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

March 28, 2018

Mr. Bryan C. Hanson
Senior Vice President
Exelon Generation Company, LLC
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: NINE MILE POINT NUCLEAR STATION, UNIT 2 – ISSUANCE OF AMENDMENT NO. 168 TO REVISE TECHNICAL SPECIFICATIONS TO ADOPT TECHNICAL SPECIFICATIONS TASK FORCE TRAVELER TSTF-542, REVISION 2, "REACTOR PRESSURE VESSEL WATER INVENTORY CONTROL" (CAC NO. MF9357, EPID L-2017-LLA-0178)

Dear Mr. Hanson:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 168 to Renewed Facility Operating License No. NPF-69 for the Nine Mile Point Nuclear Station, Unit 2 (Nine Mile Point 2). The amendment is in response to your application dated February 28, 2017, as supplemented by letters dated November 3, December 27, 2017, January 12, and February 6, 2018.

The amendment revises existing Nine Mile Point 2 Technical Specification (TS) requirements related to "operations with a potential for draining the reactor vessel" with new requirements on reactor pressure vessel water inventory control to protect TS Safety Limit 2.1.1.3 which requires reactor vessel water level to be greater than the top of active irradiated fuel. The changes are based on TS Task Force (TSTF) Traveler TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control."

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

Sincerely,

Michael L. Marshall, Jr., Senior Project Manager
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-410

Enclosures:
1. Amendment No. 168 to NPF-69
2. Safety Evaluation

cc w/enclosures: Listserv

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

NINE MILE POINT NUCLEAR STATION, LLC

LONG ISLAND LIGHTING COMPANY

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-410

NINE MILE POINT NUCLEAR STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 168
Renewed License No. NPF-69

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

   A. The application for amendment by Exelon Generation Company, LLC (Exelon, the licensee) dated February 28, 2017, as supplemented by letters dated November 3, 2017, December 27, 2017, January 12, 2018, and February 6, 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.

1. 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. NPF-69 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, as revised through Amendment No. 168, are hereby incorporated into this license. Exelon Generation shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

2. This license amendment is effective as of the date of its issuance and shall be implemented no later than the start of the Nine Mile Point Nuclear Station, Unit 2, spring 2018, refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

James G. Danna, Chief
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License No. NPF-69
and Technical Specifications

Date of Issuance: March 28, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 168

NINE MILE POINT NUCLEAR STATION, UNIT 2

RENEWED FACILITY OPERATING LICENSE NO. NPF-69

DOCKET NO. 50-410

Replace the following page of the Renewed Facility Operating License with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove Page	Insert Page
4	4

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 Pages	Insert Pages
i	i
ii	ii
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	1.1-7
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Remove Pages	Insert Pages
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(1) Maximum Power Level

Exelon Generation is authorized to operate the facility at reactor core power levels not in excess of 3988 megawatts thermal (100 percent rated power) in accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, as revised through Amendment No. 168, are hereby incorporated into this license. Exelon Generation shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Fuel Storage and Handling (Section 9.1.SSER 4)*

a. Fuel assemblies, when stored in their shipping containers, shall be stacked no more than three containers high.

b. When not in the reactor vessel, no more than three fuel assemblies shall be allowed outside of their shipping containers or storage racks in the New Fuel Vault or Spent Fuel Storage Facility.

c. The above three fuel assemblies shall maintain a minimum edge-to-edge spacing of twelve (12) inches from the shipping container array and approved storage rack locations.

d. The New Fuel Storage Vault shall have no more than ten fresh fuel assemblies uncovered at any one time.

(4) Turbine System Maintenance Program (Section 3.5.1.3.10 SER)

The operating licensee shall submit for NRC approval by October 31, 1989, a turbine system maintenance program based on the manufacturer's calculations of missile generation probabilities. (Submitted by NMPC letter dated October 30, 1989 from C.D. Terry and approved by NRC letter dated March 16, 1990 from Robert Martin to Mr. Lawrence Burkhardt, III).

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* The parenthetical notation following the title of many license conditions denotes the section of the Safety Evaluation Report (SER) and/or its supplements wherein the license condition is discussed.

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(continued)

1.1 Definitions (continued)

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 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.

(continued)

1.1 Definitions (continued)

EMERGENCY CORE COOLING SYSTEM (ECCS) RESPONSE TIME	The ECCS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ECCS initiation setpoint at the channel sensor until the ECCS equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. 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.
END OF CYCLE RECIRCULATION PUMP TRIP (EOC-RPT) SYSTEM RESPONSE TIME	The EOC-RPT SYSTEM RESPONSE TIME shall be that time interval from initial movement of the associated turbine stop valves or turbine control valves to complete suppression of the electric arc between the fully open contacts of the recirculation pump circuit breaker. 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.
INSERVICE TESTING PROGRAM	The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f).
ISOLATION SYSTEM RESPONSE TIME	The ISOLATION SYSTEM RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its isolation initiation setpoint at the channel sensor until the isolation valves travel to their required positions. 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.
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

(continued)

1.1 Definitions

LEAKAGE (continued)	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; and c. 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 required logic components (i.e., all required relays and contacts, trip units, solid state logic elements, etc.) 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.
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.

(continued)

1.1 Definitions (continued)

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).
PHYSICS TESTS	PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation. These tests are: a. Described in Chapter 14, Initial Test Program of the FSAR; b. Authorized under the provisions of 10 CFR 50.59; or c. Otherwise approved by the Nuclear Regulatory Commission.
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 5.6.7.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 3988 MWt.
REACTOR PROTECTION SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until 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.

(continued)

1.1 Definitions (continued)

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 accouned for in the determination of SDM.
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 consists of two components: a. The time from initial movement of the main turbine stop valve or control valve until 80% of the turbine bypass capacity is established; and b. The time from initial movement of the main turbine stop valve or control valve until initial movement of the turbine bypass valve. 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	> 200
4	Cold Shutdown(a)	Shutdown	≤ 200
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.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
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, 1.c, 1.d, 2.a, 2.b, 2.c, and 2.d. ----------	
		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		
	B.2	----------NOTE---------- Only applicable for Functions 3.a and 3.b. ----------	
		Declare High Pressure Core Spray (HPCS) System inoperable.	1 hour from discovery of loss of HPCS initiation capability
	AND		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
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.e, 1.f, 1.g, 1.h, 1.i, 1.j, 2.e, 2.f, 2.g, 2.h, and 2.i. ----------	
		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
D. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	D.1	----------NOTE---------- Only applicable if HPCS pump suction is not aligned to the suppression pool. ----------	
		Declare HPCS System inoperable.	1 hour from discovery of loss of HPCS initiation capability
	AND		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. (continued)	D.2.1	Place channel in trip.	24 hours
	OR		
	D.2.2	Align the HPCS 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 Functions 1.k, 1.l, and 2.j. ----------	
		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		
	E.2	Restore channel to OPERABLE status.	7 days

(continued)

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.5.1-1 to determine which SRs apply for each ECCS 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 or the redundant Function maintains ECCS initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.3	Calibrate the trip unit.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.5	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.5.1-1 (page 1 of 5)
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. Low Pressure Coolant Injection-A (LPCI) and Low Pressure Core Spray (LPCS) Subsystems					
a. Reactor Vessel Water Level – Low, Level 3	1,2,3	2	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 157.8 inches
b. Reactor Vessel Water Level – Low Low Low, Level 1	1,2,3	2(a)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 10.8 inches
c. Drywell Pressure – High	1,2,3	2(a)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 1.88 psig
d. Drywell Pressure – High (Boundary Isolation)	1,2,3	2	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 1.88 psig
e. LPCS Pump Start – Time Delay Relay (Normal Power)	1,2,3	1	C	SR 3.3.5.1.2 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 12 seconds
f. LPCI Pump A Start – Time Delay Relay (Normal Power)	1,2,3	1	C	SR 3.3.5.1.2 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 7 seconds
g. LPCS Pump Start – Time Delay Relay (Emergency Power)	1,2,3	1	C	SR 3.3.5.1.2 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 6.75 seconds
h. LPCI Pump A Start – Time Delay Relay (Emergency Power)	1,2,3	1	C	SR 3.3.5.1.2 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 2 seconds
i. LPCS Differential Pressure – Low (Injection Permissive)	1,2,3	1	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 40 psid and ≤ 98 psid

(continued)

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

Table 3.3.5.1-1 (page 2 of 5)
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. LPCI A and LPCS Subsystems (continued)					
j. LPCI A Differential Pressure – Low (Injection Permissive)	1,2,3	1	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 70 psid and ≤ 150 psid
k. LPCS Pump Discharge Flow — Low (Bypass)	1,2,3	1	E	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 1000 gpm and ≤ 1440 gpm
l. LPCI Pump A Discharge Flow – Low (Bypass)	1,2,3	1	E	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 770 gpm and ≤ 930 gpm
m. Manual Initiation	1,2,3	2	C	SR 3.3.5.1.6	NA
2. LPCI B and LPCI C Subsystems					
a. Reactor Vessel Water Level – Low, Level 3	1,2,3	2	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 157.8 inches
b. Reactor Vessel Water Level – Low Low Low, Level 1	1,2,3	2(a)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 10.8 inches
c. Drywell Pressure – High	1,2,3	2(a)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 1.88 psig

(continued)

(a) Also required to initiate the associated DG.

Table 3.3.5.1-1 (page 3 of 5)
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 B and LPCI C Subsystems (continued)					
d. Drywell Pressure – High (Boundary Isolation)	1,2,3	2	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 1.88 psig
e. LPCI Pump B Start – Time Delay Relay (Normal Power)	1,2,3	1	C	SR 3.3.5.1.2 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 7 seconds
f. LPCI Pump C Start — Time Delay Relay (Normal Power)	1,2,3	1	C	SR 3.3.5.1.2 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 12 seconds
g. LPCI Pump B Start – Time Delay Relay (Emergency Power)	1,2,3	1	C	SR 3.3.5.1.2 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 2 second
h. LPCI Pump C Start – Time Delay Relay (Emergency Power)	1,2,3	1	C	SR 3.3.5.1.2 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 7 second
i. LPCI B and C Differential Pressure – Low (Injection Permissive)	1,2,3	1 per valve	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 70 psid and ≤ 150 psid
j. LPCI Pump B and LPCI Pump C Discharge Flow – Low (Bypass)	1,2,3	1 per pump	E	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 770 gpm and ≤ 930 gpm
k. Manual Initiation	1,2,3	2	C	SR 3.3.5.1.6	NA

(continued)

Table 3.3.5.1-1 (page 4 of 5)
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
3. High Pressure Core Spray (HPCS) System					
a. Reactor Vessel Water Level – Low Low, Level 2	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 3.3.5.1.5 SR 3.3.5.1.6	≥ 101.8 inches
b. Drywell Pressure – High (b)	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 3.3.5.1.5 SR 3.3.5.1.6	≤ 1.88 psig
c. Reactor Vessel Water Level – High, Level 8	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 209.3 inches
d. Pump Suction Pressure – Low	1,2,3	2	D	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 94.5 inches H_2O
e. Pump Suction Pressure – Timer	1,2,3	1	D	SR 3.3.5.1.2 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 5.5 seconds
f. Suppression Pool Water Level – High	1,2,3	2	D	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ 200.7 ft
g. HPCS Pump Discharge Pressure – High (Bypass)	1,2,3	1	E	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 220 psig
h. HPCS System Flow Rate – Low (Bypass)	1,2,3	1	E	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ 580 gpm and ≤ 720 gpm
i. Manual Initiation (b)	1,2,3	2	C	SR 3.3.5.1.6	NA

(continued)

(a) Also required to initiate the associated DG.
(b) The injection functions of Drywell Pressure-High and Manual Initiation are not required to be OPERABLE with reactor steam dome pressure less than 600 psig.

