)], 3[(d)]	1	E	SR 3.3.5.1.5 SR 3.3.5.1.6 SR 3.3.5.1.8	≥ 362 gpm and ≤ 849 gpm

(d) With reactor steam dome pressure > 150 psig.

Table 3.3.5.1-1 (page 5 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. Automatic Depressurization System (ADS) Trip System A					
a. Reactor Vessel Water Level - Low Low	1, 2[(d)], 3[(d)]	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.7 SR 3.3.5.1.8	≥ -48 inches
b. Automatic Depressurization System Initiation Timer	1, 2[(d)], 3[(d)]	1	G	SR 3.3.5.1.7 SR 3.3.5.1.8	≤ 120 seconds
c. Core Spray Pump Discharge Pressure - High	1, 2[(d)], 3[(d)]	2	G	SR 3.3.5.1.2 SR 3.3.5.1.4[(b)(c)] SR 3.3.5.1.8	≥ 75 psig and ≤ 125 psig
d. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, 2[(d)], 3[(d)]	4	G	SR 3.3.5.1.2 SR 3.3.5.1.4[(b)(c)] SR 3.3.5.1.8	≥ 75 psig and ≤ 125 psig
5. ADS Trip System B					
a. Reactor Vessel Water Level - Low Low	1, 2[(d)], 3[(d)]	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.7 SR 3.3.5.1.8	≥ -48 inches
b. Automatic Depressurization System Initiation Timer	1, 2[(d)], 3[(d)]	1	G	SR 3.3.5.1.7 SR 3.3.5.1.8	≤ 120 seconds

(b) If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

(c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the nominal trip setpoint; otherwise, the channel shall be declared inoperable. The nominal trip setpoint and the methodology used to determine the as-found tolerance and the as-left tolerance are specified in the TRM.

(d) With reactor steam dome pressure > 150 psig.

Table 3.3.5.1-1 (page 6 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. ADS Trip System B					
c. Core Spray Pump Discharge Pressure - High	1, 2[(d)], 3[(d)]	2	G	SR 3.3.5.1.2 SR 3.3.5.1.4[(b)(c)] SR 3.3.5.1.8	≥ 75 psig and ≤ 125 psig
d. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, 2[(d)], 3[(d)]	4	G	SR 3.3.5.1.2 SR 3.3.5.1.4[(b)(c)] SR 3.3.5.1.8	≥ 75 psig and ≤ 125 psig

(b) If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

(c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the nominal trip setpoint; otherwise, the channel shall be declared inoperable. The nominal trip setpoint and the methodology used to determine the as-found tolerance and the as-left tolerance are specified in the TRM.

(d) With reactor steam dome pressure > 150 psig.

3.3 INSTRUMENTATION

3.3.5.3 Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation

LCO 3.3.5.3 The RPV Water Inventory Control instrumentation for each Function in Table 3.3.5.3-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5.3-1.

ACTIONS

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

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more channels inoperable.	A.1	Enter the Condition referenced in Table 3.3.5.3-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	B.1	Declare associated penetration flow path(s) incapable of automatic isolation.	Immediately
	AND		
	B.2	Calculate DRAIN TIME.	Immediately
C. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	C.1	Place channel in trip.	1 hour
D. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	D.1	Restore channel to OPERABLE status.	24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Declare associated low pressure ECCS injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.5.3-1 to determine which SRs apply for each ECCS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.5.3.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.5.3.2	Perform CHANNEL FUNCTIONAL TEST.	92 days

Table 3.3.5.3-1 (page 1 of 1)
RPV Water Inventory Control Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Steam Dome Pressure - Low (Injection Permissive)	4, 5	2[(a)]	C	SR 3.3.5.3.2	≥ 397 psig and ≤ 440 psig
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Steam Dome Pressure - Low (Injection Permissive)	4, 5	2[(a)]	C	SR 3.3.5.3.2	≥ 397 psig and ≤ 440 psig
b. Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	4, 5	1 per pump[(a)]	D	SR 3.3.5.3.2	≥ 360 gpm and ≤ 745 gpm
3. Shutdown Cooling System Isolation					
a. Reactor Vessel Water Level - Low	(b)	2 in one trip system	B	SR 3.3.5.3.1 SR 3.3.5.3.2	≥ 7 inches
4. Reactor Water Cleanup (RWCU) System Isolation					
a. Reactor Vessel Water Level - Low Low	(b)	2 in one trip system	B	SR 3.3.5.3.1 SR 3.3.5.3.2	≥ -48 inches

(a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.2, "Reactor Pressure Vessel (RPV) Water Inventory Control."

(b) When automatic isolation of the associated penetration flow path(s) is credited in calculating DRAIN TIME.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	I.1 Initiate action to restore channel to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Primary Containment Isolation Function.

2. 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 primary containment isolation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.6.1.2	Perform CHANNEL FUNCTIONAL TEST.	92 days
SR 3.3.6.1.3	Calibrate the trip unit.	92 days
SR 3.3.6.1.4	Perform CHANNEL CALIBRATION.	92 days

Table 3.3.6.1-1 (page 3 of 3)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. RWCU System Isolation					
d. SLC System Initiation	1, 2, 3	1	H	SR 3.3.6.1.6	NA
e. Reactor Vessel Water Level - Low Low	1, 2, 3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≥ -48 inches
6. Shutdown Cooling System Isolation					
a. Reactor Steam Dome Pressure - High	1, 2, 3	2	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 81.8 psig
b. Reactor Vessel Water Level - Low	3	2	I	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≥ 7 inches
7. Traversing Incore Probe System Isolation					
a. Reactor Vessel Water Level - Low	1, 2, 3	2	G	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≥ 7 inches
b. Drywell Pressure - High	1, 2, 3	2	G	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 2.0 psig

Table 3.3.6.2-1 (page 1 of 1)
Secondary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low Low	1, 2, 3	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.3 SR 3.3.6.2.5 SR 3.3.6.2.6	≥ -48 inches
2. Drywell Pressure - High	1, 2, 3	2	SR 3.3.6.2.2 SR 3.3.6.2.4 SR 3.3.6.2.6	≤ 2 psig
3. Reactor Building Ventilation Exhaust Radiation - High	1, 2, 3, (a)	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.4 SR 3.3.6.2.6	≤ 100 mR/hr
4. Refueling Floor Radiation - High	1, 2, 3, (a)	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.4 SR 3.3.6.2.6	≤ 100 mR/hr

(a) During movement of recently irradiated fuel assemblies in secondary containment.

Table 3.3.7.1-1 (Page 1 of 1)
Control Room Emergency Filtration System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low Low	1, 2, 3	2	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.5 SR 3.3.7.1.6	≥ -48 inches
2. Drywell Pressure - High	1, 2, 3	2	SR 3.3.7.1.2 SR 3.3.7.1.4 SR 3.3.7.1.6	≤ 2 psig
3. Reactor Building Ventilation Exhaust Radiation - High	1, 2, 3, (a)	2	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.4 SR 3.3.7.1.6	≤ 100 mR/hr
4. Refueling Floor Radiation - High	1, 2, 3, (a)	2	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.4 SR 3.3.7.1.6	≤ 100 mR/hr

(a) During movement of recently irradiated fuel assemblies in the secondary containment.

3.3 INSTRUMENTATION

3.3.8.2 Reactor Protection System (RPS) Electric Power Monitoring

LCO 3.3.8.2 Two RPS electric power monitoring assemblies shall be OPERABLE for each inservice RPS motor generator set or alternate power supply.

APPLICABILITY: MODES 1, 2, and 3,
MODES 4 and 5 with residual heat removal (RHR) shutdown cooling supply isolation valves open,
MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies,
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or both inservice power supplies with one electric power monitoring assembly inoperable.	A.1 Remove associated inservice power supply(s) from service.	72 hours
B. One or both inservice power supplies with both electric power monitoring assemblies inoperable.	B.1 Remove associated inservice power supply(s) from service.	1 hour
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A or B not met in MODE 4 or 5 with RHR shutdown cooling supply isolation valves open.	D.1 Initiate action to restore one electric power monitoring assembly to OPERABLE status for inservice power supply(s) supplying required instrumentation. OR D.2 Initiate action to isolate the RHR Shutdown Cooling System.	Immediately Immediately
E. Required Action and associated Completion Time of Condition A or B not met in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies.	E.1 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately
F. Required Action and associated Completion Time of Condition A or B not met during movement of recently irradiated fuel assemblies in the secondary containment.	F.1.1 Isolate the associated secondary containment penetration flow path(s). OR F.1.2 Declare the associated secondary containment isolation valve(s) inoperable. AND F.2.1 Place the associated standby gas treatment (SGT) subsystem(s) in operation. OR	Immediately Immediately Immediately

3.5 EMERGENCY CORE COOLING SYSTEM (ECCS), RPV WATER INVENTORY CONTROL, AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.1 ECCS - Operating

LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of three safety/relief valves shall be OPERABLE.

---NOTE---
Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) shutdown cooling supply isolation interlock in MODE 3, if capable of being manually realigned and not otherwise inoperable.

APPLICABILITY: MODE 1,
MODES 2 and 3, except high pressure coolant injection (HPCI) and ADS valves are not required to be OPERABLE with reactor steam dome pressure ≤ 150 psig.

ACTIONS

---NOTE---
LCO 3.0.4.b is not applicable to HPCI.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One LPCI pump inoperable.	A.1 Restore LPCI pump to OPERABLE status.	30 days
B. One LPCI subsystem inoperable for reasons other than Condition A. OR One Core Spray subsystem inoperable.	B.1 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	7 days

3.5 EMERGENCY CORE COOLING SYSTEM (ECCS), RPV WATER INVENTORY CONTROL, AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.2 Reactor Pressure Vessel (RPV) Water Inventory Control

LCO 3.5.2 DRAIN TIME of RPV water inventory to the top of active fuel (TAF) shall be ≥ 36 hours.

AND

One low pressure ECCS injection/spray subsystem shall be OPERABLE.

---NOTE---
A Low Pressure Coolant Injection (LPCI) subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable.

APPLICABILITY: MODES 4 and 5

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required ECCS injection/spray subsystem inoperable.	A.1 Restore required ECCS injection/spray subsystem to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action to establish a method of water injection capable of operating without offsite electrical power.	Immediately
C. DRAIN TIME < 36 hours and ≥ 8 hours.	C.1 Verify secondary containment boundary is capable of being established in less than the DRAIN TIME. AND	4 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	C.2	Verify each secondary containment penetration flow path is capable of being isolated in less than the DRAIN TIME.	4 hours
	AND		
	C.3	Verify one standby gas treatment subsystem is capable of being placed in operation in less than the DRAIN TIME.	4 hours
D. DRAIN TIME < 8 hours.	D.1	---------- NOTE ---------- Required ECCS injection/spray subsystem or additional method of water injection shall be capable of operating without offsite electrical power. ---------- Initiate action to establish an additional method of water injection with water sources capable of maintaining RPV water level > TAF for ≥ 36 hours.	Immediately
	AND		
	D.2	Initiate action to restore secondary containment boundary.	Immediately
	AND		

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	D.3 Initiate action to isolate each secondary containment penetration flow path or verify it can be manually isolated from the control room. AND	Immediately
	D.4 Initiate action to verify one standby gas treatment subsystem is capable of being placed in operation.	Immediately
E. Required Action and associated Completion Time of Condition C or D not met. OR DRAIN TIME < 1 hour.	E.1 Initiate action to restore DRAIN TIME to ≥ 36 hours.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify, for the required ECCS injection/spray subsystem, the: a. Suppression pool water level is ≥ -3 ft; or b. Condensate storage tank(s) water level is ≥ 7 ft for one tank operation and ≥ 4 ft for two tank operation.	12 hours

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.5.2.2	Verify, for the required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	31 days
SR 3.5.2.3	----------NOTE---------- Not required to be met for system vent flow paths opened under administrative control. ----------	
	Verify, for the required ECCS injection/spray subsystem, each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.2.4	Operate the required ECCS injection/spray subsystem for ≥ 10 minutes.	92 days
SR 3.5.2.5	----------NOTE---------- Vessel injection/spray may be excluded. ----------	
	Verify the required ECCS injection/spray subsystem can be manually operated.	24 months
SR 3.5.2.6	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	24 months
SR 3.5.2.7	Verify DRAIN TIME ≥ 36 hours.	12 hours

3.5 EMERGENCY CORE COOLING SYSTEM (ECCS), RPV WATER INVENTORY CONTROL, AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.3 RCIC System

LCO 3.5.3 The RCIC System shall be OPERABLE.