3.3 INSTRUMENTATION

3.3.5.2 Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation

LCO 3.3.5.2
The RPV Water Inventory Control instrumentation for each Function in Table 3.3.5.2-1 shall be OPERABLE.

APPLICABILITY:
According to Table 3.3.5.2-1.

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 3.3.5.2-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.2-1	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 3.3.5.2-1.	C.1	Place channel in trip.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	D.1 Declare HPCS system inoperable. OR D.2 Align the HPCS pump suction to the suppression pool.	1 hour 1 hour
E. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	E.1 Restore channel to OPERABLE status.	24 hours
F. Required Action and associated Completion Time of Condition C, D, or E not met.	F.1 Declare associated ECCS injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

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

1. Refer to Table 3.3.5.2-1 to determine which SRs apply for each ECCS 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 or the redundant Function maintains ECCS initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.2.3	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.5.2-1 (page 1 of 2)
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.	Low Pressure Coolant Injection-A (LPCI) and Low Pressure Core Spray (LPCS) Subsystems					
a.	LPCS Differential Pressure-Low (Injection Permissive)	4, 5	1(a)	C	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 40 psid and ≤ 98 psid
b.	LPCI A Differential Pressure-Low (Injection Permissive)	4, 5	1(a)	C	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 70 psid and ≤ 150 psid
c.	LPCS Pump Discharge Flow-Low (Bypass)	4, 5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 1000 gpm and ≤ 1440 gpm
d.	LPCI Pump A Discharge Flow-Low (Bypass)	4, 5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 770 gpm and ≤ 930 gpm
e.	Manual Initiation	4, 5	1 per subsystem (a)	E	SR 3.3.5.2.3	N/A
2.	LPCI B and LPCI C Subsystems					
a.	LPCI B and C Differential Pressure-Low (Injection Permissive)	4, 5	1(a)	C	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 70 psid and ≤ 150 psid
b.	LPCI Pump B and LPCI Pump C Discharge Flow-Low (Bypass)	4, 5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 770 gpm and ≤ 930 gpm
c.	Manual Initiation	4, 5	1 per subsystem	E	SR 3.3.5.2.3	N/A

(continued)

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

Table 3.3.5.2-1 (page 2 of 2)
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
3.	High Pressure Core Spray (HPCS) System					
	a. Pump Suction Pressure-Low	4[(b)], 5[(b)]	1(a)	D	SR 3.3.5.2.1 SR 3.3.5.2.2	≥94.5 inches H_2O
	b. HPCS Pump Discharge Pressure-High (Bypass)	4, 5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 220 psig
	c. HPCS System Flow Rate-Low (Bypass)	4, 5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	> 580 gpm and ≤ 720 gpm
4.	RHR System Isolation					
	a. Reactor Vessel Water Level-Low, Level 3	(c)	2 in one Trip system	B	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 157.8 inches
5.	Reactor Water Cleanup (RWCU) System Isolation					
	a. Reactor Vessel Water Level-Low Low, Level 2	(c)	2 in one Trip system	B	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 101.8 inches

(a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.2, "Reactor Pressure Vessel Water Inventory Control."
(b) When HPCS is OPERABLE for compliance with LCO 3.5.2, "RPV Water Inventory Control," and aligned to the condensate storage tank.
(c) When automatic isolation of the associated penetration flow path(s) is credited in calculating DRAIN TIME.

3.3 INSTRUMENTATION

3.3.5.3 Reactor Core Isolation Cooling (RCIC) System Instrumentation

LCO 3.3.5.3
The RCIC System instrumentation for each Function in Table 3.3.5.3-1 shall be OPERABLE.

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

ACTIONS

----------NOTES----------
1. Separate Condition entry is allowed for each channel.

2. When the Function 2 channels are placed in an inoperable status solely for performance of SR 3.5.3.4, entry into associated Conditions and Required Actions is not required.

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 RCIC System inoperable.	1 hour from discovery of loss of RCIC initiation capability
	AND		
	B.2	Place channel in trip.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	C.1	Restore channel to OPERABLE status.	24 hours
D. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	D.1	----------NOTE---------- Only applicable if RCIC pump suction is not aligned to the suppression pool. ----------	
		Declare RCIC System inoperable.	1 hour from discovery of loss of RCIC initiation capability
	AND		
	D.2.1	Place channel in trip.	24 hours
	OR		
	D.2.2	Align RCIC pump suction to the suppression pool.	24 hours
E. Required Action and associated Completion Time of Condition B, C, or D not met.	E.1	Declare RCIC System inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.5.3-1 to determine which SRs apply for each RCIC 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 as follows: (a) for up to 6 hours for Functions 4 and 5; and (b) for up to 6 hours for Functions 1, 2, and 3 provided the associated Function maintains RCIC initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.3.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.3	Calibrate the trip units.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.5.3.1 (page 1 of 1)
Reactor Core Isolation Cooling System Instrumentation

	FUNCTION	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1.	Reactor Vessel Water Level – Low Low, Level 2	4	B	SR 3.3.5.3.1 SR 3.3.5.3.2 SR 3.3.5.3.3 SR 3.3.5.3.4 SR 3.3.5.3.5	≥ 101.8 inches
2.	Reactor Vessel Water Level – High, Level 8	4	B	SR 3.3.5.3.1 SR 3.3.5.3.2 SR 3.3.5.3.3 SR 3.3.5.3.4 SR 3.3.5.3.5	≤ 209.3 inches
3.	Pump Suction Pressure – Low	2	D	SR 3.3.5.3.1 SR 3.3.5.3.2 SR 3.3.5.3.3 SR 3.3.5.3.4 SR 3.3.5.3.5	≥ 101 inches Wg
4.	Pump Suction Pressure – Timer	1	D	SR 3.3.5.3.2 SR 3.3.5.3.4 SR 3.3.5.3.5	≤ 12.3 seconds
5.	Manual Initiation (a)	2	C	SR 3.3.5.3.5	NA

(a) The injection function of Manual Initiation is not required to be OPERABLE with reactor steam dome pressure less than 600 psig.

Table 3.3.6.1-1 (page 5 of 5)
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.	RHR SDC System Isolation (continued)					
b.	Reactor Vessel Water Level – Low, Level 3	3	2	J	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.6	≥ 157.8 inches
c.	Reactor Vessel Pressure – High	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 148 psig
d.	Reactor Building Pipe Chase Area Temperature – High	3	1 per area	F	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	
	El. ≈ 319 ft.					≤ 144.5°F
	El. ≈ 292 ft.					≤ 140.5°F
	El. ≈ 266 ft.					≤ 140.5°F
	El. ≈ 227 ft.					≤ 140.5°F
e.	Reactor Building General Area Temperature – High	3	1 per area	F	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 134°F
f.	Manual Initiation	1,2,3	4	G	SR 3.3.6.1.6	NA

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

FUNCTION	APPLICABLE MODES AND OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low Low, Level 2	1,2,3	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	≥ 101.8 inches
2. Drywell Pressure – High	1,2,3	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	≤ 1.88 psig
3. Reactor Building Above the Refuel Floor Exhaust Radiation – High	1,2,3, (a)	1	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.4 SR 3.3.6.2.5	≤ 2.46×10^{-3} µCi/cc
4. Reactor Building Below the Refuel Floor Exhaust Radiation – High	1,2,3, (a)	1	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.4 SR 3.3.6.2.5	≤ 2.46×10^{-3} µCi/cc

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

Table 3.3.7.1-1 (page 1 of 1)
Control Room Envelope Filtration System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level – Low Low, Level 2	1,2,3	2	B	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4 SR 3.3.7.1.5	≥ 101.8 inches
2. Drywell Pressure – High	1,2,3	2	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4 SR 3.3.7.1.5	≤ 1.88 psig
3. Main Control Room Ventilation Radiation Monitor – High	1,2,3, (a)	2	B	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.4 SR 3.3.7.1.5	≤ 5.92×10^{-6} µCi/cc

(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 – Logic

LCO 3.3.8.2 Two RPS electric power monitoring assemblies shall be OPERABLE for each RPS logic bus.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or both RPS logic buses with one electric power monitoring assembly inoperable.	A.1	Restore electric power monitoring assembly(s) to OPERABLE status.	72 hours
B. One or both RPS logic buses with both electric power monitoring assemblies inoperable.	B.1	Restore electric power monitoring assemblies to OPERABLE status.	1 hour
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 AND C.2	Be in MODE 3. Be in MODE 4.	12 hours 36 hours

(continued)

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 both RHR SDC suction isolation valves open.	D.1 Initiate action to restore one electric power monitoring assembly to OPERABLE status for each RPS logic bus. OR D.2 Initiate action to isolate the RHR SDC 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 irradiated fuel assemblies in the secondary containment or during CORE ALTERATIONS.	F.1.1 Isolate the associated secondary containment penetration flow path(s). OR F.1.2 Declare associated secondary containment isolation valves inoperable. AND	Immediately Immediately (continued)

3.5 EMERGENCY CORE COOLING SYSTEMS (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 six safety/relief valves shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3, except 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 HPCS.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One low pressure ECCS injection/spray subsystem inoperable.	A.1 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	7 days
B. High Pressure Core Spray (HPCS) System inoperable.	B.1 Verify by administrative means RCIC System is OPERABLE when RCIC is required to be OPERABLE. AND B.2 Restore HPCS System to OPERABLE status.	Immediately 14 days

(continued)

3.5 EMERGENCY CORE COOLING SYSTEMS (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 top of active fuel (TAF) shall be ≥ 36 hours.

AND

One 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 (continued)

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 establish secondary containment boundary.	Immediately
	AND		

(continued)

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.	Immediately
	AND		
	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 DRAIN TIME ≥ 36 hours.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.5.2.2	Verify, for a required low pressure ECCS injection/spray subsystem, the suppression pool water level is ≥ 195 ft.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	Verify, for a required High Pressure Core Spray (HPCS) System, the: a. Suppression pool water level is ≥ 195 ft. OR b. Condensate storage tank B water level is ≥ 26.9 ft.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify, for the required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.5	----------NOTE---------- Not required to be met for system vent 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.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.5.2.6	----------NOTE---------- Not required to be met for ECCS pumps aligned for shutdown cooling. ---------- Operate the required ECCS injection/spray subsystem through the recirculation line for ≥ 10 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.7	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.8	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify the required LPCI or LPCS subsystem actuates on a manual initiation signal or the required HPCS subsystem can be manually operated.	In accordance with the Surveillance Frequency Control Program

3.5 EMERGENCY CORE COOLING SYSTEMS (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 RCIC.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. (continued)	E.3	Perform SR 3.6.1.3.6 for the resilient seal purge exhaust valves closed to comply with Required Action E.1.	Once per 92 days
F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met in MODE 1, 2, or 3.	F.1 AND F.2	Be in MODE 3. Be in MODE 4.	12 hours 36 hours
G. Required Action and associated Completion Time of Condition A, B, C, D, or E not met for PCIV(s) required to be OPERABLE during MODE 4 or 5.	G.1	Initiate action to restore valve(s) to OPERABLE status.	Immediately

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 AND B.2	Be in MODE 3. Be in MODE 4.	12 hours 36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify secondary containment vacuum is ≥ 0.25 inch of vacuum water gauge.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.1.2	Verify all secondary containment equipment hatches are closed and sealed.	In accordance with the Surveillance Frequency Control Program

(continued)

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 (continued)

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.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- D.1 Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately

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	Immediately (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2 Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately
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 the secondary containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for ≥ 15 continuous minutes with heaters operating.	In accordance with the Surveillance Frequency Control Program
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.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.3.4	Verify each SGT decay heat removal air inlet valve can be opened.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.2 Control Room Envelope Filtration (CREF) System

LCO 3.7.2 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. OR Two CREF subsystems inoperable with safety function maintained.	A.1	Restore CREF subsystem(s) to OPERABLE status.	7 days
B. One or more CREF subsystems inoperable due to inoperable CRE boundary in MODES 1, 2, or 3.	B.1	Initiate action to implement mitigating actions.	Immediately
	AND		
	B.2	Verify mitigating actions ensure CRE occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.	24 hours
	AND		
	B.3	Restore CRE boundary to OPERABLE status.	90 days

(continued)

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 components of CREF subsystem(s) equivalent to a single CREF subsystem in emergency pressurization mode. OR D.2 Suspend movement of recently irradiated fuel assemblies in the secondary containment.	 Immediately Immediately
E. Two CREF subsystems inoperable with safety function not maintained in MODE 1, 2, or 3 for reasons other than Condition B.	E.1 Enter LCO 3.0.3.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Two CREF subsystems inoperable with safety function not maintained during movement of recently irradiated fuel assemblies in the secondary containment. OR One or more CREF subsystems inoperable due to 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 3.7.2.1	Operate each CREF subsystem for ≥ 15 continuous minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.7.2.2	Perform required CREF System filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.2.3	Verify each CREF subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program

(continued)

3.7 PLANT SYSTEMS

3.7.3 Control Room Envelope Air Conditioning (AC) System

LCO 3.7.3 Two control room envelope AC subsystems for the areas listed below shall be OPERABLE:

a. Main Control Room area; and

b. Relay Room area.

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 envelope AC subsystem for the Main Control Room area inoperable.	A.1 Restore control room envelope AC subsystem for the Main Control Room area to OPERABLE status.	30 days
B. One control room envelope AC subsystem for the Relay Room area inoperable.	B.1 Restore control room envelope AC subsystem for the Relay Room area to OPERABLE status.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. 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. ---------- F.1 Place OPERABLE control room envelope AC subsystem for the Main Control Room area in operation. OR F.2 Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately Immediately
G. 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. ---------- G.1 Place OPERABLE control room envelope AC subsystem for the Relay Room area in operation. OR G.2 Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately Immediately

(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Verify each control room envelope AC subsystem has the capability to remove the assumed heat load for the Main Control Room area and the Relay Room area.	In accordance with the Surveillance Frequency Control Program

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO Item a. not met.	----------NOTE---------- Enter applicable Condition and Required Actions of LCO 3.8.9, when any required division is de-energized as a result of Condition A. ----------	
	A.1 Declare affected required feature(s) with no offsite power available inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2.2 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	AND	
	A.2.3 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. LCO Item b. not met.	B.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	B.2	Suspend movement of irradiated fuel assemblies in secondary containment.	Immediately
	AND		
	B.3	Initiate action to restore required DG to OPERABLE status.	Immediately
C. LCO Item c. not met.	C.1	Declare High Pressure Core Spray System inoperable.	72 hours

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 through SR 3.8.1.9, SR 3.8.1.11 through SR 3.8.1.14, SR 3.8.1.16, and SR 3.8.1.17. 2. SR 3.8.1.10 and SR 3.8.1.17 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 3.8.1.15 and SR 3.8.1.18, are applicable.	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources - Shutdown

LCO 3.8.5 The following DC electrical power subsystems shall be OPERABLE:

a. One Division 1 or Division 2 DC electrical power subsystem; and
b. The Division 3 DC electrical power subsystem, when the Division 3 onsite Class 1E DC electrical power distribution subsystem is required by LCO 3.8.9, "Distribution System – Shutdown."

APPLICABILITY: MODES 4 and 5,
During movement of 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 DC electric power subsystems inoperable.	A.1 Declare affected required feature(s) inoperable. OR A.2.1 Suspend CORE ALTERATIONS. AND A.2.2 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately Immediately Immediately

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	AND A.2.3 Initiate action to restore required DC electrical power subsystems to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	----------NOTE---------- The following SRs are not required to be performed: SR 3.8.4.7 and SR 3.8.4.8. ----------	
	For DC electrical power subsystems required to be OPERABLE the following SRs are applicable: SR 3.8.4.1, SR 3.8.4.2, SR 3.8.4.3, SR 3.8.4.4, SR 3.8.4.5, SR 3.8.4.6, SR 3.8.4.7, and SR 3.8.4.8.	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems – Shutdown

LCO 3.8.9 The necessary portions of the Division 1, Division 2, and Division 3 AC and DC and the Division 1 and Division 2 120 VAC uninterruptible electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY: MODES 4 and 5,
During movement of 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, DC, or 120 VAC uninterruptible 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 movement of irradiated fuel assemblies in the secondary containment.	Immediately Immediately Immediately

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	AND	
	A.2.3 Initiate actions to restore required AC, DC, and 120 VAC uninterruptible electrical power distribution subsystems to OPERABLE status.	Immediately
	AND	
	A.2.4 Declare associated required shutdown cooling subsystem(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and power availability to required AC, DC, and 120 VAC uninterruptible electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 168

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-69

NINE MILE POINT NUCLEAR STATION, LLC

LONG ISLAND LIGHTING COMPANY

EXELON GENERATION COMPANY, LLC

NINE MILE POINT NUCLEAR STATION, UNIT 2

DOCKET NO. 50-410

1.0 INTRODUCTION

By application dated February 28, 2017 (Reference 1), and supplemented by letters dated November 3 (Reference 2), December 27, 2017 (Reference 3), January 12 (Reference 4), and February 6, 2018 (Reference 5), Exelon Generation Company, LLC (Exelon, the licensee) requested to adopt Technical Specifications Task Force (TSTF) Improved Standard Technical Specifications Change Traveler 542 (TSTF-542), Revision 2, "Reactor Pressure Vessel Water Inventory Control" (Reference 6), for Nine Mile Point Nuclear Station, Unit 2 (NMP2). The U.S. Nuclear Regulatory Commission (NRC) approved TSTF-542, Revision 2, on December 20, 2016 (Reference 7).

The proposed changes would replace existing Technical Specification (TS) requirements associated with "operations with a potential for draining the reactor vessel" (OPDRVs), with revised TSs providing an alternative requirement for reactor pressure vessel (RPV) water inventory control (WIC). These alternative requirements would protect Safety Limit 2.1.1.3, 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 NMP2 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 licensee 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 below in Section 3.5.1 of this SE.

The supplemental letters referenced above provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on April 25, 2017 (82 FR 19102).

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 (RWCU), and shutdown cooling. 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 Mode 1 (Power Operation – Reactor Mode Switch in Run), Mode 2 (Startup – Reactor Mode Switch in Refuel (or Startup/Hot Standby)), and Mode 3 (Hot Shutdown[1] - Reactor Mode Switch in Shutdown and average reactor coolant temperature > 200 degrees Fahrenheit (°F), the TS for instrumentation and ECCS 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 ≤ 200°F), and Mode 5 (Refueling[2] - and 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 RPV head is removed, the water level is ≥ 22 feet 3 inches over the top of the RPV flange).

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

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

monitor for BWR RPV water level decrease from potential significant or even unexpected drainage paths. These potential drainage paths in Modes 4 and 5 generally would require less water replacement capability to maintain water above TAF.

To address the drain down potential during Modes 4 and 5, the existing NMP2 TSs contain specifications that are applicable during OPDRVs, or require suspension of OPDRVs if certain equipment is inoperable. The term OPDRVs is not specifically defined in the TS. 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 TSs.

2.2 Proposed TS Changes

Section 2.2.1 discusses the proposed addition of a new definition, "DRAIN TIME" (evaluated below in Section 3.1). Section 2.2.2 discusses the proposed revisions to TS 3.3, "Instrumentation," including the proposed revisions to TS 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation," the proposed addition of new TS 3.3.5.2, "Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation" (including Table 3.3.5.2), the proposed renumbering of existing TS 3.3.5.2, "Reactor Core Isolation Cooling (RCIC) System Instrumentation," to 3.3.5.3, and the proposed revisions to TS Table 3.3.6.1-1, "Primary Containment Isolation Instrumentation." Section 2.2.3 discusses the proposed revisions to TS 3.5, "Emergency Core Cooling Systems (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 discusses the proposed deletion of existing TS references to OPDRVs (evaluated below in Section 3.6). Section 2.2.5 discusses NMP2 plant-specific variations to TSTF-542, Revision 2 (evaluated below in Section 3.5.1).

2.2.1 Addition of DRAIN TIME Definition.

Reference 1 includes the following definition of "DRAIN TIME" that would be added to NMP2 TS 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 NMP2 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, B.2, C.1, and E.1, which states:

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

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

Proposed changes to Note 2 preceding the TS 3.3.5.1 Surveillance Requirements, which clarifies that Required Actions may be delayed for up to 6 hours. The licensee states that the listing of specific Functions is no longer necessary due to the implementation of TSTF-542.

The current Note 2 states:

> 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 as follows: (a) for up to 6 hours for Functions 3.e, 3.g, 3.h, and 3.i, and (b) for up to 6 hours for Functions other than 3.e, 3.g, 3.h, and 3.i, provided the associated Function or the redundant Function maintains ECCS initiation capability.