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

ACTIONS

---NOTE---

LCO 3.0.4.b is not applicable to the RCIC System.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. RCIC System inoperable.	A.1	Verify by administrative means High Pressure Coolant Injection System is OPERABLE.	Immediately
	AND		
	A.2	Restore RCIC System to OPERABLE status.	14 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	12 hours
	AND		
	B.2	Reduce reactor steam dome pressure to ≤ 150 psig.	36 hours

3.6 CONTAINMENT SYSTEMS

3.6.1.3 Primary Containment Isolation Valves (PCIVs)

LCO 3.6.1.3 Each PCIV, except reactor building-to-suppression chamber vacuum breakers, shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

----------NOTES----------

1. Penetration flow paths may be unisolated intermittently under administrative controls.
2. Separate Condition entry is allowed for each penetration flow path.
3. Enter applicable Conditions and Required Actions for systems made inoperable by PCIVs.
4. Enter applicable Conditions and Required Actions of LCO 3.6.1.1, "Primary Containment," when PCIV leakage results in exceeding overall containment leakage rate acceptance criteria.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Only applicable to penetration flow paths with two PCIVs. ---------- One or more penetration flow paths with one PCIV inoperable for reasons other than Condition D or E.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. AND	4 hours except for main steam line AND 8 hours for main steam line

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more penetration flow paths with one or more 18 inch primary containment purge and vent valves not within purge and vent valve leakage limits.	D.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange. AND D.2 ----------NOTES---------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------- Verify the affected penetration flow path is isolated.	24 hours Once per 31 days for isolation devices outside containment
E. One or more MSIVs with leakage rate not within limits.	E.1 Restore leakage rate to within limits.	8 hours
F. Required Action and associated Completion Time of Condition A, B, C, or D not met in MODE 1, 2, or 3.	F.1 Be in MODE 3. AND F.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.1	----------NOTE---------- Not required to be met when the 18 inch primary containment purge and vent valves are open for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open. ---------- Verify each 18 inch primary containment purge and vent valve is closed.	31 days

3.6 CONTAINMENT SYSTEMS

3.6.4.1 Secondary Containment

LCO 3.6.4.1 The secondary containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Secondary containment inoperable in MODE 1, 2, or 3.	A.1 Restore secondary containment to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours
C. Secondary containment inoperable during movement of recently irradiated fuel assemblies in the secondary containment.	C.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately

3.6 CONTAINMENT SYSTEMS

3.6.4.2 Secondary Containment Isolation Valves (SCIVs)

LCO 3.6.4.2 Each SCIV shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

----------NOTES----------

1. Penetration flow paths may be unisolated intermittently under administrative controls.
2. Separate Condition entry is allowed for each penetration flow path.
3. Enter applicable Conditions and Required Actions for systems made inoperable by SCIVs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more penetration flow paths with one SCIV inoperable.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange. AND	8 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A or B not met during movement of recently irradiated fuel assemblies in the secondary containment.	D.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.2.1	----------NOTES---------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for SCIVs that are open under administrative controls. ---------- Verify each secondary containment isolation manual valve and blind flange that is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	31 days
SR 3.6.4.2.2	Verify the isolation time of each power operated, automatic SCIV is within limits.	92 days
SR 3.6.4.2.3	Verify each automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	24 months

3.6 CONTAINMENT SYSTEMS

3.6.4.3 Standby Gas Treatment (SGT) System

LCO 3.6.4.3 Two SGT subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SGT subsystem inoperable.	A.1 Restore SGT subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, or 3.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours
C. Required Action and associated Completion Time of Condition A not met during movement of recently irradiated fuel assemblies in the secondary containment.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- C.1 Place OPERABLE SGT subsystem in operation. OR C.2 Suspend movement of recently irradiated fuel assemblies in secondary containment.	 Immediately Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two SGT subsystems inoperable in MODE 1, 2, or 3.	D.1 Enter LCO 3.0.3.	Immediately
E. Two SGT subsystems inoperable during movement of recently irradiated fuel assemblies in the secondary containment.	E.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- Suspend movement of recently irradiated fuel assemblies in secondary containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for ≥ 15 continuous minutes.	31 days
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	24 months

3.7 PLANT SYSTEMS

3.7.4 Control Room Emergency Filtration (CREF) System

LCO 3.7.4 Two CREF subsystems shall be OPERABLE.

---NOTE---
The control room envelope (CRE) boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CREF subsystem inoperable for reasons other than Condition B.	A.1 Restore CREF subsystem to OPERABLE status.	7 days
B. One or more CREF subsystems inoperable due to inoperable CRE boundary in MODE 1, 2, or 3.	B.1 Initiate action to implement mitigating actions. AND B.2 Verify mitigating actions ensure CRE occupant exposures to radiological, chemical and smoke hazards will not exceed limits. AND B.3 Restore CRE boundary to OPERABLE status.	Immediately 24 hours 90 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours
D. Required Action and associated Completion Time of Condition A not met during movement of recently irradiated fuel assemblies in the secondary containment.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- D.1 Place OPERABLE CREF subsystem in pressurization mode. OR D.2 Suspend movement of recently irradiated fuel assemblies in the secondary containment.	 Immediately Immediately
E. Two CREF subsystems inoperable in MODE 1, 2, or 3 for reasons other than Condition B.	E.1 Enter LCO 3.0.3.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Two CREF subsystems inoperable during movement of recently irradiated fuel assemblies in the secondary containment. OR One or more CREF subsystems inoperable due to an inoperable CRE boundary during movement of recently irradiated fuel assemblies in the secondary containment.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- F.1 Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Operate each CREF subsystem for ≥ 15 continuous minutes.	31 days
SR 3.7.4.2	Perform required CREF filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.4.3	Verify each CREF subsystem actuates on an actual or simulated initiation signal.	24 months
SR 3.7.4.4	Perform required CRE unfiltered air in-leakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

3.7 PLANT SYSTEMS

3.7.5 Control Room Ventilation System

LCO 3.7.5 Two control room ventilation subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One control room ventilation subsystem inoperable.	A.1 Restore control room ventilation subsystem to OPERABLE status.	30 days
B. Two control room ventilation subsystems inoperable.	B.1 Verify control room area temperature < 90°F. AND B.2 Restore one control room ventilation subsystem to OPERABLE status.	Once per 4 hours 72 hours
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours
D. Required Action and associated Completion Time of Condition A not met during movement of recently irradiated fuel assemblies in the secondary containment.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- D.1 Place OPERABLE control room ventilation subsystem in operation. OR	 Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	D.2 Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately
E. Required Action and associated Completion Time of Condition B not met during movement of recently irradiated fuel assemblies in the secondary containment.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- E.1 Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify each control room ventilation subsystem has the capability to remove the assumed heat load.	24 months

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.2.1 Suspend CORE ALTERATIONS. AND A.2.2 Suspend movement of recently irradiated fuel assemblies in the secondary containment. AND A.2.3 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately Immediately Immediately
B. One required EDG inoperable.	B.1 Suspend CORE ALTERATIONS. AND B.2 Suspend movement of recently irradiated fuel assemblies in the secondary containment. AND B.3 Initiate action to restore required EDG to OPERABLE status.	Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.2.1	----------NOTES---------- 1. The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.7, and SR 3.8.1.8 through SR 3.8.1.13. 2. SR 3.8.1.8 and SR 3.8.1.12 are not required to be met when associated ECCS subsystem(s) are not required to be OPERABLE per LCO 3.5.2, "RPV Water Inventory Control." ----------	
	For AC sources required to be OPERABLE the SRs of Specification 3.8.1, except SR 3.8.1.6, are applicable.	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources - Shutdown

LCO 3.8.5 Division 1 or Division 2 125 VDC electrical power subsystem shall be OPERABLE to support one division of the DC Electrical Power Distribution System required by LCO 3.8.8, "Distribution Systems - Shutdown."

APPLICABILITY: MODES 4 and 5,
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

---NOTE---

LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required DC electrical power subsystem inoperable.	A.1 Suspend CORE ALTERATIONS. AND A.2 Suspend movement of recently irradiated fuel assemblies in the secondary containment. AND A.3 Initiate action to restore required DC electrical power subsystem to OPERABLE status.	Immediately Immediately Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Distribution Systems - Shutdown

LCO 3.8.8 The necessary portions of the AC and DC electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY: MODES 4 and 5,
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

---NOTE---
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC or DC electrical power distribution subsystems inoperable.	A.1 Declare associated supported required feature(s) inoperable. OR A.2.1 Suspend CORE ALTERATIONS. AND A.2.2 Suspend handling of recently irradiated fuel assemblies in the secondary containment. AND	Immediately Immediately Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.2.3 Initiate actions to restore required AC and DC electrical power distribution subsystems to OPERABLE status. AND	Immediately
	A.2.4 Declare associated required shutdown cooling subsystem(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct breaker alignments and voltage to required AC and DC electrical power distribution subsystems.	7 days

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 198 TO

RENEWED FACILITY OPERATING LICENSE NO. DPR-22

NORTHERN STATES POWER COMPANY

MONTICELLO NUCLEAR GENERATING PLANT

DOCKET NO. 50-263

1.0 INTRODUCTION

By application dated October 20, 2017 (Reference 1), and supplemented by letters dated June 1, 2018 (Reference 2), and September 11, 2018 (Reference 3), Northern States Power Company, doing business as Xcel Energy (NSPM, the licensee,) requested to adopt Technical Specifications Task Force (TSTF) Traveler TSTF-542, (Reference 4), "Reactor Pressure Vessel Water Inventory Control [RPV WIC]," Revision 2, which changes the technical specifications (TSs) for the Monticello Nuclear Generating Plant (MNGP). Traveler TSTF-542, Revision 2, was approved by the U.S. Nuclear Regulatory Commission (NRC, the Commission) on December 20, 2016 (Reference 5).

The proposed changes would replace existing TSs requirements associated with "operations with a potential for draining the reactor vessel," (OPDRVs) with revised TSs providing alternative requirements for RPV WIC. These alternative requirements would protect Safety Limit TS 2.1.1.4, which states, "Reactor vessel water level shall be greater than the top of active irradiated fuel."

Additionally, a new definition "DRAIN TIME" would be added to the MNGP TSs, Section 1.1, "Definitions." DRAIN TIME would establish requirements for the licensee to make RPV water level inventory determinations and to calculate RPV water inventory drain rates for Modes 4 and 5 outage-related activities. Adequate licensee management of secondary containment requirements or mitigation of certain emergency core cooling system (ECCS) safety injection/spray systems during Modes 4 and 5 requires a properly calculated DRAIN TIME.

The license amendment request (LAR) has proposed several variations from the TS changes described in the applicable parts of TSTF-542, Revision 2, or the NRC-approved TSTF-542 safety evaluation (SE). These are explained below in Section 2.2.5 and evaluated in Section 3.5.

The supplements dated June 1, 2018, and September 11, 2018, provided additional information that clarified the application, but did not expand the scope of the application or change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on December 19, 2017 (82 FR 60228).

2.0 REGULATORY EVALUATION

2.1 System Description

The boiling-water reactor (BWR) RPVs have a number of penetrations located below the top of active fuel (TAF). These penetrations provide entry for control rods, recirculation flow, reactor water cleanup, and shutdown cooling (SDC). Since these penetrations are below the TAF, this creates a potential to drain the reactor vessel water inventory and lose effective core cooling. The loss of water inventory and effective core cooling can potentially lead to fuel cladding failure and radioactive release.

During operation in Modes 1 (Power Operation – Reactor Mode Switch in Run), 2 (Startup – Reactor Mode Switch in Refuel[1] or Startup/Hot Standby), and 3 (Hot Shutdown[1] - Reactor Mode Switch in Shutdown and average reactor coolant temperature > 212 °F (degrees Fahrenheit)), the TS for instrumentation and ECCSs require operability of sufficient equipment to ensure large quantities of water will be injected into the vessel should level decrease below the preselected value. These requirements are designed to mitigate the effects of a loss-of-coolant accident (LOCA), but also provide protection for other accidents and transients that involve a water inventory loss.

During BWR operation in Mode 4 (Cold Shutdown[1] – Reactor Mode Switch in Shutdown and average reactor coolant temperature ≤ 212 °F), and Mode 5 (Refueling[2]- Reactor Mode Switch in Shutdown or Refuel), the pressures and temperatures that could cause a LOCA are not present. During certain phases of refueling (Mode 5) a large volume of water is available above the RPV (i.e., the head is removed), the water level is ≥ 21 feet 11 inches over the top of the RPV flange, and the spent fuel storage pool gates are removed.

The large volume of water available in and above the RPV (during much of the time when in Mode 5) provides time for operator detection and manual operator action to stop and mitigate an RPV draining event. However, typically at other times during a refueling outage, during Cold Shutdown (Mode 4) or Refueling (Mode 5), there may be a potential for significant drainage paths from certain outage activities, human error, and other events when it is more likely to have some normally available equipment, instrumentation, and systems inoperable due to maintenance and outage activities. There may not be as much time for operator action as compared to times when there are large volumes of water above the RPV.

In comparison to Modes 1, 2, and 3, with typical high temperatures and pressures (especially in Modes 1 and 2), Modes 4 and 5 generally do not have the high pressure and temperature considered necessary for a LOCA envisioned from a high energy pipe failure. Thus, while the potential sudden loss of large volumes of water from a LOCA are not expected, operators monitor for BWR RPV water level decrease from potentially significant or unexpected drainage paths. These potential drainage paths in Modes 4 and 5 generally would require less water replacement capability to maintain water above the TAF.

---

[1] With all reactor vessel head closure bolts fully tensioned.

[2] One or more reactor vessel head closure bolts less than fully tensioned.

To address the drain down potential during Modes 4 and 5, the current MNGP TSs contain specifications that are applicable during an OPDRV, or require suspension of OPDRVs if certain equipment is inoperable. The term OPDRV is not specifically defined in the TSs and historically has been subject to inconsistent application by licensees. The changes discussed in this SE are intended to resolve any ambiguity by creating a new RPV WIC TS with attendant equipment operability requirements, required actions, and surveillance requirements (SRs) and deleting references to OPDRVs throughout the TS.

2.2 Proposed TS Changes

Section 2.2.1 describes the proposed addition of a new definition, "DRAIN TIME" (evaluated below in Section 3.1).

Section 2.2.2 describes the proposed revisions; (1) TS 3.3, "Instrumentation," including the proposed revisions to TS 3.3.5.1, "ECCS Instrumentation"; (2) proposed addition of new TS 3.3.5.3, "Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation" (including Table 3.3.5.3-1); and (3) proposed revisions to TS pages for TS 3.3.6.1, "Primary Containment Isolation Instrumentation" (including Table 3.3.6.1-1). Section 2.2.2 is evaluated below in Sections 3.2 and 3.4.

Section 2.2.3 describes the proposed revisions to TS 3.5, "Emergency Core Cooling Systems System (ECCS) and Reactor Core Isolation Cooling (RCIC) System," including the proposed revisions to TS 3.5.2 "ECCS - Shutdown" (evaluated below in Section 3.3).

Section 2.2.4 describes the proposed deletion of existing TS references to OPDRVs (evaluated below in Section 3.6).

Section 2.2.5 describes MNGP plant-specific variations to TSTF-542, Revision 2 (evaluated below in Section 3.5).

2.2.1 Addition of "DRAIN TIME" Definition

The following definition of "DRAIN TIME" would be added to Section 1.1, "Definitions":

> The DRAIN TIME is the time it would take for the water inventory in and above the Reactor Pressure Vessel (RPV) to drain to the top of the active fuel (TAF) seated in the RPV assuming:
>
> a) The water inventory above the TAF is divided by the limiting drain rate;
>
> b) The limiting drain rate is the larger of the drain rate through a single penetration flow path with the highest flow rate, or the sum of the drain rates through multiple penetration flow paths susceptible to a common mode failure (e.g., seismic event, loss of normal power, single human error), for all penetration flow paths below the TAF except:
>
> 1. Penetration flow paths connected to an intact closed system, or isolated by manual or automatic valves that are locked, sealed, or otherwise secured in the closed position, blank flanges, or other devices that prevent flow of reactor coolant through the penetration flow paths;

2. Penetration flow paths capable of being isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to the TAF when actuated by RPV water level isolation instrumentation; or

3. Penetration flow paths with isolation devices that can be closed prior to the RPV water level being equal to the TAF by a dedicated operator trained in the task, who is in continuous communication with the control room, is stationed at the controls, and is capable of closing the penetration flow path isolation device without offsite power.

c) The penetration flow paths required to be evaluated per paragraph b) are assumed to open instantaneously and are not subsequently isolated, and no water is assumed to be subsequently added to the RPV water inventory;

d) No additional draining events occur; and

e) Realistic cross-sectional areas and drain rates are used.

A bounding DRAIN TIME may be used in lieu of a calculated value.

2.2.2 TS 3.3, "Instrumentation"

The following subsections describe the existing and proposed changes to the MNGP TS, Section 3.3, "Instrumentation."

2.2.2.1 TS 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation"

Proposed changes to TS 3.3.5.1 include the deletion of Note 1 in Required Actions B.1, C.1, and E.1, which states:

"Only applicable in MODES 1, 2, and 3."

As a result, the numbering for Note 2 would be removed with no change in the note.

For TS Table 3.3.5.1-1, the applicability in Modes 4 and 5 was proposed for deletion because the instrumentation requirements during shutdown would be consolidated into the new TS 3.3.5.3, "RPV Water Inventory Control Instrumentation." Modes 4 and 5 Applicability and associated requirements would be deleted for the following functions:

1. Core Spray System;
   (a) Reactor Vessel Water Level - Low Low
   (c) Reactor Steam Dome Pressure - Low (Injection Permissive)
   (d) Reactor Steam Dome Pressure Permissive - Low (Pump Permissive)
   (e) Reactor Steam Dome Pressure Permissive - Bypass Timer (Pump Permissive)
   (f) Core Spray Pump Start - Time Delay Relay

2. Low Pressure Coolant Injection (LPCI) System;
   (a) Reactor Vessel Water Level - Low Low
   (c) Reactor Steam Dome Pressure - Low (Injection Permissive)
   (d) Reactor Steam Dome Pressure Permissive - Low (Pump Permissive)

(e) Reactor Steam Dome Pressure Permissive - Bypass Timer (Pump Permissive)
(f) Low Pressure Coolant Injection Pump Start - Time Delay Relay
(g) Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)

Table 3.3.5.1-1, Footnote (a), which states, "When the associated ECCS subsystem(s) are required to be OPERABLE per LCO 3.5.2," would be deleted. Existing Footnotes (b), (c), (d), and (e) would be renumbered as Footnotes (a), (b), (c), and (d), respectively. The proposed new TS 3.3.5.3 is shown below.

2.2.2.2 New TS 3.3.5.3, "Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation"

The proposed new TS 3.3.5.3 would contain existing 'ECCS' and 'Primary Containment Isolation' instrumentation functions that are relocated from TSs 3.3.5.1 and 3.3.6.1, as well as new requirements.

The proposed new TS 3.3.5.3 is shown below:

3.3.5.3 Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation

LCO 3.3.5.3 The RPV Water Inventory Control instrumentation for each Function in Table 3.3.5.3-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5.3-1

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.5.3-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	B.1 Declare associated penetration flow path(s) incapable of automatic isolation. AND B.2 Calculate DRAIN TIME.	Immediately Immediately
C. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	C.1 Place channel in trip.	1 hour
D. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	D.1 Restore channel to OPERABLE status.	24 hours

E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Declare associated low pressure ECCS injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------

Refer to Table 3.3.5.3-1 to determine which SRs apply for each ECCS Function.

SURVEILLANCE	FREQUENCY
SR 3.3.5.3.1 Perform CHANNEL CHECK.	12 hours
SR 3.3.5.3.2 Perform CHANNEL FUNCTIONAL TEST.	92 days

Table 3.3.5.3-1 (Page 1 of 1)
RPV Water Inventory Control Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Steam Dome Pressure – Low (Injection Permissive)	4,5	2[(a)]	C	SR 3.3.5.3.2	≥ 397 psig and ≤ 440 psig
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Steam Dome Pressure – Low (Injection Permissive)	4,5	2[(a)]	C	SR 3.3.5.3.2	≥ 397 psig and ≤ 440 psig
b. Low Pressure Coolant Injection Pump Discharge Flow-Low (Bypass)	4,5	1 per pump[(a)]	D	SR 3.3.5.3.2	≥ 360 gpm and ≤ 745 gpm
3. Shutdown Cooling System Isolation					
a. Reactor Vessel Water Level – Low	(b)	2 in one trip system	B	SR 3.3.5.3.1 SR 3.3.5.3.2	≥ 7 inches
4. Reactor Water Cleanup (RWCU) System Isolation					
a. Reactor Vessel Water Level – Low Low	(b)	2 in one trip system	B	SR 3.3.5.3.1 SR 3.3.5.3.2	≥ - 48 inches

a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.2, "Reactor Pressure Vessel (RPV) Water Inventory Control."

b) When automatic isolation of the associated penetration flow path(s) is credited in calculating DRAIN TIME.

2.2.2.3 TS 3.3.6.1, "Primary Containment Isolation Instrumentation"

In TS Table 3.3.6.1-1, Function 6.b, Shutdown Cooling System Isolation, Reactor Vessel Water Level – Low, the applicability in Modes 4 and 5 was proposed for deletion. Also, Footnote (a) to Table 3.3.6.1-1 was proposed to be deleted, as it is applicable only to Function 6.b during Modes 4 and 5. Footnote (a) is related to residual heat removal (RHR) SDC system integrity. This function would be moved to the new TS Table 3.3.5.3-1, Function 3.a, as shown in Section 2.2.2.2 of this SE.

In TS limiting condition for operation (LCO) 3.3.6.1, Required Action I.2, was proposed for deletion since it was associated with the isolation of RHR Shutdown Cooling System during Modes 4 and 5.

2.2.3 TS Section 3.5, "Emergency Core Cooling Systems (ECCS) and Reactor Core Isolation Cooling System (RCIC) System"

The title of MNGP TS Section 3.5 would be revised from "Emergency Core Cooling System (ECCS) and Reactor Core Isolation Cooling System (RCIC)" to "Emergency Core Cooling Systems (ECCS), RPV Water Inventory Control, and Reactor Core Isolation Cooling (RCIC) System."

The title of MNGP TS, Section 3.5.2, would be revised from "ECCS - Shutdown" to "Reactor Pressure Vessel (RPV) Water Inventory Control," and TS 3.5.2 would be revised as follows:

LCO 3.5.2 DRAIN TIME of RPV water inventory to the top of active fuel (TAF) shall be ≥ 36 hours.

AND

One low pressure ECCS injection/spray subsystem shall be OPERABLE.

----------NOTE----------
A low pressure coolant injection (LPCI) subsystem may be considered OPERABLE during alignment and operation for decay heat removal (DHR) if capable of being manually realigned and not otherwise inoperable.

APPLICABILITY: MODES 4 and 5

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required ECCS injection/spray subsystem inoperable.	A.1 Restore required ECCS injection/spray subsystem to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action to establish a method of water injection capable of operating without offsite electrical power.	Immediately
C. DRAIN TIME < 36 hours and ≥ 8 hours.	C.1 Verify secondary containment boundary is capable of being established in less than the DRAIN TIME.	4 hours

	AND C.2 Verify each secondary containment penetration flow path is capable of being isolated in less than the DRAIN TIME. AND C.3 Verify one standby gas treatment subsystem is capable of being placed in operation in less than the DRAIN TIME.	 4 hours 4 hours
D. DRAIN TIME < 8 hours.	D.1----------NOTE---------- Required ECCS injection/spray subsystem or additional method of water injection shall be capable of operating without offsite electrical power. --- Initiate action to establish an additional method of water injection with water sources capable of maintaining RPV water level > TAF for ≥ 36 hours. AND D.2 Initiate action to restore secondary containment boundary. AND D.3 Initiate action to isolate each secondary containment penetration flow path or verify it can be manually isolated from the control room. AND D.4 Initiate action to verify one standby gas treatment subsystem is capable of being placed in operation.	 Immediately Immediately Immediately Immediately
E. Required Action and associated Completion Time of Condition C or D not met. OR DRAIN TIME < 1 hour.	E.1 Initiate action to restore DRAIN TIME to ≥ 36 hours.	Immediately

The proposed SRs for TS 3.5.3 are shown below:

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify, for a required ECCS injection/spray subsystem, the:	12 hours

	a. Suppression pool water level is ≥ -3 ft; or b. Condensate storage tank(s) water level is ≥ 7 ft for one tank operation and ≥ 4 ft for two tank operation.	
SR 3.5.2.2	Verify, for the required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	31 days
SR 3.5.2.3	----------NOTE---------- Not required to be met for system vent flow paths opened under administrative control. ---------- Verify, for the required ECCS injection/spray subsystem, each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.2.4	Operate the required ECCS injection/spray subsystem for ≥ 10 minutes.	92 days
SR 3.5.2.5	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify the required ECCS injection/spray subsystem can be manually operated.	24 months
SR 3.5.2.6	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	24 months
SR 3.5.2.7	Verify DRAIN TIME ≥ 36 hours.	12 hours

2.2.4 Deletion of Reference to OPDRVs and other miscellaneous changes

2.2.4.1 Deletion of Reference to OPDRVs

In Reference 1, the licensee proposed to revise existing TS requirements related to "operations with a potential for draining the reactor vessel" or "OPDRVs," with new requirements on RPV WIC that will protect Safety Limit 2.1.1.4. To remain consistent with TSTF-542, all references to the term OPDRVs in the MNGP TSs would be deleted. The TS location of these references are summarized as follows:

MNGP LCO	Location of OPDRVs Reference
3.3.6.1, Primary Containment Isolation Instrumentation	Table 3.3.6.1-1, Footnote (a) is deleted, Condition I (Previously described in Section 2.2.2.3 of this SE)
3.3.6.2, Secondary Containment Isolation Instrumentation	Table 3.3.6.2-1 Footnote (a)
3.3.7.1, Control Room Emergency Filtration System Instrumentation	Table 3.3.7.1-1 Footnote (a)

3.3.8.2, Reactor Protection System (RPS) Electrical Power Monitoring	Applicability, Condition F
3.6.1.3, Primary Containment Isolation Valves (PCIVs)	Applicability, Condition G
3.6.4.1, Secondary Containment	Applicability, Condition C
3.6.4.2, Secondary Containment Isolation Valves (SCIVs)	Applicability, Condition D
3.6.4.3, Standby Gas Treatment (SGT) System	Applicability, Conditions C and E
3.7.4, Control Room Emergency Filtration (CREF) System	Applicability, Conditions D and F
3.7.5, Control Room Ventilation System	Applicability, Conditions D and E
3.8.2, AC [alternating current] Sources – Shutdown	Conditions A and B Existing Required Actions A.2.4 and B.4 are renumbered as A.2.3 and B.3, respectively
3.8.5, DC [direct current] Sources - Shutdown	Condition A Existing Required Actions A.4 is renumbered as A.3
3.8.8, Distribution Systems - Shutdown	Condition A Existing Required Actions A.2.4 and A.2.5 are renumbered as A.2.3 and A.2.4, respectively

2.2.4.2 Other Miscellaneous Changes

The licensee corrected title for LCO 3.5.2 in TS SR 3.8.2.1, Note 2. The proposed changes are shown below.