The proposed Note 2 states:

> 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 or the redundant Function maintains ECCS initiation capability.

For TS Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation," the applicability in Modes 4 and 5 was proposed for deletion because the instrumentation requirements during shutdown would be consolidated into the new TS 3.3.5.2. Modes 4 and 5 Applicability and associated requirements (i.e., Required Channels, SRs, allowable values (AVs), Footnotes, etc.) would be deleted for the following functions:

1. Low Pressure Coolant Injection - A (LPCI) and Low Pressure Core Spray (LPCS) Subsystems

    a. Reactor Vessel Water Level – Low, Level 3
    b. Reactor Vessel Water Level – Low Low Low, Level 1
    e. LPCS Pump Start - Time Delay Relay (Normal Power)
    f. LPCI Pump A Start - Time Delay Relay (Normal Power)
    g. LPCS Pump Start - Time Delay Relay (Emergency Power)
    h. LPCI Pump A Start - Time Delay Relay (Emergency Power)
    i. LPCS Differential Pressure - Low (Injection Permissive)
    j. LPCI A Differential Pressure - Low (Injection Permissive)
    k. LPCS Pump Discharge Flow - Low (Bypass)
    l. LPCI Pump A Discharge Flow - Low (Bypass)
    m. Manual Initiation

2. LPCI B and LPCI C Subsystems

    a. Reactor Vessel Water Level – Low, Level 3
    b. Reactor Vessel Water Level - Low Low Low, Level 1
    e. LPCI Pump B Start - Time Delay Relay (Normal Power)
    f. LPCI Pump C Start - Time Delay Relay (Normal Power)
    g. LPCI Pump B Start - Time Delay Relay (Emergency Power)
    h. LPCI Pump C Start - Time Delay Relay (Emergency Power)
    i. LPCI B and C Differential Pressure - Low (Injection Permissive)
    j. LPCI Pump B and LPCI Pump C Discharge Flow - Low (Bypass)
    k. Manual initiation

3 High Pressure Core Spray (HPCS) System

    a. Reactor Vessel Water Level - Low Low, Level 2
    c. Reactor Vessel Water Level – High, Level 8
    d. Pump Suction Pressure - Low
    e. Pump Suction Pressure - Timer
    g. HPCS Pump Discharge Pressure - High (Bypass)
    h. HPCS System Flow Rate - Low (Bypass)
    i. Manual initiation

Table 3.3.5.1-1, footnote (a), which states, "When associated ECCS subsystem(s) are required to be OPERABLE per LCO [Limiting Condition for Operation] 3.5.2," and footnote (c), which states, "When HPCS is OPERABLE for compliance with LCO 3.5.2 and aligned to the condensate storage tank while tank water level is not within the limit of SR 3.5.2.2," would be deleted. As a result, the existing Footnote (b) would be renumbered as (a), and Footnote (d) would be renumbered as (b).

2.2.2.2 New TS 3.3.5.2, "Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation"

The proposed new TS 3.3.5.2 would contain functions that are comprised of requirements moved from TSs 3.3.5.1 and 3.3.6.1, as well as new requirements. The proposed new TS 3.3.5.2 is shown below:

3.3.5.2 Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation

LCO 3.3.5.2 The RPV Water Inventory Control instrumentation for each Function in Table 3.3.5.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5.2-1

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 3.3.5.2-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	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 3.3.5.2-1.	C.1 Place channel in trip.	1 hour
D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	D.1 Declare HPCS system inoperable. OR	1 hour 1 hour

	D.2 Align the HPCS pump suction to the suppression pool.	
E. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	E.1 Restore channel to OPERABLE status.	24 hours
F. Required Action and associated Completion Time of Condition C, D, or E not met.	F.1 Declare associated ECCS injection/spray subsystem inoperable	Immediately

SURVEILLANCE REQUIREMENTS

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

1. Refer to Table 3.3.5.2-1 to determine which SRs apply for each ECCS 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 or the redundant Function maintains ECCS initiation capability.

SURVEILLANCE	FREQUENCY
SR 3.3.5.2.1 Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.2.2 Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.2.3 Perform LOGIC SYSTEM FUNCTIONAL TEST	In accordance with the Surveillance Frequency Control Program

The proposed TS Table 3.3.5.2-1, "RPV Water Inventory Control Instrumentation," is shown below and would include three footnotes.

Table 3.3.5.2-1
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. Low Pressure Coolant Injection-A (LPCI) and Low Pressure Core Spray (LPCS) Subsystems					
a. LPCS Differential Pressure-Low (Injection Permissive)	4,5	1(a)	C	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 40 psid and ≤ 98 psid
b. LPCI A Differential Pressure-Low (Injection Permissive)	4,5	1(a)	C	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 70 psid and ≤ 150 psid
c. LPCS Pump Discharge Flow-Low (Bypass)	4,5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 1000 gpm and ≤ 1440 gpm
d. LPCI Pump A Discharge Flow-Low (Bypass)	4,5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 770 gpm and ≤ 930 gpm
e. Manual Initiation	4,5	1 per subsystem (a)	E	SR 3.3.5.2.3	N/A

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. LPCI B and LPCI C Subsystems					
a. LPCI B and C Differential Pressure-Low (Injection Permissive)	4,5	1 (a)	C	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 70 psid and ≤ 150 psid
b. LPCI Pump B and LPCI Pump C Discharge Flow-Low (Bypass)	4,5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 770 gpm and ≤ 930 gpm
c. Manual Initiation	4,5	1 per subsystem	E	SR 3.3.5.2.3	N/A
3. High Pressure Core Spray (HPCS) System					
a. Pump Suction Pressure-Low	4(b),5(b)	1(a)	D	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 94.5 inches H2O
b. HPCS Pump Discharge Pressure-High (Bypass)	4,5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 220 psig
c. HPCS System Flow Rate-Low (Bypass)	4,5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	> 580 gpm and ≤ 720 gpm

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. RHR System Isolation a. Reactor Vessel Water Level - Low, Level 3	(c)	2 in one Trip system	B	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 157.8 inches
5. Reactor Water Cleanup (RWCU) System Isolation a. Reactor Vessel Water Level- Low Low, Level 2	(c)	2 in one Trip system	B	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 101.8 inches

Proposed Table 3.3.5.2-1 Footnotes:

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

(b) When HPCS is OPERABLE for compliance with LCO 3.5.2, "RPV Water Inventory Control," and aligned to the condensate storage tank.

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

2.2.2.2 Existing TS 3.3.5.2, "Reactor Core Isolation Cooling (RCIC) System Instrumentation"

The existing TS 3.3.5.2, "Reactor Core Isolation Cooling (RCIC) System Instrumentation," and its subsection would be renumbered to TS 3.3.5.3 in order to maintain the TS numbering conventions.

2.2.2.3 TS 3.3.6.1, "Primary Containment Isolation Instrumentation"

In Table 3.3.6.1-1, "Primary Containment Isolation Instrumentation," the following instrumentation Function was proposed to be deleted for Modes 4 and 5 since it is associated with OPDRVs:

5. RHR SDC System Isolation

   b. Reactor Vessel Water Level –Low, Level 3

Also, by letter dated February 6, 2018 (Reference 5), Note (d) from Table 3.3.6.1-1 is proposed to be deleted. Note (d) states:

> Only one trip system required in MODES 4 and 5 with RHR Shutdown Cooling System integrity maintained.

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

The Title of NMP2 TS Section 3.5 would be revised from "Emergency Core Cooling Systems (ECCS) and Reactor Core Isolation Cooling (RCIC) System" to "Emergency Core Cooling Systems (ECCS), RPV Water Inventory Control, and Reactor Core Isolation Cooling (RCIC) System."

The Title of NMP2 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 to state 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 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 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 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 establish secondary containment boundary. AND D.3 Initiate action to isolate each secondary containment penetration flow path or verify it	 Immediately Immediately Immediately

	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
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 DRAIN TIME ≥ 36 hours.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.2	Verify, for a required low pressure ECCS injection/spray subsystem, the suppression pool water level is ≥ 195 ft.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	Verify, for a required High Pressure Core Spray (HPCS) System, the: a. Suppression pool water level is ≥ 195 ft. OR b. Condensate storage tank B water level is ≥ 26.9 ft.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify, for the required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.5	----------NOTE---------- Not required to be met for system vent 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.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	----------NOTE----------	

	Not required to be met for ECCS pumps aligned for shutdown cooling. ---------- Operate the required ECCS injection/spray subsystem through the recirculation line for ≥ 10 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.7	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.8	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify the required LPCI or LPCS subsystem actuates on a manual initiation signal or the required HPCS subsystem can be manually operated.	In accordance with the Surveillance Frequency Control Program

2.2.4 Deletion of References to OPDRVs and Additional Miscellaneous Changes

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 2.1.1.3. To remain consistent with TSTF-542, all references to the term OPDRVs in the NMP2 TSs would be deleted. The TS locations of these references are summarized as follows:

NMP2 TS Limiting Condition for Operation (LCO)	Location of OPDRV Reference
3.3.6.2, "Secondary Containment Isolation Instrumentation"	Table 3.3.6.2-1, Footnote (a)
3.3.7.1, "Control Room Envelope Filtration (CREF) System Instrumentation"	Table 3.3.7.1-1, Footnote (a)
3.3.8.2, "Reactor Protection System (RPS) Electric Power Monitoring – Logic"	Applicability, Condition F
3.6.1.3, "Primary Containment Isolation Valves (PCIVs)"	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, Condition C, Condition E
3.7.2, "Control Room Envelope Filtration (CREF) System"	Applicability, Condition D, Condition F
3.7.3, "Control Room Envelope Air Conditioning (AC) System"	Applicability, Condition F, Condition G, Condition H
3.8.2, "AC Sources – Shutdown"	Condition A, Condition B
3.8.5, "DC Sources – Shutdown"	Condition A
3.8.9, "Distribution Systems – Shutdown"	Condition A

By letter dated November 3, 2017 (Reference 2), the licensee responded to several NRC staff requests for additional information. Specifically, the licensee clarified aspects of the submittal associated with proposed new TS Table 3.3.5.2-1, Function 3.e, "Manual Initiation"; Required Action for LCO 3.3.5.2, Condition E; TS Table 3.3.5.2-1, Functions 2.a and 1.d; and TS Table 3.3.6.2, Function 3.

By letter dated December 27, 2017 (Reference 3), the licensee addressed an instrumentation requirement associated with proposed new TS Table 3.3.5.2-1, Function 3.a, "Reactor Vessel Water Level High, Level 8," and Function 3.e, "Manual Initiation." The staff evaluation of the licensee's proposed change is discussed below in Section 3.5.8, Variation 8.