> SR 3.8.1.8 and SR 3.8.1.12 are not required to be met when associated ECCS subsystem(s) are not required to be OPERABLE per LCO 3.5.2, "RPV Water Inventory Control."

2.2.5 MNGP Plant-Specific TSTF-542 TS Variations

Section 2.2, Attachment 1 of Reference 1, identified several MNGP plant-specific TS variations from TSTF-542, Revision 2 (Reference 4), or the NRC-approved TSTF-542 SE (Reference 5). The licensee states these variations do not affect the applicability of TSTF-542 or the NRC staff's SE. Section 3.5 of this SE includes the staff's evaluation of each of these technical variations.

2.2.5.1 Variation 1, Table 3.3.5.1-1, Core Spray [CS] Pump Discharge Flow – Low (Bypass),

NUREG-1433, Table 3.3.5.1-1, Function 1.d, Core Spray Pump Discharge Flow – Low (Bypass), is not included in the MNGP TSs. As a result, this function was not included in TS 3.3.5.3, RPV WIC, Table 3.3.5.3-1.

2.2.5.2 Variation 2, Table 3.3.5.1-1, Manual Initiation

The MNGP TS, Table 3.3.5.1-1, ECCS Instrumentation, does not include functions for manual initiation of CS and LPCI. Since the TS does not include this feature, proposed Table 3.3.5.3-1 in the LAR does not include manual initiation functions for CS and LPCI. In addition, proposed TS Table 3.3.5.3-1 does not include an SR for a logic system functional test since the SR applies only to the manual initiation function. As an alternative to NUREG-1433 SR 3.5.2.8, which demonstrates ECCS injection/spray actuation on a manual initiation signal, NSPM proposes that TS 3.5.2, "RPV Water Inventory Control," include a new SR 3.5.2.5 to verify the required CS or LPCI subsystem can be manually operated through the manipulation of the subsystem components from the control room.

2.2.5.3 Variation 3, TS Table 3.3.5.3-1, Channel Checks

The LAR states that MNGP design does not provide the capability to perform channel checks for the following functions in existing Table 3.3.5.1-1: Function 1.c, Reactor Steam Dome Pressure - Low (Injection Permissive), Function 2.c, Reactor Steam Dome Pressure – Low (Injection Permissive), and Function 2.g, Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass). Therefore, Channel Checks are not included in Table 3.3.5.3-1 of the LAR for these functions.

In Reference 1, Attachment 1, Section 2.2, "Variation," item h (page 5 of 9), Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass), was incorrectly identified as Function 2.d. This function was corrected in Reference 2 from Function 2.d to Function 2.g.

2.2.5.4 Variation 4, SR 3.5.2.4, Recirculation Line

The LAR states that SR 3.5.2.4 has been modified to remove the phrase "through the recirculation line" to avoid potential confusion with the reactor recirculation lines or the CS and RHR pump minimum flow lines, which are sometimes referred to as "recirculation lines" in plant procedures.

2.2.5.5 Variation 5, Table 3.3.5.1-1, Steam Dome Pressure Permissive-Low (Pump Permissive)

The LAR states that MNGP TS Table 3.3.5.1-1, Functions 1.d and 2.d describe the Reactor Steam Dome Pressure Permissive-Low (Pump Permissive) functions for CS and LPCI. These channels delay CS and LPCI pump starts on a Reactor Vessel Water Level - Low Low signal until reactor steam dome pressure is below the setpoint. This ensures that, prior to starting low pressure ECCS subsystem pumps, the reactor pressure has fallen to a value below these subsystems' maximum design pressure. This function is bypassed during manual operation; therefore, these Modes 4 and 5 functions and their corresponding SR can be removed from the TS because the required ECCS subsystem is proposed to be started by manual operation.

2.2.5.6 Variation 6, Table 3.3.5.1-1, Steam Dome Pressure Permissive- Bypass Timer (Pump Permissive)

The MNGP TS, Table 3.3.5.1-1, Functions 1.e and 2.e, describe Reactor Steam Dome Pressure Permissive bypass time delays for the CS and LPCI pumps. The LAR states that the Bypass Timer channels allow the CS and LPCI pumps to start on a Reactor Vessel Water Level - Low

Low signal after the bypass timer times out, even if the reactor steam dome pressure is above its permissive setpoint. This ensures that starting the pumps of the low pressure ECCS subsystems will occur on a Reactor Vessel Water Level - Low Low signal after an 18-minute time delay.

The LAR states that this time delay is unnecessary for manual operation; therefore, these Mode 4 and 5 functions and their corresponding SRs can be removed from the TS because the required ECCS subsystem is proposed to be started by manual operation.

2.2.5.7 Variation 7, Table 3.3.5.1-1, Core Spray Pump Start-Time Delay Relays

MNGP TS, Table 3.3.5.1-1, Function 1.f, describes the Core Spray Pump Start - Time Delay Relays for the CS pumps. The LAR states that this function is not included in NUREG-1433; however, it is similar to the LPCI Pump Start – Time Delay Relays (Function 2.f). The LAR states that the purpose of the time delay relays is to stagger the start of the CS and LPCI pumps that are in Divisions 1 and 2, thus limiting the starting transients on the 4.16 kV (kilovolt) essential buses. This time delay is unnecessary for manual operation; therefore, this function does not need to be included and can be removed from the TS.

2.2.5.8 Variation 8, Table 3.3.7.1-1, Reactor Building Ventilation Exhaust Radiation

The LAR includes Table 3.3.7.1-1, Function 3, Reactor Building Ventilation Exhaust Radiation – High in lieu of a Control Room Air Inlet Radiation – High function (NUREG 1433, Table 3.3.7.1-1, Function 5). The LAR states that like the Control Room Air Inlet Radiation – High function, this function initiates the CREF System to isolate the control room envelope from untreated outside air. Therefore, the Reactor Building Ventilation Exhaust Radiation – High is the MNGP equivalent function to the Standard Technical Specification (STS) Control Room Air Inlet Radiation – High function and is being revised in a similar manner to how TSTF-542 revises the STS Control Room Air Inlet Radiation – High function.

2.2.5.9 Variation 9, TS 3.3.8.2, RPS Electric Power Monitoring (EPM)

The LAR proposed revising TS, Section 3.3.8.2, RPS EPM, to remove references to OPDRVs from the Applicability of the LCO and from Condition F. The LAR states that this is an MNGP specific section and does not have an equivalent in the STS, however, the justification for removing references to OPDRVs found in the STS applies to this section and the references are being removed.

2.2.5.10 Variation 10, SR 3.5.2.1, ECCS Water Supply (suppression pool and condensate storage tank (CST)

The LAR states that the corresponding NUREG -1433, SRs 3.5.2.2 and 3.5.2.3, are combined into a single SR 3.5.2.1 because the requirements for suppression pool water level and CST levels are applicable to both the CS and LPCI systems (i.e., the CS and LPCI systems both have the capability to draw a suction flow path).

2.3 Applicable Regulatory Requirements and Guidane

The regulation at Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.36(a)(1), requires an applicant for an operating license to include in the application proposed TSs in accordance with the requirements of 10 CFR 50.36. The applicant must also include in the

application, a "summary statement of the bases or reasons for such specifications, other than those covering administrative controls." However, per 10 CFR 50.36(a)(1), these TS bases "shall not become part of the technical specifications."

As required by 10 CFR 50.36(c)(1)(i)(a), TSs will include items in the following categories: Safety limits, limiting safety system settings, and limiting control settings. (i)(A) Safety limits for nuclear reactors are limits upon important process variables that are found to be necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity. If any safety limit is exceeded, the reactor must be shut down. The licensee shall notify the Commission, review the matter, and record the results of the review, including the cause of the condition and the basis for corrective action taken to preclude recurrence. Operation must not be resumed until authorized by the Commission.

As required by 10 CFR 50.36(c)(2)(i), the TSs will include LCOs which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. Per 10 CFR 50.36(c)(2)(i), when an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met.

The regulation 10 CFR 50.36(c)(2)(ii) requires licensees to establish TS LCOs for items meeting one or more of the listed criteria. Specifically, Criterion 4, "A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety," supports the establishment of LCOs for RPV WIC due to insights gained via operating experience.

The regulation 10 CFR 50.36(c)(3) requires TSs to include items in the category of SRs, which are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met.

Pursuant to 10 CFR 50.90, whenever a holder of an operating license desires to amend the license, application for an amendment must be filed with the Commission fully describing the changes desired, and following as far as applicable, the form prescribed for original applications. The technical information to be included in an application for an operating license is governed in particular by 10 CFR 50.34(b).

As described in 10 CFR 50.92(a), in determining whether an amendment to a license will be issued to the applicant, the Commission will be guided by the considerations which govern the issuance of initial licenses to the extent applicable and appropriate. The general considerations that guide the Commission include, as stated in 10 CFR 50.40(a), how the TSs provide reasonable assurance that the health and safety of the public will not be endangered. Also, to issue an operating license, of which TSs are a part, the Commission must make the findings of 10 CFR 50.57, including the 10 CFR 50.57(a)(3)(i) finding that there is reasonable assurance that the activities authorized by the operating license can be conducted without endangering the health and safety of the public.

NUREG-1433, Revision 4 (References 5 and 6), contains the STSs for BWR/4 [General Electric] plants and is part of the regulatory standardization effort, the NRC staff has prepared STSs for each of the light-water reactor nuclear designs.

The NRC staff's guidance for review of TSs is in Chapter 16, "Technical Specifications," of NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants" (SRP), dated March 2010 (Reference 6).

2.3.1 MNGP Applicable Regulatory Design Requirements

Monticello updated safety analysis report (USAR), Appendix E, "Plant Comparative Evaluation with the Proposed Atomic Energy Commission (AEC) 70 Design Criteria," describes the evaluation of the design basis of MNGP with the 70 General Design Criteria for Nuclear Power Plant Construction Permits proposed by the AEC for public comment in July 1967.

The comparative evaluation is made with each of the nine groups of criteria sent out in the July 1967 AEC release. As to each group, there is a statement of Northern States Power Company's current understanding of the intent of the criteria in that group and a discussion of the plant design conformance with the intent of the group of criteria. The following criteria from the MNGP USAR are related to this LAR.

Criterion 9 - Reactor Coolant Pressure Boundary. The reactor coolant pressure boundary (RCPB) shall be designed and constructed so as to have an exceedingly low probability of gross rupture or significant leakage throughout its design lifetime.

Criterion 12 - Instrumentation and Control Systems. Instrumentation and controls shall be provided as required to monitor and maintain variables within prescribed operating ranges.

Criterion 16 - Monitoring Reactor Coolant Pressure Boundary. Means shall be provided for monitoring the RCPB to detect leakage.

Criterion 37 - Engineering Safety Features Bases for Design. The engineered safety features (ESFs) shall be provided in the facility to back up the safety provided by the core design, the RCPB, and their protection systems. As a minimum, such ESFs shall be designed to cope with any size RCPB break up to and including the circumferential rupture of any pipe in that boundary assuming unobstructed discharge from both ends.

Criterion 41 - Engineering Safety Features Performance Capability. The ESFs such as emergency core cooling and containment heat removal systems shall provide sufficient performance capability to accommodate partial loss of installed capacity and still fulfill the required safety function. As a minimum, each ESF shall provide this required safety function assuming a failure of a single active component.

Criterion 44 – Emergency Core Cooling Systems Capability. At least two ECCS systems, preferably of different design principles, each with a capability for accomplishing abundant emergency core cooling, shall be provided. Each ECCS and the core shall be designed to prevent fuel and clad damage that would interfere with the RCPB, including the double-ended rupture of the largest pipe. The performance of each ECCS core cooling system shall be evaluated conservatively in each area of uncertainty. The systems shall not share active components and shall not share other features or components unless it can be demonstrated that; (a) the capability of the shared feature or components to perform its required function can be readily ascertained during reactor operation, (b) failure of the shared feature or component does not initiate a loss-of-coolant accident, and (c) capability of the shared feature or component to perform its required function is not impaired by the effects of a LOCA and is not lost during the entire period this function is required following the accident.

3.0 TECHNICAL EVALUATION

Section 2.2 above lists the proposed TS changes, as included in References 1, 2, and 3, for the licensee to adopt TSTF-542, Revision 2. The following sections summarize the NRC staff's evaluation of each of these proposed changes.

3.1 Staff Evaluation of Proposed "DRAIN TIME" Definition

As discussed in Section 2.2.1 above, the "DRAIN TIME" is the time it would take the RPV water inventory to drain from the current level to the TAF assuming the most limiting of the RPV penetrations flow paths with the largest flow rate, or a combination of penetration flow paths that could open due to a common mode failure, were to open and the licensee took no mitigating action.

The NRC staff reviewed the proposed DRAIN TIME definition from the TSTF-542. For the purpose of staff considerations, the term "break" describes a pathway for water to drain from the RPV that has not been prescribed in the "DRAIN TIME" definition in TSTF-542. Based on the information provided by the licensee, the NRC staff has determined that the licensee is appropriately adopting the principles of DRAIN TIME as described in TSTF-542.

As part of this evaluation, the NRC staff reviewed requests for additional information (RAI) used during the development of TSTF-542, Revision 2, which provided examples of bounding DRAIN TIME calculations for three examples: (1) water level at or below the RPV flange; (2) water level above the RPV flange with fuel pool gates installed; and (3) water level above the RPV flange with fuel pool gates removed. The DRAIN TIME is calculated by taking the water inventory above the break and dividing by the limiting drain rate until the TAF is reached. The limiting drain rate is a variable parameter depending on the break size and the reduction of elevation head above break location during the drain down event. The discharge point will depend on the lowest potential drain point for each RPV penetration flow path on a plant-specific basis. This calculation provides a conservative approach to determining the DRAIN TIME of the RPV.

The NRC staff concludes that the licensee will use methods resulting in conservative calculations to determine DRAIN TIME, thereby, protecting Safety Limit 2.1.1.4 which meets the requirements of 10 CFR 50.36(c)(3). Based on these considerations, the NRC staff has determined that the licensee's proposed addition of the DRAIN TIME definition to the MNGP TSs is acceptable.

3.2 Staff Evaluation of Proposed TS 3.3.5.3, "Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation"

The LAR states that the purpose of the proposed new TS 3.3.5.3 regarding RPV WIC Instrumentation is to support the requirements of revised TS LCO 3.5.2, and the proposed new definition of DRAIN TIME. There are instrumentation and controls and their signal functions that are required for manual pump starts or required as a permissive or operational controls on the equipment of the systems that provide water injection capability, certain start commands, pump protection, and isolation functions. These instruments are required to be operable if the systems that provide water injection and isolation functions are to be considered operable as described in Section 3.3 of this SE for revised TS 3.5.2. For MNGP, reactor operators have alternate means, often requiring several more steps, to start and inject water than the preferred

simple push button start, but can still be accomplished within the time frames assumed in development of TSTF-542. Specifically, the proposed new TS 3.3.5.2 supports operation of the CS and LPCI including manual starts when needed as well as the system isolation of the RHR SDC and RWCU system. The equipment involved with each of these systems is described in the evaluation of TS 3.5.2 below in Section 3.3 and the Bases for LCO 3.5.2. The following sections provide the NRC staff's evaluation of the new TS 3.3.5.3 for RPV WIC Instrumentation.

3.2.1 Staff Evaluation of Proposed TS 3.3.5.3 LCO and Applicability

The LAR proposed a new TS 3.3.5.3 to provide alternative instrumentation requirements to support manual initiation of the ECCS injection/spray subsystem. This subsystem is required in the revised TS 3.5.2 and automatic isolation of penetration flow paths that may be credited in the determination of DRAIN TIME. The current TSs contain instrumentation requirements related to OPDRVs in TS Tables 3.3.5.1-1, 3.3.6.1-1, 3.3.6.2-1, 3.3.7-1, and 3.3.8.2. The requirements from Tables 3.3.5.1-1 and Table 3.3.6.1-1 would be consolidated into new TS 3.3.5.3. The OPDRVs requirements in Tables 3.3.6.2-1, 3.3.7.1-1, and 3.3.8.2 would be deleted, as discussed in Section 3.6 of this SE.

The proposed LCO 3.3.5.3 would state: "The RPV Water Inventory Control Instrumentation for each Function in Table 3.3.5.3-1 shall be OPERABLE."

The proposed Applicability would state: "According to Table 3.3.5.3-1."

The TSTF-542 selected a table to contain those instrumentation functions needed to support manual initiation of the ECCS injection/spray subsystem required by LCO 3.5.2, and for automatic isolation of penetration flow paths that may be credited in a calculation of DRAIN TIME. The functions that are required in Modes 4 or 5, or during OPDRVs, are relocated to Table 3.3.5.3-1 from existing TS 3.3.5.1, "ECCS Instrumentation," and TS 3.3.6.1, "Primary Containment Isolation Instrumentation." Creation of TS 3.3.5.3 places these functions in a single location with requirements appropriate to support the safety function for TS 3.5.2.

As identified in Section 2.2.5.2 above (Variation 2), the MNGP current design-basis does not include a manual initiation logic for the CS or LPCI systems. Therefore, as an alternative, the licensee proposed to add new SR 3.5.2.5 to TS 3.5.2 to verify that CS and LPCI can be manually operated through the manipulation of subsystem components from the main control room.

The NRC staff concludes that the licensee's proposed alternative is acceptable for MNGP since either CS or LPCI (or both) subsystems would be available to perform the intended function to inject water into the RPV; this meets the intent of the NRC approved TSTF-542.

3.2.2 Staff Evaluation of Proposed TS 3.3.5.3 Actions

As discussed in Section 2.2.2.2 above, the NRC staff has reviewed the licensee's proposed new TS 3.3.5.3 "Actions" to determine whether they provide effective remedial measures when one or more instrument channels are inoperable and cannot complete the required function in the normal manner. The "Actions" are evaluated as follows:

> Action A would be applicable when one or more instrument channels are inoperable from Table 3.3.5.3-1 and directs the licensee to immediately enter the condition referenced in Table 3.3.5.3-1 for that channel.

Action B (concerning the SDC system isolation and RWCU system isolation functions) would be applicable when automatic isolation of the associated penetration flow path is credited as a path for potential drainage in calculating DRAIN TIME. If the instrumentation is inoperable, Required Action B.1 directs an immediate declaration that the associated penetration flow path(s) are incapable of automatic isolation. Required Action B.2 requires an immediate recalculation of DRAIN TIME but automatic isolation of the affected penetration flow paths cannot be credited.

Action C (concerning low reactor steam dome pressure permissive functions necessary for ECCS subsystem manual injection valve opening) would address an event in which the permissive is inoperable. The function must be placed in the trip condition within one hour. With the permissive function instrument in the trip condition, manual injection valve opening may now be performed using the preferred control board switches. This 1-hour Completion Time (CT) is acceptable, despite the preferred start method being prevented, the reactor operator can take manual control of the pump and the injection valve to inject water into the RPV and achieve the safety function in that time. The time of 1 hour also provides reasonable time for evaluation and placing the channel in trip.

Action D (concerning LPCI pump discharge flow bypass functions) would address actions when the bypass is inoperable and then there is a risk that the associated ECCS pump could overheat when the pump is operating and the associated injection valve is not fully open. In this condition, the operator can take manual control of the pump and the injection. Similar to the justification for Action C, while this is not the preferred method, the LPCI subsystem pumps can be started manually and the valves can be opened manually. As functions can be performed manually and allows time for the operator to evaluate the necessary repairs, the 24-hour CT is acceptable.

Action E would apply if the Required Actions and associated CTs of Conditions C or D were not met. If they were not met, then the associated low pressure ECCS injection/spray subsystem might be incapable of performing the intended function, and the CS/LPCI subsystem would be declared inoperable immediately.

These "Actions" direct the licensee to take appropriate actions and enter immediately into the conditions referenced in Table 3.3.5.3-1. The NRC staff has determined that these "Actions" satisfy the requirements of 10 CFR 50.36(c)(2)(i) by providing a remedial action permitted by the TSs until the LCO can be met. Therefore, the NRC staff has concluded there is reasonable assurance that the licensee will take appropriate actions during an unexpected drain event to either prevent or to mitigate RPV water level being lowered to the TAF and, therefore, the proposed actions are acceptable.

3.2.3 Staff Evaluation of Proposed TS 3.3.5.3 Surveillances

SR 3.3.5.3.1 would require a Channel Check and applies to system isolation functions in TS Table 3.3.5.3-1 for SDC and RWCU. Performance of the Channel Check would ensure 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 related channels. A Channel Check is significant in assuring that there is a low probability of an undetected complete channel failure and is a key safety practice to verifying the instrumentation continues to operate properly between each Channel Functional Test. The frequency is 12 hours which is

consistent with the existing requirements found in SR 3.3.5.1.1, Channel Check for Modes 1, 2, and 3.

SR 3.3.5.3.2 would require a Channel Functional Test and applies to all functions in TS Table 3.3.5.3-1. A Channel Functional Test is the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify operability of all devices in the channel required for channel operability. It would be performed on each required channel to ensure that the entire channel will perform the intended function. The frequency is 92 days which is consistent with the existing requirements found in SR 3.3.5.1.2, Channel Functional Test for Modes 1, 2, and 3. This is acceptable because it is consistent with the existing requirements for these Functions. In addition, if the licensee so desires, this SR could be included as part of a refueling activity since during refueling outages in periods in Modes 4 and 5 are often 30 days or less.

The TSTF-542 did not include SRs to verify or adjust the instrument setpoint derived from the allowable value using a Channel Calibration, Logic System Functional Test, or a surveillance to calibrate the trip unit. This is because a draining event in Modes 4 or 5 is not an analyzed accident and, therefore, there is no accident analysis on which to base the calculation of a setpoint. The TS Table 3.3.5.3-1 Functions requiring SR 3.3.5.3.2 allow ECCS manual initiation or automatically isolate a penetration flow path; however, no specific RPV water level is assumed for those actions.

Therefore, the allowable value for Mode 3 was chosen for use in Modes 4 and 5 as it will perform the desired function. Calibrating the functions in Modes 4 and 5 is not necessary as TSs 3.3.5.1 and 3.3.6.1 continue to require the Functions to be calibrated on an established interval. Also, a draining event in Modes 4 or 5 is not an analyzed accident and, therefore, there are no assumptions on response times required as part of this LAR. The NRC staff has determined that the Mode 3 allowable value and established calibration intervals are adequate to ensure the channel will respond as required to allow manual initiation of the pumping systems to inject water and automatic isolation of penetration flow paths.

The proposed new TS 3.3.5.3 SRs include Channel Checks and Channel Functional Tests numbered SRs 3.3.5.3.1 and 3.3.5.3.2, respectively. The NRC staff finds that these tests are sufficient and adequate, because they will ensure the functions of TS 3.3.5.3 are operable (i.e., capable of performing the specified safety function in support of TS 3.5.2, DRAIN TIME, and the protection from a potential drain down of the RPV in Modes 4 and 5). The NRC staff finds the proposed SRs of LCO 3.3.5.3 are acceptable and conclude that these SRs satisfy 10 CFR 50.36(c)(3) by providing the specific SRs relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained.

Based on the above, the NRC staff concludes that the proposed SRs of LCO 3.3.5.3 satisfy 10 CFR 50.36(c)(3) by providing the specific SRs relating to test, calibration, or inspection to assure that the necessary operability of systems and components is maintained and are, therefore, acceptable.

3.2.4 Staff Evaluation of Proposed Table 3.3.5.3-1, "RPV Water Inventory Control Instrumentation"

In order to support the requirements of proposed TS 3.5.2, the associated instrumentation requirements are designated in Table 3.3.5.3-1. These instruments would be required to be

operable if the systems that provide water injection and isolation functions were to be considered operable as described in the NRC staff's evaluation of TS 3.5.2 (Section 3.3 below).

Proposed Table 3.3.5.3-1 specifies the instrumentation that shall be operable for each function in Modes 4 and 5 (or other specified conditions), the required number of channels per function, conditions referenced from Required Action A.1, SR for the functions, the allowable value, and footnotes concerning items of the table.

The NRC staff finds this proposed table is acceptable because it sufficiently discusses the purpose of the functions, the applicability, the number of required channels, the references to the Condition to be entered by letter (e.g., B, C, D) if the function is inoperable, the applicable SRs, the selection of the allowable value, and justification of differences between the current and proposed TS functions.

This RPV WIC Instrumentation set is acceptable, because it is adequate so that the instrument channels respond with the required accuracy permitting pump systems to inject water when needed, and activating isolation equipment when commanded to support prevention or mitigation of a potential RPV draining event.

3.2.4.1 Staff Evaluation of Proposed Table 3.3.5.3-1 Functions

For the Table 3.3.5.3-1, Functions 1.a (CS) and 2.a (LPCI), Reactor Steam Dome Pressure - Low (Injection Permissive), the signals would be used as permissives for the low pressure ECCS injection/spray subsystem manual initiation functions. This function would ensure that the reactor pressure has fallen to a value below these subsystems' maximum design pressure before permitting the operator to open the injection valves of the low pressure ECCS subsystems. Even though the reactor steam dome pressure is expected to be below the ECCS maximum design pumping pressure during Modes 4 and 5, the Reactor Pressure - Low signals would be required to be operable and capable of permitting initiation of the ECCS. The proposed allowable value would be ≥ 397 pounds per square inch gauge (psig) and ≤ 440 psig, with two required channels per function as it is currently in MNGP TS, Table 3.3.5.1-1.

For the Table 3.3.5.3-1, Functions 2.b, LPCI system, Pump Discharge Flow - Low (Bypass), these minimum flow instruments were proposed to protect the associated low pressure ECCS pumps from overheating when the pump is operating and the associated injection valve is not fully open. The LPCI minimum flow valves are time delayed such that the valves will not open for 10 seconds after the pump start. This delay can reduce the reactor vessel inventory loss (to the suppression pool) during the startup of the RHR pump while aligned in the SDC mode, since it provides time (prior to opening the minimum flow valve) to manually increase RHR flow above the minimum flow closure setpoint. The proposed required channels per function would be one per pump, as it is currently found in MNGP TS Table 3.3.5.1-1. The proposed allowable values 2.b is ≥ 360 gallons per minute (gpm) and ≤ 745 gpm.