By letter dated January 12, 2018 (Reference 4), the licensee addressed new proposed TS markup pages associated with TS pages 3.3.5.2-2, 3.3.5.2-4, and 3.3.5.2-5. The staff evaluation of the licensee's proposed change is discussed below in Section 3.2.4.1.

By letter dated February 6, 2018 (Reference 5), the licensee addressed new proposed TS markup pages associated with TS pages 3.3.5.2-5 and 3.3.6.1-10. The staff evaluation of the licensee's proposed change is discussed below in Section 3.2.4.1.

2.2.5 NMP2 Plant-Specific TSTF-542 TS 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. The licensee stated in the license amendment request (LAR) (Reference 1) that these variations do not affect the applicability of TSTF-542 or the NRC staff's SE to the proposed license amendment. Section 3.5 of this SE includes the staff's evaluation of each of these technical variations.

2.2.5.1 Variation 1, TS Section 3.3.5.1 Surveillance Requirements Note 2

In TS Section 3.3.5.1, the licensee proposes to change Note 2 preceding the SRs to state that actions may be delayed for up to 6 hours. The licensee states that the listing of specific Functions 3.e, 3.g, 3.h, and 3.i is no longer necessary due to the implementation of TSTF-542. Note 2 is in the current NMP2 TS and was implemented during the original conversion to the Improved Standard Technical Specifications (STS) for NMP2.

2.2.5.2 Variation 2, TS Table 3.3.5.1-1, LPCS/LPCI Reactor Vessel Water Level Low, Level 3 and Drywell Pressure Functions

The ECCS Instrumentation for NMP2 includes Functions 1.a and 2.a, "Reactor Vessel Water Level - Low, Level 3," and 1.d and 2.d, "Drywall Pressure - High (Boundary Isolation)," to isolate Residual Heat Removal (RHR) boundary valves and ensure injection of water into the reactor vessel, as described in the current NMP2 TS Bases.

The TSTF-542, Functions 1.a and 1.b, align to NMP2 Functions 1.b and 1.c, respectively, for LPCS and LPCI-A. The TSTF-542, Functions 2.a and 2.b, align to NMP2 Functions 2.b and 2.c, respectively, for LPCI-B and LPCI-C.

2.2.5.3 Variation 3, TS Table 3.3.5.1-1, LPCS and LPCI Time Delay Relays

The TSTF-542, TS Table 3.3.5.1-1, Function 1.c, "LPCI Pump A Start - Time Delay Relay," aligns with the NMP2 Function 1.f, and is clarified as "(Normal Power)." The existing Functions 1.e, "LPCS Pump Start - Time Delay Relay (Normal Power)," 1.g, "LPCS Pump Start - Time Delay Relay (Emergency Power)," and 1.h, "LPCI Pump A Start - Time Delay Relay (Emergency Power)," are retained to accommodate existing NMP2 instrumentation. The Pump Start - Time Delay Relays (Normal and Emergency Power) are assumed to be operable in the accident and transient analyses requiring ECCS initiation. The applicability of these Functions is modified and Modes 4 and 5 are removed to align with the intent of TSTF-542.

The TSTF-542, TS Table 3.3.5.1-1, Function 2.c, "LPCI Pump B Start - Time Delay Relay," aligns with the NMP2 Function 2.e, and is clarified as "(Normal Power)." The existing NMP2 Functions 2.f, "LPCI Pump C Start - Time Delay Relay (Normal Power)," 2.g, "LPCI Pump B Start - Time Delay Relay (Emergency Power)," and 2.h, "LPCI Pump C Start - Time Delay Relay (Emergency Power)," are retained to accommodate existing NMP2 Instrumentation. The Pump Start - Time Delay Relays (Normal and Emergency Power) are assumed to be operable in the accident and transient analyses requiring ECCS initiation. The applicability of these Functions is modified and Modes 4 and 5 are removed to align with the intent of TSTF-542.

2.2.5.4 Variation 4, TS Tables 3.3.5.1-1 and 3.3.5.2-1, LPCS and LPCI Reactor Dome Pressure (Injection Permissive)

Table 3.3.5.1-1:

The TSTF-542, TS Table 3.3.5.1-1, Function 1.d, "Reactor Steam Dome Pressure - Low (Injection Permissive)," is modified to align with the NMP2 instrumentation for Injection Permissive using 1.i, "LPCS Differential Pressure - Low (Injection Permissive)," and 1.j, "LPCI A Differential Pressure - Low (Injection Permissive)." Low differential pressure signals across the injection valves are used as permissives for the low pressure ECCS subsystems. The applicability of these Functions is modified and Modes 4 and 5 are removed to align with the intent of TSTF-542.

The TSTF-542, TS Table 3.3.5.1-1, Function 2.d, "Reactor Steam Dome Pressure - Low (Injection Permissive)," is modified to align with the NMP2 instrumentation for Injection Permissive using 2.i, "LPCI B and C Differential Pressure - Low (Injection Permissive)." Low differential pressure signals across the injection valves are used as permissives for the low pressure ECCS subsystems. The applicability of this Function is modified and modes 4 and 5 are removed to align with the intent of TSTF-542. The REQUIRED CHANNELS PER FUNCTION is modified to be "1" (Reference 2).

Table 3.3.5.2-1:

The TSTF-542, TS Table 3.3.5.2-1, Function 1.a, "Reactor Steam Dome Pressure - Low (Injection Permissive)," is modified to align with the NMP2 instrumentation for Injection Permissive using 1.a, "LPCS Differential Pressure - Low (Injection Permissive)," and 1.b, "LPCI A Differential Pressure - Low (Injection Permissive)."

The TSTF-542, TS Table 3.3.5.2-1, Function 2.a, "Reactor Steam Dome Pressure - Low (Injection Permissive)," is modified to align with the NMP2 instrumentation for Injection

Permissive and is renamed as 2.a, "LPCI B and C Differential Pressure – Low (Injection Permissive)."

2.2.5.5 Variation 5, TS Table 3.3.5.1-1, HPCS and Condensate Storage Tank Level

The TSTF-542, TS Table 3.3.5.1-1, Function 3.d, "Condensate Storage Tank Level – Low," is modified to align with the NMP2 instrumentation for 3.d, "Pump Suction Pressure - Low," and 3.e, "Pump Suction Pressure - Timer." Low pump suction pressure, which is an indication of low level in the Condensate Storage Tank (CST), indicates the unavailability of an adequate supply of makeup water from this normal source. The applicability of these Functions is modified and Modes 4 and 5 are removed to align with the intent of TSTF-542.

2.2.5.6 Variation 6, TS Section 3.3.5.2 Surveillance Requirements Note 2

The Notes section preceding the SRs in proposed new TS Section 3.3.5.2 is clarified by adding a Note 2. This Note 2 is carried over from the current NMP2 TS from LCO 3.3.5.1 to align with the other changes in Section 3.3.5.2 created by implementing TSTF-542.

2.2.5.7 Variation 7, SR 3.5.2.6 Note

The revised SR 3.5.2.6, is modified with a note to allow an ECCS pump that is already aligned for shutdown cooling to stay aligned and minimize the risk associated with realigning to minimum flow for $\geq$ 10 minutes and then manipulating the plant again to realign back to shutdown cooling mode.

2.2.5.8 Variation 8, TS Table 3.3.5.2-1, HPCS Manual Initiation and Reactor Vessel Water Level - High, Level 8

Variation 8 is added based on References 3 and 4.

TS Table 3.3.5.2-1 is revised to reflect the NMP2 design. Function 3, "High Pressure Core Spray (HPCS) System," Function 3.a, "Reactor Vessel Water Level - High, Level 8," and Function 3.e, "Manual initiation," that appear in TSTF-542, are not included in the proposed TSs. This corrects an issue in TSTF-542 that affects the BWR/5 and BWR/6 ECCS instrumentation requirements.

The purpose of the manual initiation function is to allow manual actuation of the ECCS subsystem required by TS 3.5.2 to mitigate a draining event. The Reactor Vessel Water Level - High, Level 8 signal prevents overfilling of the reactor vessel into the main steam lines by closing the HPCS injection valves when the water level is above the Level 8 setpoint.

In addition to the deletion of the Functions noted above from TS Table 3.3.5.2-1, LCO 3.3.5.2, Condition E, is no longer necessary since the Reactor Vessel Water Level - High, Level 8 Function is deleted. Condition E (Reference 1) states:

E. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	E.1 Declare HPCS system inoperable. AND E.2 Restore channel to OPERABLE status.	1 hour 24 hour

SR 3.5.2.8 is changed since the HPCS manual actuation is deleted. The proposed changes are:

> Verify the required LPCI or LPCS subsystem actuates on a manual initiation signal or the required HPCS subsystem can be manually operated.

2.3 Applicable Regulatory Requirements

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. 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 FR 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 at 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 at 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-1434, Revision 4 (Reference 9), contains the STS for BWR/6 plants and is part of the regulatory standardization effort. The NRC staff has prepared STS 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 [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants" (Reference 8).

2.3.1 NMP2 Applicable Design Requirements

The NMP2 Updated Safety Analysis Report, Revision 22, Section 3.1 "Conformance with NRC General Design Criteria" (Reference 9), describes an evaluation of the design bases of NMP2 as measured against the NRC General Design Criteria for Nuclear Power Plants at Appendix A to 10 CFR Part 50, effective May 21, 1971, and subsequently amended February 20, 1976. The following criteria are related to this LAR.

Criterion 13 – "Instrumentation and Control"

Instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.

Criterion 14 – "Reactor Coolant Pressure Boundary"

The reactor coolant pressure boundary shall be designed, fabricated, erected, and tested so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture.

Criterion 30 – "Quality of Reactor Coolant Pressure Boundary"

Components which are part of the reactor coolant pressure boundary shall be designed, fabricated, erected, and tested to the highest quality standards practical. Means shall be provided for detecting and, to the extent practical, identifying the location of the source of reactor coolant leakage.

Criterion 33 – "Reactor Coolant Makeup"

A system to supply reactor coolant makeup for protection against small breaks in the reactor coolant pressure boundary shall be provided. The system safety function shall be to assure that specified acceptable fuel design limits are not exceeded as a result of reactor coolant loss due to leakage from the reactor coolant pressure boundary and rupture of small piping or other small components, which are part of the boundary. The system shall be designed to assure that for

onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available), the system safety function can be accomplished using the piping, pumps, and valves used to maintain coolant inventory during normal reactor operation.

Criterion 35 – "Emergency Core Cooling"

A system to provide abundant emergency core cooling shall be provided. The system safety function shall be to transfer heat from the reactor core following any loss of reactor coolant at a rate such that:

(1) fuel and clad damage that could interfere with continued effective core cooling is prevented and

(2) clad metal-water reaction is limited to negligible amounts.

Suitable redundancy in components and features, and suitable interconnections, leak detection, isolation, and containment capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure.