For Table 3.3.5.3-1, Function 3.a, SDC system isolation, Reactor Vessel Water Level - Low, the function would only be required to be operable when automatic isolation of the associated penetration flow path is credited in the DRAIN TIME calculation. The proposed number of required instrument channels is two-in-one trip system. The condition that the RHR system integrity be maintained is a concept related to OPDRVs, so it would not be carried over into TS 3.3.5.3 for RPV WIC Instrumentation. Reactor Vessel Water Level - Low signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in

the vessel. While four channels (two channels per trip system) of the Reactor Vessel Water Level – Low Function are available, only two channels (all in the same trip system) are required to be Operable to ensure automatic isolation of one of the two isolation valves. The allowable value was chosen to be the same as the Primary Containment Isolation Instrumentation Reactor Vessel Water Level - Low, Allowable Value (Function 6.b) from LCO 3.3.6.1, which is ≥ 7 inches.

For Table 3.3.5.3-1, Function 4.a, RWCU system isolation, Reactor Vessel Water Level - Low, Low, the function is only required to be operable when automatic isolation of the associated penetration flow path is credited in the DRAIN TIME calculation. The proposed number of required instrument channels is two-in-one trip system. Reactor Vessel Water Level - Low Low signals are initiated from four differential pressure transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. While four channels (two channels per trip system) of the Reactor Vessel Water Level - Low Low Function are available, only two channels (all in the same trip system) are required to be Operable. This proposed change is a new requirement in Modes 4 and 5 for the RWCU system. However, the instrumentation function is the same as TS Table 3.3.6.1, Function 5.e, which contains the requirements for Modes 1, 2, and 3, with the same allowable value, ≥ - 48 inches.

The NRC staff finds that the proposed new LCO 3.3.5.3 correctly specifies the lowest functional capability or performance levels of equipment required for safe operation of the facility. There is reasonable assurance that the Required Actions to be taken when the LCO is not met are adequate to protect without endangering the health and safety of the public. This meets the requirements of 10 CFR 50.36(c)(2)(i) and, therefore, the staff has determined that the licensee's proposed changes to LCO 3.3.5.3 are acceptable.

3.3 Staff Evaluation of TS 3.5.2 – RPV WIC

The NRC staff reviewed the water sources that would be applicable to the proposed TS 3.5.2.

The proposed LCO 3.5.2 would state, in part:

> "One low pressure ECCS injection/spray subsystem shall be OPERABLE."

'One' low pressure ECCS injection/spray subsystem would consist of either one CS subsystem or one LPCI subsystem. A CS subsystem consists of one motor-driven pump, piping, and valves to transfer water from the suppression pool or one or both CSTs to the RPV. An LPCI subsystem consists of one motor driven pump, piping, and valves to transfer water from the suppression pool or one or both CSTs to the RPV. The ECCS pumps are high-capacity pumps with flow rates of thousands of gpm. Most RPV penetration flow paths would have a drain rate on the order of tens or hundreds of gpm. The manual initiation/start of an ECCS pump would provide the necessary water source to counter these expected drain rates. The LPCI subsystem is to be considered operable during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable. The DHR in Modes 4 and 5 is not affected by the proposed MNGP TS change as these requirements on the number of SDC subsystems that must be operable and in operation to ensure adequate DHR from the core are unchanged. These requirements can be found in the MNGP TS 3.4.8, "Residual Heat Removal (RHR) Shutdown Cooling System - Cold Shutdown," TS 3.9.7, "Residual Heat Removal (RHR) - High Water Level," and TS 3.9.8, "Residual Heat Removal (RHR) - Low Water Level." These MNGP DHR requirements are similar to the STSs and can be found in the

NUREG-1433 TS 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Cold Shutdown," TS 3.9.8, "Residual Heat Removal (RHR) - High Water Level," and TS 3.9.10, "Residual Heat Removal (RHR) - Low Water Level." Based on these considerations, the NRC staff finds that the water sources provide reasonable assurances that the lowest functional capability required for safe operation is maintained and the safety limit is protected.

The proposed TS LCO 3.5.2 contains two parts. The first part states that DRAIN TIME of RPV water inventory to the TAF shall be ≥ 36 hours, and the second part states that one low pressure ECCS injection/spray subsystem shall be OPERABLE. The proposed Applicability for TS 3.5.2 is Modes 4 and 5.

The proposed LCO 3.5.2 note states:

> A Low Pressure Coolant Injection (LPCI) subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable.

The NRC staff reviewed the proposed TS 3.5.2, focusing on ensuring that the fuel remains covered with water and on the changes made compared to the current TS. The proposed TS 3.5.2 contains Conditions A through E based on either required ECCS injection/spray subsystem operability or DRAIN TIME.

The current TS LCO states that two low pressure ECCS injection/spray subsystems shall be operable, whereas, the proposed LCO 3.5.2 states that only one low pressure ECCS injection/spray subsystem shall be operable. This change is reflected in Condition A. The change from two low pressure ECCS injection/spray subsystems to one low pressure ECCS injection/spray subsystem is because this redundancy is not required. With one ECCS injection/spray subsystem and nonsafety-related injection sources, defense-in-depth (DID) will be maintained. The DID measure is consistent with other events considered during shutdown with no additional single failure assumed. The DRAIN TIME controls in addition to the required ECCS injection/spray subsystem, provide reasonable assurance that an unexpected draining event can be prevented or mitigated before the RPV water level would be lowered to the TAF.

The proposed Modes 4 and 5 Applicability of TS 3.5.2 is appropriate given that the TS requirements on ECCS in Modes 1, 2, and 3 will be unaffected.

The proposed Condition A states that if the required ECCS injection/spray subsystem is inoperable it is to be restored to operable status within 4 hours.

The proposed Condition B states that if Condition A is not met, initiate action to establish a method of water injection capable of operating without offsite electrical power immediately. The proposed Condition B provides adequate assurance of an available water source should Condition A not be met within the 4-hour CT.

The proposed Condition C states that for a DRAIN TIME < 36 hours and ≥ 8 hours, to (C.1) verify the secondary containment boundary is capable of being established in less than the DRAIN TIME with a CT of 4 hours, and (C.2) verify each secondary containment penetration flow path is capable of being isolated in less than the DRAIN TIME with a CT of 4 hours, and (C.3) verify one SGT subsystem is capable of being placed in operation in less than the DRAIN TIME with a CT of 4 hours. The proposed Condition C provides adequate protection should the DRAIN TIME be < 36 hours and ≥ 8 hours because of the ability to establish secondary

containment, isolate additional flow paths, and have the SGT subsystem capable of being placed in operations.

The proposed Condition D states that when DRAIN TIME < 8 hours to (D.1) immediately initiate action to establish an additional method of water injection with water sources capable of maintaining RPV water level > TAF for ≥ 36 hours, (D.2) immediately initiate action to restore secondary containment boundary, and (D.3) immediately initiate action to isolate each secondary containment penetration flow path or verify it can be manually isolated from the control room, and (D.4) immediately initiate action to verify one SGT subsystem is capable of being placed in operation. Additionally, there is a note stating that required ECCS injection/spray subsystem or additional method of water injection shall be capable of operating without offsite electrical power which is similar to proposed Condition B. The current MNGP TS for Condition D (Required Action C.2 and associated CT not met) is similar to proposed Condition D. The proposed Condition D provides adequate protection should the DRAIN TIME be < 8 hours because of the requirement for the ability to establish an additional method of water injection (without offsite electrical power), establish secondary containment, isolate additional flow paths, and have the SGT subsystem capable of being placed in operation.

The proposed Condition E states that when the required action and associated CT of Condition C or D is not met, or the DRAIN TIME is < 1 hour, then immediately initiate action to restore DRAIN TIME to ≥ 36 hours. The proposed Condition E is new as it is not present in the current MNGP TS. The proposed Condition E is acceptable as it provides the necessary step to restore DRAIN TIME to ≥ 36 hours should the other conditions not be met or if the DRAIN TIME is < 1 hour.

The NRC staff evaluated the proposed changes to TS 3.5.2 and finds them acceptable based on the actions taken to mitigate the water level reaching the TAF with the water sources available and maintaining DRAIN TIME ≥ 36 hours. The LCO correctly specifies the lowest functional capability or performance levels of equipment required for safe operation of the facility. There is reasonable assurance that the Required Actions to be taken when the LCO is not met can be conducted without endangering the health and safety of the public and, therefore, are acceptable.

3.3.1 Staff Evaluation of Proposed TS 3.5.2 SRs

The proposed TS 3.5.2 SRs (Section 2.2.3 above) includes, verification of water levels/volumes that support ECCS injection/spray subsystems, verification of water filled pipes to preclude water hammer events, verification of correct valves positions for the required ECCS injection/spray subsystem, operation of the ECCS injection/spray systems, verification of valves credited for automatic isolation actuated to the isolation position, verification that the required ECCS injection/spray subsystem can be manually operated, and verification of DRAIN TIME. Each of the seven SRs are described below.

SR 3.5.2.1: The suppression pool water level (≥ - 3 ft) or CSTs water level, ≥ 7 feet for one tank operation and ≥ 4 feet for two tank operation, for a required ECCS injection/spray subsystem is required to be verified to ensure pump net positive suction head and vortex prevention is available for the ECCS injection/spray subsystem required to be operable by the LCO. This surveillance would be required to be performed with a frequency of 12 hours. This frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool or CST water level condition.

SR 3.5.2.2: The SR to verify the ECCS injection/spray subsystem piping is sufficiently filled with water would be retained from the existing TS 3.5.2. The proposed change would update the SR to reflect the change to LCO 3.5.2, which would require, in part, one low pressure ECCS injection/spray subsystem to be operable instead of two. SR 3.5.2.2 wording would change from "Verify, for each required ECCS . . ." to "Verify, for the required ECCS . . ." The change clarifies the requirement to maintain consistency with the proposed LCO. The ECCS injection/spray subsystem flow path piping and components have the potential to develop voids and pockets of entrained gases. Preventing and managing gas intrusion and accumulation is necessary for proper operation of the required ECCS injection/spray subsystem and may also prevent a water hammer, pump cavitation, and pumping of noncondensible gas into the reactor vessel. ECCS injection/spray subsystem locations susceptible to gas accumulation are monitored and, if gas is found, the gas volume is compared to the acceptance criteria for the location. Susceptible locations in the same system flow path which are subject to the same gas intrusion mechanisms may be verified by monitoring a representative sub-set of susceptible locations.

This surveillance would be required to be performed with a frequency of 31 days. This frequency is considered adequate based on the gradual nature of void buildup in the ECCS injection/spray subsystem piping, the procedural controls governing system operation, and operating experience.

SR 3.5.2.3: The SR to verify the correct alignment for manual, power operated, and automatic valves in the required ECCS subsystem flow path would be retained from the existing TS 3.5.2. Similar to the change discussed above for proposed SR 3.5.2.2, changes to SR 3.5.2.3 would clarify a proposed requirement for LCO 3.5.2. The proposed SR wording, "Verify, for the required ECCS injection/spray subsystem each manual . . ." would replace "Verify each required ECCS injection/spray subsystem manual . . ." SR 3.5.2.3 would provide assurance that the proper flow path will be available for ECCS operation to support TS 3.5.2. This surveillance would be required to be performed with a frequency of 31 days. This frequency is appropriate because the valves are operated under procedural control and the probability of their being mispositioned during this time period is low. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned such as check valves.

Existing Note for SR 3.5.2.3 which state; "Not required to be met for system vent flow paths opened under administrative control," is maintained for SR 3.5.2.3.

SR 3.5.2.4: The required ECCS injection/spray subsystem would be required to be operated for ≥ 10 minutes. This surveillance would be required to be performed with a frequency of 92 days. The performance frequency of 92 days is consistent with similar at-power testing required by SR 3.5.1.7. This would demonstrate that the subsystem is capable of operation to support TS 3.5.2. Testing the ECCS injection/spray subsystem through the CS/LPCI minimum flow lines or recirculation line is necessary to avoid overfilling the refueling cavity. The minimum operating time of 10 minutes is based on engineering judgment.

Variation 4 (Section 3.5.4 of this SE) also describes the ECCS operations for ≥ 10 minutes.

SR 3.5.2.5: This SR would state, "Verify the required ECCS injection/spray subsystem can be manually operated." It would demonstrate that the required CS or LPCI subsystem could be manually initiated using the associated pump and valve switches to provide additional RPV

water inventory, if needed. Vessel injection/spray may be excluded from the SR, per the existing note. This surveillance would be required to be performed with a frequency of 24 months. The 24-month frequency is based on the need to perform the surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the SR when performed at the 24 month frequency, which is based on the refueling cycle.

SR 3.5.2.6: Verification that each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal would be required to prevent RPV water inventory from dropping below the TAF should an unexpected draining event occur. This surveillance would be required to be performed with a frequency of 24 months which is based on the need to perform this surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power.

SR 3.5.2.7: The DRAIN TIME would be determined or calculated, and required to be verified to be ≥ 36 hours. This surveillance would be required to be performed with a frequency of 12 hours. This frequency is based on indications of RPV water level available to the operator. This surveillance would verify that the LCO for DRAIN TIME is met. Numerous indications of changes in RPV level are available to the operator. The period of 36 hours is considered reasonable to identify and initiate action to mitigate draining of reactor coolant (normally 3 operator shifts). Changes in RPV level would necessitate recalculation of the DRAIN TIME.

The NRC staff evaluated each of these proposed SRs associated with the proposed LCO 3.5.2 and concluded that they are appropriate for ensuring the operability of the equipment and instrumentation specified in LCO 3.5.2. The staff concluded that each of the proposed SRs are acceptable since they meet the requirements of 10 CFR 50.36(c)(2)(ii) regarding insights gained via operating experience and 10 CFR 50.36(c)(3) for SRs by ensuring that the necessary quality of systems and components are maintained.