3.0 TECHNICAL EVALUATION

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 TSTF-542. For the purpose of NRC 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 proposed in TSTF-542. Based on information furnished by the licensee in Reference 1, the NRC staff has determined the licensee is appropriately adopting the principles of drain time as specified in TSTF-542. The NRC has reasonable assurance that the licensee will include all RPV penetrations below the TAF in the determination of drain time as potential pathways. 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 concluded that the licensee will use methods resulting in conservative calculations to determine RPV drain time, thereby, protecting Safety Limit 2.1.1.3, which meets the requirements of 10 CFR 50.36(c)(3). Based on these considerations, the NRC staff has

determined the licensee's proposed addition of the drain time definition to the NMP2 TSs to be acceptable.

3.2 Staff Evaluation of Proposed TS 3.3.5.2, Reactor Pressure Vessel Water Inventory Control Instrumentation

The existing NMP2 TS 3.3.5.2, "Reactor Core Isolation Cooling (RCIC) System Instrumentation," is proposed to be renumbered as TS 3.3.5.3. This would achieve consistency within the NMP2 TS and, therefore, the NRC staff concludes that it is acceptable.

The purpose of the proposed new TS 3.3.5.2 is to support the requirements of the proposed new 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 proposed new TS 3.5.2. For NMP2, reactor operators have manual initiation push buttons that automatically align reactor injection.

Specifically, the proposed new TS 3.3.5.2 supports operation of the LPCI with subsystems LPCI A, LPCI B, and LPCI C, LPCS, and HPCS, including manual initiation when needed (refer to SE section 3.5.8 for details) as well as the system isolation of the RHR system and the RWCU system. The equipment involved with each of these systems is described in the evaluation of TS 3.5.2 and the Bases for LCO 3.5.2.

3.2.1 Staff Evaluation of Proposed TS 3.3.5.2 LCO and Applicability

In Reference 1, the licensee proposed a new TS 3.3.5.2 to provide alternative instrumentation requirements to support manual initiation of the ECCS injection/spray subsystem required in proposed new TS 3.5.2 and automatic isolation of penetration flow paths that may be credited in the determination of drain time. The current TS contain instrumentation requirements related to OPDRVs in TS Table 3.3.5.1-1, TS Table 3.3.6.1-1, TS Table 3.3.6.2-1, and TS Table 3.3.7.1-1. These requirements from TS Table 3.3.5.1-1 and TS Table 3.3.6.1-1 would be consolidated into proposed new TS 3.3.5.2.

The proposed LCO 3.3.5.2 would state:

> The RPV Water Inventory Control instrumentation for each Function in Table 3.3.5.2-1 shall be OPERABLE.

The proposed Applicability would state:

> According to Table 3.3.5.2-1.

In TSTF-542, Table 3.3.5.2-1 is selected to contain those instrumentation Functions needed to support manual initiation of the ECCS injection/spray subsystem required by LCO 3.5.2, and automatic isolation of penetration flow paths that may be credited in a calculation of drain time. The Functions in Table 3.3.5.2-1 are moved from existing TS 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation," and TS 3.3.6.1, "Primary Containment Isolation Instrumentation" functions that are required in Modes 4 or 5 or during OPDRVs. Creation of

TS 3.3.5.2 places these functions in a single location with requirements appropriate to support the safety function for TS 3.5.2. Reference 3 states that if desiring to inject water into the reactor pressure vessel using the HPCS, the reactor operator can follow procedural steps to take manual control of the pump and injection valve to add inventory.

The NRC staff has determined that the licensee's proposed alternative is acceptable for NMP2 since either HPCS, LPCS, or LPCI (or all three) subsystems would be available to perform the intended function to inject water into the RPV, which is consistent with the NRC-approved TSTF-542.

3.2.2 Staff Evaluation of Proposed TS 3.3.5.2 Actions

As discussed in Section 2.2.2.2 above, the NRC staff has determined that the licensee's proposed new TS 3.3.5.2 Actions are sufficient and necessary. This is because when one or more instrument channels are inoperable, the equipment and function controlled by these instruments 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 3.3.5.2-1 and directs the licensee to immediately enter the Condition referenced in Table 3.3.5.2-1 for that channel.
>
> Action B (concerning the RHR Shutdown Cooling (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 a re-calculation of drain time, but automatic isolation of the affected penetration flow paths cannot be credited.
>
> Action C (concerning LPCI and LPCS Differential Pressure-Low (injection permissive) functions necessary for ECCS subsystem manual initiation) would address an event in which the permissive is inoperable and manual start of ECCS using the control board switches is prevented. The function must be placed in the trip condition within 1 hour. With the permissive function instrument in the trip condition, manual pump injection may now be performed using the preferred control board switches. This 1 hour completion time is acceptable because 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 loss of adequate water supply for the HPCS system) addresses an event in which there is an inadequate water supply. The instrumentation functions have the ability to detect low-water setpoint in the CST and actuate valves to realign HPCS suction water source to the suppression pool. The HPCS system must be declared inoperable within 1 hour or the HPCS pump suction must be aligned to the suppression pool, since, if aligned, the function is already performed. This 1 hour is acceptable, because it provides sufficient time to take the action in order to minimize the possible risk of HPCS being needed without an adequate water source by allowing time for restoration or alignment of the HPCS pump suction to the suppression pool.

Action E (concerning LPCI or LPCS Discharge Flow - Low bypass function or HPCS Pump Discharge Pressure - High or System Flow Rate - Low bypass Function), addresses an event in which the bypass is inoperable and 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 valve to ensure that the pump does not overheat. Action E also addresses an event in which the manual push button for LPCI and LPCS is inoperable. If a manual initiation function is inoperable, the ECCS subsystem pumps can be started manually and the valves can be opened manually, but this is not the preferred condition. The 24-hour Completion Time was chosen to allow time for the operator to evaluate and repair any discovered inoperability. The Completion Time is appropriate given the ability to manually start the ECCS pumps and open the injection valves and to manually ensure that the pump does not overheat.

Action F is needed and becomes necessary, if the Required Action and associated Completion Time of Conditions C, D, or E are not met. If they are not met, then the associated ECCS injection/spray subsystem may be incapable of performing the intended function, and the ECCS subsystem must be declared inoperable immediately.

These Actions direct the licensee to take appropriate actions as necessary and enter immediately into the Conditions referenced in Table 3.3.5.2-1. 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 TS until the LCO can be met. Therefore, the staff has concluded that 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 that the licensee's proposed changes are acceptable.

3.2.3 Staff Evaluation of Proposed TS 3.3.5.2 Surveillance Requirements

The proposed new TS 3.3.5.2 SRs include Channel Checks, Channel Functional Tests, and Logic System Functional Tests. There are three SRs numbered SR 3.3.5.2.1, SR 3.3.5.2.2, and SR 3.3.5.2.3, respectively. The NRC staff has determined that these tests are sufficient and adequate because they are essential to ensure the Functions of TS 3.3.5.2 are operable (i.e., capable of performing the specified safety function in support of TS 3.5.2 and the protection from a potential drain down of the RPV in Modes 4 and 5). The NRC staff has determined that the proposed SRs of LCO 3.3.5.2 as described in Section 3.3.3 of the TSTF-542 justification, 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.

SR 3.3.5.2.1 would require a Channel Check and applies to all functions in TS Table 3.3.5.2-1 except the LPCS/LPCI Manual Initiation. 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 NRC staff has determined that this is acceptable because the frequency is in accordance with the Surveillance Frequency Control Program (SFCP), which is consistent with the existing requirements and supports operating shift situational awareness.

SR 3.3.5.2.2 would require a Channel Functional Test and applies to all functions in TS Table 3.3.5.2-1 except the LPCS/LPCI Manual Initiation. 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 would be in accordance with the SFCP. The NRC staff has determined that this is acceptable because it is consistent with the existing requirements for these Functions and is based upon operating experience that demonstrates channel failure is rare. In addition, this SR could be included as part of a refueling activity since, during refueling outages, periods in Modes 4 and 5 are often 30 days or less.

SR 3.3.5.2.3 would require a Logic System Functional Test and is only applied to the LPCS/LPCI manual initiation functions. The Logic System Functional Test is 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, and demonstrates the operability of the required manual initiation logic for a specific channel. The ECCS subsystem functional testing performed in proposed SRs 3.5.2.6 and 3.5.2.8 would overlap this surveillance to complete testing of the assumed safety function by actuating the required pumps and valves. The NRC staff has determined that this test is acceptable since it is consistent with the existing requirements for these functions.

The TSTF-542 did not include SRs to verify or adjust the instrument setpoint derived from the allowable value (AV) using a Channel Calibration or a surveillance to calibrate the trip unit. Since a draining event in Modes 4 or 5 is not an analyzed accident, there is no accident analysis on which to base the calculation of a setpoint. The purpose of the Functions is to allow ECCS manual initiation or to automatically isolate a penetration flow path, but no specific RPV water level is assumed for those actions. Therefore, the Mode 3 AV 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 since TS 3.3.5.1 and TS 3.3.6.1 continue to require the Functions to be calibrated on an established interval. Similarly, there are no accident analysis assumptions on response time because a draining event in Modes 4 or 5 is not an analyzed accident. The NRC staff has determined that the above approach is acceptable because it is adequate to ensure that the channel responds with the required pumping systems to inject water when needed and perform the necessary isolation functions when commanded.

The ECCS Response Time (NMP2 TS SR 3.5.1.8) and Isolation System Response Time (NMP2 TS SR 3.3.6.1.7) testing ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Proposed new TS 3.3.5.2 does not include SRs to participate in any ECCS Response Time testing and Isolation System Response Time testing. This is acceptable because the purpose of these tests is to ensure that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis, but a draining event in Modes 4 or 5 is not an analyzed accident and, therefore, there are no accident analysis assumptions on response time and there are alternate manual methods for achieving the safety function. A potential draining event in Modes 4 and 5 is a slower event than a LOCA. More significant protective actions are required as the calculated drain time decreases.

Based on the above, the NRC staff concludes that the proposed SRs of LCO 3.3.5.2 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 and are, therefore, acceptable.

3.2.4 Staff Evaluation of Proposed Table 3.3.5.2-1, "RPV Water Inventory Control Instrumentation"

In order to support the requirements of proposed TS 3.5.2, the associated instrumentation requirements would be designated in Table 3.3.5.2-1. 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 3.3.5.2-1 specifies the instrumentation that shall be operable for each function in the table for 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 AV, and footnotes concerning items of the table.

Proposed Table TS 3.3.5.2-1 presents details on the functions required to support the equipment and functions of TS 3.5.2. The NRC staff has determined that the presentation in this table is acceptable, because this section 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., A, B, C) if the function is inoperable, the applicable SRs, the selection of the AV, and justification of differences between the existing and proposed TS functions. This RPV Water Inventory Control Instrumentation set is acceptable, because it is adequate to ensure that the instruments of the channels respond with the required accuracy permitting pump systems to operate to inject water when needed and isolating equipment when commanded to support the prevention of or to mitigate a potential RPV draining event.