3.4 Staff Evaluation of TS Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation"

The TS LCO 3.3.5.1 currently states that, "the ECCS instrumentation for each function in Table 3.3.5.1-1 shall be OPERABLE" and the applicability of the action statements are identified in the table. Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation," currently contains requirements for function operability during Modes 4 and 5 when the associated ECCS subsystem(s) are required to be operable. Changes to conform the MNGP TS to TSTF-542 were proposed for the actions table of LCO 3.3.5.1 as well.

For the following functions in Table 3.3.5.1-1, Modes 4 and 5 requirements would be either completely deleted or relocated to proposed Table 3.3.5.2-1:

FUNCTION	FUNCTIONS COMPLETELY DELETED	FUNCTION RELOCATED TO TABLE 3.3.5.3-1
1. Core Spray System		
(a) Reactor Vessel Water Level - Low Low	Yes	
(c) Reactor Steam Dome Pressure - Low (Injection Permissive)	No	Function 1.a
(d) Reactor Steam Dome Pressure Permissive - Low (Pump Permissive)	Yes	
(e) Reactor Steam Dome Pressure Permissive - Bypass Timer (Pump Permissive)	Yes	
(f) Core Spray Pump Start - Time Delay Relay	Yes	
2. Low Pressure Coolant Injection (LPCI) System		
(a) Reactor Vessel Water Level - Low Low	Yes	
(c) Reactor Steam Dome Pressure - Low (Injection Permissive)	No	Function 2.a
(d) Reactor Steam Dome Pressure Permissive - Low (Pump Permissive)	Yes	
(e) Reactor Steam Dome Pressure Permissive - Bypass Timer (Pump Permissive)	Yes	
(f) Low Pressure Coolant Injection Pump Start - Time Delay Relay	Yes	
(g) Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	No	Function 2.b

The requirements for Functions 1.c, 2.c, and 2.g would be moved to proposed TS Table 3.3.5.3-1 as discussed in Section 3.2.4.1 of this SE.

For TS Table 3.3.5.1-1 Functions 1.a, 1.d, 1.e, 1.f, 2.a, 2.d, 2.e, and 2.f, the Modes 4 and 5 requirements would not be retained. The MNGP TS currently requires automatic initiation of ECCS pumps on low reactor vessel water level. However, in Modes 4 and 5, automatic initiation of ECCS pumps could result in overfilling the refueling cavity or water flowing into the main steam lines, potentially damaging plant equipment.

The NRC staff finds acceptable the deletion of TS Table 3.3.5.1-1, Functions 1.a, and 2.a, because manual ECCS initiation is preferred over automatic initiation during Modes 4 and 5, and the operator would be able to use the most appropriately sized pumps if needed to mitigate a draining event.

The deletion of Functions 1.d and 2.d are described under Variation 5, (Section 3.5.5 of this SE), and the deletion of Functions 1.e and 2.e are described under Variation 6, (Section 3.5.6 of this SE).

The NRC staff finds acceptable that the deletion of Functions 1.f and 2.f, CS/LPCI pump start-time delay relay low reactor steam dome, bypass time channels. The Bypass Timer channels allow the CS and LPCI pumps to start on Reactor Vessel Water Level - Low Low after the time delay times out, even if the reactor steam dome pressure is above its permissive setpoint. NRC staff finds the deletion of the two Bypass Timer permissive functions consistent with TSTF-542 since they are no longer needed in Modes 4 and 5. These functions do not have an equivalent described in the STS. The purpose of these time delays is to provide sufficient time for the operator to inhibit any unnecessary automated data system actuation. The deletion of Function 1.f is further described under Variation 7, (Section 3.5.7 of this SE).

3.5 Staff Evaluation of Proposed Technical Variations

The licensee proposed the following technical variations from the TS changes described in TSTF-542 or the applicable parts of the NRC staff's SE for TSTF-542. The licensee stated in the LAR that these variations do not affect the applicability of TSTF-542 or the NRC staff's SE for TSTF-542 to the proposed license amendment. The NRC staff evaluated each variation below.

3.5.1 Variation 1, Table 3.3.5.1-1, Core Spray Pump Discharge Flow – Low (Bypass)

NUREG-1433, Table 3.3.5.1-1, Function 1.d, Core Spray Pump Discharge Flow – Low (Bypass), is not included in the MNGP TSs. As a result, this function is not being included in TS 3.3.5.3, RPV WIC, Table 3.3.5.3-1.

In Reference 2, the licensee stated that each MNGP CS subsystem is equipped with a minimum flow bypass line that contains a restricting orifice and locked open manual isolation valve to ensure the pump will not overheat when the associated injection valve is not fully open. The minimum flow line contains no instrumentation or active components and continuously diverts a portion of the core spray pump discharge back to the drywell suppression pool regardless of reactor system pressure or position of the injection valve.

The NRC staff has determined that the above CS Function 1.d, Table 3.3.5.1-1, noted in STS, is not a function in the MNGP TS and is not included as part of the proposed TS changes the support TSTF-542. NRC staff reviewed the RAI response (Reference 2) which indicates there is adequate protection from pump overheating via the installed minimum flow bypass line that does not require instrumentation or active components; therefore, the NRC staff finds Variation 1 acceptable.

3.5.2 Variation 2, Table 3.3.5.1-1, Manual Initiation

The MNGP TS, Table 3.3.5.1-1, ECCS system instrumentation, does not include functions for manual initiation of CS and LPCI. Since the TS does not include this feature, proposed Table 3.3.5.3-1 does not include manual initiation functions for CS and LPCI. In addition, TS Table 3.3.5.3-1 does not include a SR for a logic system functional test since it applies only to the manual initiation function.

As an alternative to NUREG-1433, SR 3.5.2.8, which demonstrates ECCS injection/spray actuation on a manual initiation signal, the licensee proposes that TS 3.5.2, RPV WIC, include a new SR 3.5.2.5 to verify the required CS or LPCI subsystem can be manually operated through the manipulation of the subsystem components from the control room. This alternative is justified by the fact that a draining event is a slow evolution when compared to a design basis

LOCA, which is assumed to occur at full power, and thus there is adequate time to take manual actions (i.e., hours versus minutes). Adequate time to take action is assured since the proposed TS 3.5.2, Condition E, prohibits plant conditions that result in DRAIN TIMEs that are less than 1 hour. Therefore, there is sufficient time for the licensed operators to take manual action to stop an unanticipated draining event, and to manually start an ECCS injection/spray subsystem or the additional method of water injection.

The NRC staff reviewed the licensee proposed alternative and determined that although MNGP does not have the capability to start an ECCS subsystem with a single push button, the components that provide ECCS injection/spray into the RPV can be started, within sufficient time, from the main control room as required to support Modes 4 and 5 operations. The manipulation of low pressure ECCS subsystem components from the main control room would be verified in accordance with new SR 3.5.2.5. This SR verifies that the required CS or LPCI subsystem (including associated pump switches, and valves) can be manually operated to provide additional RPV water inventory, if needed. Therefore, the NRC staff finds Variation 2 acceptable.

3.5.3 Variation 3, TS Table 3.3.5.3-1, Channel Checks

The MNGP design does not provide the capability to perform Channel Checks for the following functions in existing Table 3.3.5.1-1: Function 1.c, Reactor Steam Dome Pressure - Low (Injection Permissive), Function 2.c, Reactor Steam Dome Pressure – Low (Injection Permissive), and Function 2.g, Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass). Therefore, Channel Checks are not included in Table 3.3.5.3-1 for these functions.

In Reference 1, Attachment 1, Section 2.2, "Variation," item h (page 5 of 9), Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass), was incorrectly identified as Function 2.d. This function was corrected in Reference 2 from Function 2.d to Function 2.g.

The NRC staff has determined that the above instrument functions do not have existing Channel Checks (existing TS Table 3.3.5.1-1, SR 3.3.5.1.1), and no future Channel Checks were proposed for any instruments being relocated to new TS Table 3.3.5.3-1 related to CS or LPCI steam dome pressure or LPCI pump discharge flow-low. Channel Checks are proposed only for reactor vessel water level-low for the RHR and RWCU systems. Since Channel Checks for these functions have no impact on manual ECCS injection/spray capabilities for CS or LPC, the licensee will retain its current licensing basis for these instruments. Therefore, the NRC staff finds Variation 3 acceptable.

3.5.4 Variation 4, SR 3.5.2.4, Recirculation Line

The SR 3.5.2.4 has been modified to remove the phrase "through the recirculation line" to avoid potential confusion with the reactor recirculation lines or the CS and RHR pump minimum flow lines which are sometimes referred to as "recirculation lines" in plant procedures.

The NRC staff has determined that the deletion of the phrase "through the recirculation line" is acceptable since the intent of this SR was to verify pump CS/LPCI flow is available to mitigate a drain down event. For example, flow verification can be performed through the recirculation line and/or minimum flow lines to the suppression loop to avoid overfilling the reactor cavity. Therefore, the NRC staff finds Variation 4 acceptable.

3.5.5 Variation 5, Table 3.3.5.1-1, Steam Dome Pressure Permissive-Low (Pump Permissive)

The MNGP TS Table 3.3.5.1-1 Functions 1.d and 2.d, describe the Reactor Steam Dome Pressure Permissive-Low (Pump Permissive) functions for CS and LPCI. These channels delay CS and LPCI pump starts on a Reactor Vessel Water Level - Low Low signal until reactor steam dome pressure is below the setpoint defined in operating procedures. This ensures that, prior to starting low pressure ECCS subsystem pumps, the reactor pressure has fallen to a value below these subsystems' maximum design pressure.

The NRC finds that this CS and LPCI steam dome pressure low pump permissive logic is unnecessary giving the new requirements set forth in TSTF-542. This function is bypassed during manual operation; therefore, since the ECCS systems will be manually operated in Modes 4 and 5, these functions and their corresponding SRs can be deleted. Consequently, there is no need for Modes 4 and 5 steam dome pressure low pump permissive logic of CS and LCPI to be operable and to respond to an unexpected draining event. A draining event is a slow evolution when compared to a design basis LOCA assumed to occur at a significant power level. Therefore, the NRC staff finds Variation 5 acceptable.

3.5.6 Variation 6, Table 3.3.5.1-1, Steam Dome Pressure Permissive- Bypass Timer (Pump Permissive)

The MNGP TS Table 3.3.5.1-1 Functions 1.e and 2.e, describe Reactor Steam Dome Pressure Permissive bypass time delays for the CS and LPCI pumps. The bypass timer channels allow the CS and LPCI pumps to start on a Reactor Vessel Water Level - Low Low signal after the bypass timer times out, even if the reactor steam dome pressure is above its permissive setpoint.

The NRC finds that the steam dome pressure permissive bypass time delay logic for the CS and LPCI pumps is unnecessary giving the new requirements set forth in TSTF-542. This logic ensures that starting the pumps of the low pressure ECCS subsystems will occur on a Reactor Vessel Water Level - Low Low signal after an 18-minute time delay. This time delay is unnecessary for manual operation since they will be loaded sequentially via operating procedures; therefore, these Modes 4 and 5 functions and their corresponding SRs can be removed from the TS. Thus, the NRC staff finds Variation 6 acceptable.

3.5.7 Variation 7, Table 3.3.5.1-1, Core Spray Pump Start-Time Delay Relays

The MNGP TS Table 3.3.5.1-1 Function 1.f, describes the Core Spray Pump Start - Time Delay Relays for the Core Spray pumps. This function is not included in NUREG-1433; however, it is similar to the LPCI Pump Start – Time Delay Relays (STS Table 3.3.5.1-1, Function 2.f), which is deleted in TSTF-542.

The NRC finds that the CS pump start time delay relay logic is unnecessary given the new requirements set forth in TSTF-542. The purpose of the time delay relays is to stagger the start of the CS and LPCI pumps that are in Divisions 1 and 2, thus limiting the starting transients on the 4.16 kV essential buses. This time delay is unnecessary for manual operation and the function can be removed from the TS. Therefore, the NRC staff finds Variation 7 acceptable.

3.5.8 Variation 8, Table 3.3.7.1-1, Reactor Building Ventilation Exhaust Radiation

The MNGP TS includes Table 3.3.7.1-1, Function 3, Reactor Building Ventilation Exhaust Radiation - High in lieu of a Control Room Air Inlet Radiation - High function (NUREG 1433, Table 3.3.7.1-1, Function 5). Like the Control Room Air Inlet Radiation - High function, this function initiates the CREF system to isolate the control room envelope from untreated outside air. Therefore, the Reactor Building Ventilation Exhaust Radiation – High is the MNGP equivalent function to the STS Control Room Air Inlet Radiation – High function and is being revised in a similar manner to how TSTF-542 revises the STS Control Room Air Inlet Radiation – High function.

The NRC staff finds the STS and the MNGP Licensing Bases are slightly different in terminology as it relates to the ventilation systems that isolate the control rooms (CREF) from outside air; however, they are equivalent functions in terms of operation. These actions are required to mitigate the consequences of the LOCA or fuel handling accident involving recently irradiated fuel by limiting the control room doses to less than the limits calculated in the safety analysis. Therefore, the NRC staff finds Variation 8 acceptable.