Each of the ECCS subsystems in Modes 4 and 5 can be started by manual alignment of a small number of components or initiated by LPCS/LPCI manual pushbutton. Automatic initiation of an ECCS injection/spray subsystem may be undesirable because it could lead to overflowing the RPV cavity, due to injection rates of thousands of gallons per minute. Thus, there is adequate time to take manual actions (e.g., hours versus minutes). Considering the action statements as the drain time decreases (the proposed TS 3.5.2, Action E, prohibits plant conditions that could result in drain times less than 1 hour), there is sufficient time for the reactor operators to take manual action to stop the draining event, and to manually start an ECCS injection/spray subsystem or additional method of water injection as needed. Consequently, there is no need for automatic initiation of ECCS to respond to an unexpected draining event. The NRC staff has determined that this to be acceptable because a draining event is a slow evolution when compared to a design basis LOCA assumed to occur at a significant power level.

3.2.4.1 Staff Evaluation of Proposed Table 3.3.5.2-1 Functions

For the Table 3.3.5.2-1 Functions 1.a, 1.b and 2.a, LPCS and LPCI Differential Pressure – Low (Injection Permissive), these signals would be used as a permissive and protection for these 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 pressure is expected to virtually always be below the ECCS maximum design pumping pressure during Modes 4 and 5, the Reactor Pressure - Low signals are required to be operable to permit manual initiation of the ECCS equipment to inject water into the vessel if needed. The proposed AV for LPCS would be $\geq$ 40 pounds per square inch differential (psid) and $\leq$ 98 psid, and for LPCI A, B, and C would be $\geq$ 70 psid and $\leq$ 150 psid. One required channel per Function is required, as it is currently in NMP2 TS

Table 3.3.5.1-1 for proposed Functions 1.a and 1.b. By letter dated November 3, 2017 (Reference 2), the required channels per function for Function 2.a in Table 3.3.5.2-1 was revised to "1" consistent with TSTF-542, Revision 2.

For the Table 3.3.5.2-1 Functions 1.c, 1.d, and 2.b, LPCS and LPCI Discharge Flow - Low (Bypass), these minimum flow instruments are provided to protect the associated low pressure ECCS pumps from overheating when the pump is operating and the associated injection valve is not fully open. One differential pressure switch per ECCS pump is used to detect the associated subsystems' flow rates. The logic is arranged such that each transmitter causes its associated minimum flow valve to open. The logic will close the minimum flow valve once the closure setpoint is exceeded. The LPCI minimum flow valves are time delayed such that the valves will not open for 8 seconds after the switches detect low flow. This time delay is acceptable because it is provided to limit reactor vessel inventory loss during the startup of the RHR shutdown cooling mode. The proposed AV for the LPCS system would be ≥ 1000 gallons per minute (gpm) and ≤ 1440 gpm. The proposed AV for the LPCI system would be ≥ 770 gpm and ≤ 930 gpm. For both systems, there would be one required instrument channel per pump. Reference 2 includes the licensee's response stating that the required channels per function for Function 1.d in Table 3.3.5.2-1 is revised to "1 per pump" consistent with TSTF-542, Revision 2.

For the Table 3.3.5.2-1 Functions 1.e and 2.c, LPCS and LPCI Manual Initiation, the manual initiation switch and push button channels introduce signals into the appropriate ECCS logic to provide manual initiation capability and are redundant to the automatic protective instrumentation. There is one switch and push button (with two channels per switch and push button) for each of the two divisions of low pressure ECCS (i.e., Division 1 ECCS, LPCS, and LPCI A; Division 2 ECCS, LPCI B, and LPCI C). The only time the manual initiation function is required to be OPERABLE is that associated with the ECCS subsystem required to be OPERABLE by LCO 3.5.2. Since the channels are mechanically actuated based solely on the position of the pushbuttons, the AV for this function is "N/A." Each channel of the Manual Initiation Function (1 per subsystem) is only required to be OPERABLE when the associated ECCS is required to be OPERABLE.

For the Table 3.3.5.2-1 Function 3.a, HPCS Pump Suction Pressure – Low, this function, which is an indication of a low level in the CST, indicates the unavailability of an adequate supply of makeup water from this normal source. Normally the suction valves between HPCS and the CST are open and, upon receiving a HPCS initiation signal, water for HPCS injection would be taken from the CST. However, if the pump suction pressure (indicating low water level in the CST) falls below a preselected level for a preselected time, first the suppression pool suction valve automatically opens, and then the CST suction valve automatically closes. This ensures that an adequate supply of makeup water is available to the HPCS pump. To prevent losing suction to the pump, the suction valves are interlocked so that the suppression pool suction valve must be open before the CST suction valve automatically closes. The functions are implicitly assumed in the accident and transient analyses (which take credit for HPCS) since the analyses assume that the HPCS suction source is the suppression pool. While the Pump Suction Pressure - Low Function is provided to prevent spurious suction source automatic swaps, the AV of ≥ 94.5 inches water is low enough such that the automatic suction swap from the CST to the suppression pool will occur before adequate pump suction head is lost. One channel of the CST low level Function is only required to be OPERABLE when the associated ECCS is required to be OPERABLE. This is to ensure that no single instrument failure can preclude HPCS swap to the suppression pool.

For the Table 3.3.5.2-1 Function 3.b, HPCS Pump Discharge Pressure - High (Bypass), and Function 3.c, HPCS System Flow Rate - Low (Bypass)," the minimum flow instruments are provided to protect the HPCS pump from overheating when the pump is operating and the associated injection valve is not fully open. The minimum flow line valve is opened when low flow and high pump discharge pressure are sensed, and the valve is automatically closed when the flow rate is adequate to protect the pump or the discharge pressure is low (indicating the HPCS pump is not operating). By letter dated February 6, 2018 (Reference 5), the licensee proposed to delete Note (d) from Table 3.3.5.2-1, Function 3.b, and from the bottom of the table. Note (d) currently states:

> The injection function of Drywell Pressure-High and Manual Injection are not required to be OPERABLE with reactor steam dome pressure less than 600 psig.

The NRC Staff has determined that the licensee's proposed deletion of Note (d) is acceptable since the Note pertains to the Drywell Pressure-High function for Modes 4 and 5, which, by letter dated February 28, 2017 (Reference 1), NMP2 does not have this function for Modes 4 and 5. NMP2 does not have this function for Modes 1, 2, and 3 as specified in Table 3.3.5.1-1. The Note (d) also refers to Manual Injection function 3.e, which was deleted (Reference 4) and justified in Variation 8, Section 3.5.8 of the SE.

For HPCS high pressure function, the high allowance value is set high enough to ensure that the valve will not open when the pump is not operating. The existing AV is ≥ 220 pounds per square inch gauge (psig), however the current TS Table 3.3.5.1-1 required 1 channel per function would be changed to "1 per pump" as specified in TSTF-542.

For HPCS low flow function, the existing AV is ≥ 580 gpm and ≤ 720 gpm, however the current TS required 1 channel per function would be changed to '1 per pump' as specified in TSTF-542.

From Reference 1, for the Table 3.3.5.2-1, Function 3.e, HPCS System, Manual Initiation, this Function is deleted in Reference 3, as explained and evaluated in Variation 8 (Section 3.5.8 below).

For the Table 3.3.5.2-1 Function 4.a, RHR System Isolation, Reactor Vessel Water Level - Low, Level 3, the function is only required to be operable when automatic isolation of the associated RHR system penetration flow path is credited in calculating drain time. The definition of drain time allows crediting the closing of penetration flow paths that are capable of being automatically isolated by RPV water level isolation instrumentation prior to the RPV water level dropping below the TAF, however, if the instrument function is inoperable, a closed path cannot be credited, and a drain time calculation must be re-performed. The AV is ≥ 157.8 inches and the existing required channels per trip function is 2 and was previously found in NMP2 TS Table 3.3.5.2-1. The proposed AV remains at ≥ 157.8 inches and the proposed required channels per function remains 2 in one trip system.

For the Table 3.3.5.2-1 Function 5.a, RWCU System Isolation, Reactor Vessel Water Level - Low Low, Level 2, the function is only required to be operable when automatic isolation of the associated RWCU system penetration flow path is credited in calculating drain time. The definition of drain time allows crediting the closing of penetration flow paths that are capable of being automatically isolated by RPV water level isolation instrumentation prior to the RPV water level dropping below the TAF, but if the instrument function is inoperable, a closed path cannot be credited and a drain time calculation must be re-performed. This function is not applicable in Modes 4 or 5 in TS 3.3.6.1, it is however being added to TS 3.3.5.2 to support crediting the

automatic isolation of the RWCU system in calculating drain time. The number of required channels is two, which retains the requirement that the two instrument channels must be associated with the same trip system. Only one trip system is required to be operable to ensure that automatic isolation of one of the two isolation valves will occur on low reactor vessel water level. The AV of ≥ 101.8 inches was found to be the same as the Reactor Vessel Water Level - Low, Level 2 AV in other NMP2 TSs (i.e., Tables 3.3.6.1-1 and 3.3.7.1-1).

The NRC staff has determined that the proposed new LCO 3.3.5.2 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. This meets the requirements of 10 CFR 50.36(c)(2)(i) and, therefore, the staff has concluded that the licensee's proposed changes to LCO 3.3.5.2 are acceptable.

3.3 Staff Evaluation of TS 3.5.2 – Reactor Pressure Vessel Water Inventory Control

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 ECCS injection/spray subsystem shall be OPERABLE.

"One ECCS injection/spray subsystem" is defined as either one of the three LPCI subsystems (LPCI A, LPCI B, or LPCI C), one LPCS system, or one HPCS system. The LPCS system and each LPCI subsystem consists of one motor driven pump, piping, and valves to transfer water from the suppression pool to the RPV. The HPCS system consists of one motor driven pump, piping, and valves to transfer water from the suppression pool or CST 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 subsystems are to be considered operable during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable. Decay heat removal in Modes 4 and 5 is not affected by the proposed change as the requirements on the number of RHR SDC subsystems that must be operable and in operation to ensure adequate decay heat removal from the core are unchanged. These requirements can be found in the NMP2 TS 3.4.10, "Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown," TS 3.9.7, "Reactor Pressure Vessel (RPV) Water Level – New Fuel or Control Rods," TS 3.9.8, "Residual Heat Removal (RHR) – High Water Level," and TS 3.9.9, "Residual Heat Removal (RHR) – Low Water Level." Though NMP2 is a BWR/5 facility, it appears from the application that the NMP2 TSs are more aligned to BWR/6 STSs (NUREG-1434). These NMP2 decay heat removal requirements are similar to the STS and can be found in the NUREG-1434 (Revision 4), TS 3.4.10, "Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown," TS 3.9.7, "Reactor Pressure Vessel (RPV) Water Level – New Fuel or Control Rods," 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 has determined that the water sources provide reasonable assurance that the lowest functional capability required for safe operation is maintained and the safety limit is protected.