3.5.9 Variation 9, TS 3.3.8.2, Reactor Protection System (RPS) Electric Power Monitoring

The MNGP TS Section 3.3.8.2 RPS EPM is being revised to remove references to OPDRVs from the Applicability of the LCO and from Condition F.

The NRC staff finds MNGP TS, Section 3.3.8.2, RPS EPM, is an MNGP specific section and does not have an equivalent in the STS; however, the justification for removing references to OPDRVs found in the STS applies to this section and the references are being removed. Presently, TS LCO 3.3.8.2 requires that two RPS EPM assemblies shall be OPERABLE for each inservice RPS motor generator set or alternate power supply during OPDRVs. Removal of these references to OPDRVs are consistent with the justification found in TSTF-542; therefore, the NRC staff finds Variation 9 acceptable.

3.5.10 Variation 10, SR 3.5.2.1, ECCS Water Supply (Suppression Pool and CST)

In the MNGP TS, the corresponding NUREG-1433 SRs 3.5.2.2 and 3.5.2.3, are combined into a single SR 3.5.2.1 because the requirements for suppression pool water and CST levels are applicable to both the CS and LPCI systems.

The NRC staff finds the STS and the MNGP licensing bases are different as it relates to ECCS water supplies. Presently, TS SR 3.5.2.2, has both suppression pool and two CSTs as ECCS water supplies for both CS and RHR and LPC combined; therefore, the NRC staff finds Variation 10 acceptable.

3.6 Staff Evaluation of Proposed Deletion of References to OPDRVs and Other Miscellaneous Changes

Section 2.2.4.1 above, lists the numerous OPDRVs references proposed for deletion. The proposed changes would replace the existing specifications related to OPDRVs with revised specifications for RPV WIC. For example, the proposed change removes; "operations with a potential for draining the reactor vessel," the acronym "OPDRVs," "during operations with a potential for draining the reactor vessel," and Required Actions to "suspend OPDRVs." For TS

3.6.1.3, "When associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation," is also proposed to be deleted.

The term OPDRVs is not specifically defined in the TSs and historically has been subject to inconsistent application by licensees. The changes discussed in this SE are intended to resolve any ambiguity by creating a new RPV WIC TS with equipment operability requirements, required actions, and SRs and deleting references to OPDRVs throughout the TS. The existing MNGP TSs contain instrumentation requirements related to OPDRVs in four TS; three of them, which have references to OPDRVs, and TS 3.3.5.1. The proposed TS 3.3.5.3 consolidates the RPV WIC instrumentation requirements into a single location to simplify the presentation and provides requirements consistent with TS 3.5.2. The remaining TSs with OPDRVs requirements are for primary and secondary containment, primary and secondary containment isolation valves, RPS electrical power monitoring, SGT, control room emergency filtration system, control room ventilation system, and electrical sources. Each of these systems' requirements during OPDRVs were proposed for consolidation into revised TS 3.5.2 for RPV WIC based on the appropriate plant conditions and calculated DRAIN TIME.

Section 2.2.4.2 describes that the licensee corrected title for LCO 3.5.2 in TS SR 3.8.2.1, Note 2. The proposed changes are shown below.

> SR 3.8.1.8 and SR 3.8.1.12 are not required to be met when associated ECCS subsystem(s) are not required to be OPERABLE per LCO 3.5.2, "RPV Water Inventory Control."

The NRC staff has determined that the deletion of OPDRVs references, Modes 4 and 5 references in TS 3.6.1.3, along with the corresponding editorial changes and title changes are appropriate because the proposed TSs governing RPV WIC and the associated instrumentation, TSs 3.5.2 and 3.3.5.3, respectively, are simplified alternative set of controls for ensuring water level is maintained above the TAF and, therefore, these changes are acceptable.

3.7 Staff Evaluation of TS 3.10, Special Operations and TSTF 484

The current MNGP TS LCO 3.10.1, "Inservice Leak and Hydrostatic Testing Operations," allows performance of an inservice leak or hydrostatic test with the average reactor coolant temperature greater than 212 °F, while considering operational conditions to still be in Mode 4, provided certain secondary containment LCOs are met.

The TSTF-484, Revision 0, "Use of TS 3.10.1 for Scram Time Testing Activities," revised STS LCO 3.10.1 to expand its scope to include operations where temperature exceeds 200 °F: (1) as a consequence of maintaining adequate reactor pressure for an inservice leak or hydrostatic test, or (2) as a consequence of maintaining adequate reactor pressure for control rod scram time testing initiated in conjunction with an inservice leak or hydrostatic test.

By Amendment No. 174, dated August 9, 2013, the NRC approved changes to MNGP TS LCO 3.10.1, in accordance with TSTF-484 (Reference 7). The NRC staff's SE for this amendment stated, in part, that, "two low-pressure emergency core cooling systems (ECCS) injected/spray subsystems are required to be operable in Mode 4 by TS 3.5.2, 'ECCS-Shutdown.'" However, per the proposed new LCO 3.5.2, which would replace the requirements of LCO 3.5.2 only one low pressure ECCS injection/spray subsystem would be required to be operable in Mode 4.

The NRC staff determined that changing from two ECCS injection/spray subsystems to one ECCS injection/spray subsystem is acceptable because, as stated previously in Section 3.3 of this SE, this level of redundancy is not required even during application of LCO 3.10.1. When the licensee applies LCO 3.10.1 at the end of a refueling outage, an exceptionally large volume of water is present in the reactor vessel since the vessel is nearly water solid. There is much more water in the reactor vessel present during power operation. Small leaks from the reactor coolant system would be detected by inspections before a significant loss of inventory occurred. In the event of a large reactor coolant system leak, the RPV would rapidly depressurize and allow operation of the low pressure ECCS. At low decay heat values and near Mode 4 conditions, the stored energy in the reactor core will be very low. Therefore, the reasoning that operators would have time to respond with manual actions to start any ECCS pumps and properly align valves for injection from the control room remains valid.

As stated previously in Section 3.3 of this SE, with one ECCS injection/spray subsystem and nonsafety-related injection sources, defense-in-depth will be maintained. The DID measure is consistent with other events considered during shutdown with no additional single failure assumed. The DRAIN TIME controls, in addition to the required ECCS injection/spray subsystem, provide reasonable assurance that an unexpected draining event can be prevented or mitigated before the RPV water level would be lowered to the TAF.

After considering of the reasoning presented in this SE and reviewing Reference 6, the NRC staff determined that the LCOs 3.3.5.3 and 3.5.2 adopted as part of TSTF-542 are satisfactory and will, therefore, be acceptable even during application of LCO 3.10.1.

3.8 Technical Conclusion

The MNGP Safety Limit 2.1.1.4 requires that reactor vessel water level shall be greater than the top of active irradiated fuel. Maintaining water level above the TAF ensures that the fuel cladding fission product barrier is protected during shutdown conditions. The proposed changes to the TSs establish new LCO requirements that address the preventive and mitigative equipment and associated instrumentation that provide an alternative means to support Safety Limit 2.1.1.4 during Modes 4 and 5 operations.

The reactor coolant system is at a low operating temperature (< 212 °F) and is depressurized during Modes 4 and 5 conditions. An event involving a loss of inventory while in the shutdown condition does not exceed the capacity of one ECCS subsystem. The accident that is postulated to occur during shutdown conditions, the Fuel Handling Accident (USAR, Section 14.7.6, Refueling Accident Analysis) does not involve a loss of inventory. Therefore, the equipment and instrumentation associated with the Reactor Vessel WIC TS do not provide detection or mitigation related to these design basis accidents.

The proposed TS LCO 3.5.2 contains requirements for operability of one ECCS subsystem, along with requirements to maintain a sufficiently long DRAIN TIME so that plant operators would have time to diagnose and mitigate an unplanned draining event. The NRC staff has determined that the LCOs 3.5.2 and 3.3.5.3 provide for the lowest functional capability or performance levels of equipment required for safe operation of the facility and, therefore, meet the LCO requirements of 10 CFR 50.36(c)(2)(i).

Additionally, the revised TS LCOs 3.5.2 and 3.3.5.3 provide remedial actions to be taken in the event the LCO is not satisfied and, therefore, meet the requirements of 10 CFR 50.36(c)(2)(i).

The NRC staff finds that the proposed action statements provide reasonable assurance that an unexpected draining event can be prevented or mitigated before the RPV water level would be lowered to the TAF.

The NRC staff evaluated the proposed DRAIN TIME definition, TS 3.5.2, which contains the requirements for RPV WIC, and TS 3.3.5.3, which contains the requirements for instrumentation necessary to support TS 3.5.2. Based on the considerations discussed above, the NRC staff concludes that the proposed revisions are acceptable because they consolidate and clarify the RPV WIC requirements that meet 10 CFR 50.36(c)(2)(ii), Criterion 4, to establish LCOs for structures, systems, or components significant to public health and safety as evidenced by operating experience.

The licensee proposed to delete OPDRV references from the TS Applicability descriptions, Conditions, Required Actions, and Footnotes. The NRC staff reviewed the proposed changes and determined that the deletion of OPDRVs references along with the corresponding editorial changes, are appropriate because the proposed TSs governing RPV WIC and the associated instrumentation, TSs 3.5.2 and 3.3.5.3, respectively, are a clarified and simplified alternative set of controls for ensuring that water level is maintained above the TAF.

The NRC staff reviewed the SRs associated with the new LCOs 3.5.2 and 3.3.5.3. The staff finds that the proposed TS SRs in TS 3.5.2 are acceptable since they support TS 3.5.2 DRAIN TIME requirements, assure that water inventory is available for ECCS injection/spray subsystem RPV injection and pump performance, ECCS injection/spray subsystems are adequately filled (mitigates effects of gas accumulation or voiding), the subsystems have verified valve positions to support RPV injection, verified pumps provide adequate flow to support DRAIN TIME and RPV injection, verification of automatic isolation, and ECCS injection/spray subsystems can be manually operated to inject. The staff finds that the two SRs proposed for TS 3.3.5.3 are sufficient and adequate because they ensure that the functions are capable of performing their specified safety functions in support of TS 3.5.2, DRAIN TIME and the protection from a potential drain down of the RPV in Modes 4 and 5. Therefore, the NRC staff concludes that the proposed SRs satisfy 10 CFR 50.36(c)(3).

The NRC staff evaluated the proposed MNGP changes against each of the unit applicable design requirements listed in Section 2.3.1 of this SE. The NRC staff finds that the proposed changes for Mode 4 and 5 operations, as they relate to the proposed TS changes for the new DRAIN TIME definition and the removal of OPDRV references, remain consistent with the plant design criteria in that the design requirements for instrumentation, reactor coolant leakage detection, the RCPB, and reactor coolant makeup are unaffected.

The regulation at 10 CFR 50.36(a)(1) states that a summary statement of the bases or reasons for such specifications, other than those covering administrative controls, shall also be included in the application but shall not become part of the TSs. In accordance with this requirement, the licensee provided TS Bases changes in the proposed LAR (Reference 1). The NRC staff concludes that the TS Bases changes provided describe the basis for the affected TS and follow the Final Policy Statement on TSs Improvements for Nuclear Power Reactors (58 FR 39132).

Additionally, the proposed TS changes were reviewed for technical clarity and consistency with the existing MNGP requirements for customary terminology and formatting. The NRC staff found that the proposed changes were consistent with TSTF-542 and Chapter 16 of the SRP.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Minnesota State official was notified of the proposed issuance of the amendment on September 4, 2018. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or change the surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (82 FR 60228). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

7.0 REFERENCES

1 Letter dated October 20, 2017, from Northern States Power Company, Xcel Energy, to U.S. NRC, Monticello Nuclear Generating Plant, Application to Revise Technical Specifications to Adopt TSTF-542, "Reactor Pressure Vessel Water Inventory Control," ADAMS Accession No. ML17293A280.

2 Letter dated June 1, 2018, from Northern States Power Company, Xcel Energy, to U.S. NRC, Monticello Nuclear Generating Plant, Response to Request for Additional Information Regarding Application to Revise Technical Specifications to Adopt TSTF-542, "Reactor Pressure Vessel Water Inventory Control," ADAMS Accession No. ML18157A056.

3 Letter dated September 11, 2018, from Northern States Power Company, Xcel Energy, to U.S. NRC, Monticello Nuclear Generating Plant, Supplement to License Amendment Request to Revise Technical Specifications to Adopt TSTF-542, "Reactor Pressure Water Inventory Control" (EPID: L-2017-LLA-0360), ADAMS Accession No. ML18254A046.

4 Enclosure to Technical Specifications Task Force Traveler TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control," dated March 14, 2016, ADAMS Accession No. ML16074A448.

5 Letter dated December 20, 2016, from U.S. NRC to Technical Specifications Task Force, Final Safety Evaluation of Technical Specifications Task Force Traveler TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control," (TAC No. MF3487), ADAMS Accession No. ML16343B008.

6 NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants" (SRP), Section 16, "*Technical Specifications,*" dated March 2010, ADAMS Accession No. ML100351425.

7 Letter dated August 9, 2013, from US NRC to Northern States Power Company – Minnesota, Monticello Nuclear Generating Plant – Issuance of Amendment No.174 to Adopt TSTF 484, Revision 0, "Use of TS 3.10.1 for Scram Time Testing Activities (TAC No. MF0362)," ADAMS Accession No. ML13168A219.

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ADAMS Accession No.: ML18250A075 *Via memo **via e-mail

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