The proposed TS 3.5.2 LCO contains two parts. The first part states that DRAIN TIME of RPV WIC 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 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 low pressure ECCS injection/spray subsystem operability or DRAIN TIME.

The current TS LCO states that two ECCS injection/spray subsystems shall be operable, whereas the proposed LCO 3.5.2 states that only one ECCS injection/spray subsystem shall be operable. This change is reflected in Condition A. The change from two ECCS injection/spray subsystems to one ECCS injection/spray subsystem is because this redundancy is not required. With one ECCS injection/spray subsystem and non-safety 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, a method of water injection capable of operating without offsite electrical power should be established immediately. The proposed Condition B provides adequate assurance of an available water source should Condition A not be met within the 4-hour completion time.

The proposed Condition C states that for a drain time < 36 hours and ≥ 8 hours, to (C.1) verify secondary containment boundary is capable of being established in less than the drain time with a completion time 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 completion time 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 completion time of 4 hours. The current NMP2 and STS Condition C states that if two ECCS injection/spray subsystems are inoperable, then restore one to operable status within 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 for a 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, and (D.2) immediately initiate action to establish 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 required action Condition B. The current NMP2 TSs for Condition D are similar to those proposed for when Required Action C.2 is not met. The proposed Condition D provides adequate protection should the drain time be < 8 hours because of 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 operations.

The proposed Condition E states that when the required action and associated completion time of Condition C or D is not met, or the drain time is < 1 hour, then initiate action to restore drain time to ≥ 36 hours, immediately. The proposed Condition E is new, as it is not present in the current NMP2 TSs or STS. The proposed Condition E is acceptable because it provides the necessary step to restore the 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. The NRC staff concludes that 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, they are acceptable.

3.3.1 Staff Evaluation of Proposed TS 3.5.2 Surveillance Requirements

The proposed TS 3.5.2 SRs include (1) verification of drain time (SR 3.5.2.1), (2) verification of water levels/volumes that support the LPCS system and the LPCI injection subsystems (SR 3.5.2.2), (3) verification of water levels/volumes that support the HPCS system (SR 3.5.2.3), (4) verification of water filled pipes to preclude water hammer events (SR 3.5.2.4), (5) verification of correct valve positions for the required ECCS injection/spray subsystem (SR 3.5.2.5), (6) verification of operations of ECCS injection/spray systems in the recirculation line (SR 3.5.2.6), (7) verification of valves credited for automatic isolation actuated to the isolation position (SR 3.5.2.7), and (8) verification that the required LPCI or LPCS subsystem actuates on a manual initiation signal or the required HPCS subsystem can be manually operated (SR 3.5.2.8). Each of the eight SRs are described below.

SR 3.5.2.1 The drain time would be determined or calculated, and required to be verified to be ≥ 36 hours in accordance with the SFCP. 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.

SR 3.5.2.2 The suppression pool water level (≥195 ft) for a required low pressure ECCS injection/spray subsystem is required to be verified to ensure pump net positive suction head and vortex prevention is available for the LPCI/LPCS subsystem required to be operable by the LCO. Indications are available either locally or in the control room regarding suppression pool water level. This surveillance would be required to be performed in accordance with the SFCP.

SR 3.5.2.3 The suppression pool water level (≥195 ft) or condensate storage tank B water level (≥ 26.9 ft) for a required HPCS system is required to be verified to ensure pump net positive

suppression pool water level and condensate storage tank B level. This surveillance would be required to be performed in accordance with the SFCP.

SR 3.5.2.4 The SR to verify that 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 ECCS injection/spray subsystem to be operable instead of two ECCS subsystems. The SR 3.5.2.4 wording would change from "Verify, for each required ECCS..." to "Verify, for the required ECCS...." This change clarifies the requirement to maintain consistency with the proposed LCO. Maintaining the pump discharge lines of the required ECCS injection/spray subsystem sufficiently filled with water ensures that the ECCS subsystem will perform properly. One acceptable method of ensuring that the lines are filled with water is to vent at the high points. This surveillance would be required to be performed in accordance with the SFCP.

SR 3.5.2.5 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 3.5.2.4, changes to SR 3.5.2.5 would clarify a proposed requirement for LCO 3.5.2. The proposed SR wording, "Verify, for the required ECCS..." would replace "Verify each required ECCS...." SR 3.5.2.4 would provide assurance that the proper flow path will be available for ECCS operation to support TS 3.5.2. This SR would not apply to valves that are locked, sealed, or otherwise secured in position, since these valves would be verified to be in the correct position prior to locking, sealing, or securing. This surveillance would be required to be performed in accordance with the SFCP.

A note is maintained from the existing SR 3.5.2.4, which states "Not required to be met for system vent flow paths opened under administrative controls." The Note exempts system vent flow paths opened under administrative control. The administrative control includes stationing a dedicated individual at the system vent flow path who is in continuous communication with the control room. This individual will have a method to rapidly close the system vent flow path if directed.

SR 3.5.2.6 The required ECCS injection/spray subsystem would be required to be operated through its recirculation line for ≥ 10 minutes in accordance with the SFCP. This would demonstrate that the subsystem is capable for operation to support TS 3.5.2. Testing the ECCS injection/spray subsystem through the recirculation line is necessary to avoid overfilling the refueling cavity. The minimum operating time of 10 minutes is based on engineering judgement.

The new SR 3.5.2.6 note, which states "Not required to be met for ECCS pumps aligned for shutdown cooling," is further described in Section 3.5.8 of this SE.

SR 3.5.2.7 Verification that each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated RPV water level isolation signal is 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 in accordance with the SFCP.

SR 3.5.2.8 This SR would state, "Verify the required LPCI or LPCS subsystem actuates on a manual initiation signal or the required HPCS subsystem can be manually operated." It would demonstrate that the required ECCS subsystem could be manually initiated to provide additional RPV water inventory, if needed. The HPCS pump has the capability to be manually started at

NMP2 and to open the HPCS injection valve if needed (for details, refer to SE Section 3.5.7). By operating the associated pump and valve switches which operate all active components, water flow can be demonstrated by recirculation through the test line. Vessel injection/spray may be excluded from the SR, per the existing Note. This surveillance would be required to be performed in accordance with the SFCP.

The NRC staff evaluated each of these proposed SRs associate 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 NRC staff determined 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 surveillance requirements 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

LCO 3.3.5.1 currently states, "The ECCS instrumentation for each Function in Table 3.3.5.1-1 shall be OPERABLE," with the applicability as stated in the table. Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation," currently contains requirements for operability of certain functions during Modes 4 and 5 when the associated ECCS subsystem(s) are required to be operable per LCO 3.5.2, "ECCS – Shutdown."

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

FUNCTION	FUNCTION DELETED	FUNCTION RELOCATED TO TABLE 3.3.5.2-1
1. Low Pressure Coolant Injection - A (LPCI) and Low Pressure Core Spray (LPCS) Subsystems		
a. Reactor Vessel Water Level – Low, Level 3	Yes	
b. Reactor Vessel Water Level – Low Low Low, Level 1	Yes	
e. LPCS Pump Start – Time Delay Relay (Normal Power)	Yes	
f. LPCI Pump A Start – Time Delay Relay (Normal Power)	Yes	
g. LPCS Pump Start – Time Delay Relay (Emergency Power)	Yes	
h. LPCI Pump A Start – Time Delay Relay (Emergency Power)	Yes	
i. LPCS Differential Pressure – Low (Injection Permissive)		Function 1.a
j. LPCI A Differential Pressure – Low (Injection Permissive)		Function 1.b
k. LPCS Pump Discharge Flow — Low (Bypass)		Function 1.c
l. LPCI Pump A Discharge Flow — Low (Bypass)		Function 1.d
m. Manual initiation		Function 1.e
2. LPCI B and LPCI C Subsystems		

a. Reactor Vessel Water Level – Low, Level 3	Yes	
b. Reactor Vessel Water Level - Low Low Low, Level 1	Yes	
e LPCI Pump B Start - Time Delay Relay (Normal Power)	Yes	
f LPCI Pump C Start - Time Delay Relay (Normal Power)	Yes	
g. LPCI Pump B Start – Time Delay Relay (Emergency Power)	Yes	
h. LPCI Pump C Start – Time Delay Relay (Emergency Power)	Yes	
i. LPCI B and C Differential Pressure – Low (Injection Permissive)		Function 2.a
j. LPCI Pump B and LPCI Pump C Discharge Flow – Low (Bypass)		Function 2.b
k. Manual initiation		Function 2.c
3. High Pressure Core Spray (HPCS) System		
a. Reactor Vessel Water Level - Low Low, Level 2	Yes	
c. Reactor Vessel Water Level – High, Level 8	Yes	
d. Pump Suction Pressure – Low		Function 3.a
e. Pump Suction Pressure - Timer	Yes	
g. HPCS Pump Discharge Pressure – High (Bypass)		Function 3.b
h. HPCS System Flow Rate – Low (Bypass)		Function 3.c
i. Manual Initiation	Yes	

As shown in the table above, 16 Functions would be deleted to support the consolidation of the RPV WIC Instrumentation requirements into proposed TS 3.3.5.2. The other 11 Functions would be moved to proposed TS Table 3.3.5.2-1 as discussed in Section 3.2.4.1 of this SE.

The NMP2 TSs currently require 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 determined that it is acceptable to delete TS Table 3.3.5.1-1 Functions 1.a, 1.b, 2.a, 2.b, and 3.a (either low reactor vessel water Levels 1, 2, or 3) because manual ECCS initiation is preferred over automatic initiation during Modes 4 and 5, and the operator would be able to use other, more appropriately sized pumps if needed to mitigate a draining event. In addition, the NRC staff determined that it is acceptable to delete TS Table 3.3.5.1-1, Functions 1.e, 1.f, 1.g,1.h, 2.e., 2.f., 2.g, and 2.h, for the LPCS/LPCI A, B, and C pump start time delay relays. The purpose of these time delays is to stagger the automatic start of ECCS pumps thus limiting the starting transients on the emergency buses. The staggered starting of ECCS pumps is unnecessary for manual ECCS operation. HPCS Function 3.e. pump suction pressure – timer, which prevents spurious suction source automatic swaps from the CST to the suppression pool, is not needed to support drain time.

The deletion of Functions regarding HPCS manual initiation and HPCS reactor vessel water – high, level 8 are evaluated in Variation 8 in Section 3.5.8 of this SE.

3.5 Staff Evaluation of NMP2 Plant-Specific TSTF-542 TS Variations

Section 2.2.5 above lists the licensee's proposed 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 (Reference 1) 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, TS Section 3.3.5.1 Surveillance Requirements Note 2

The Note 2 preceding the TS Section 3.3.5.1 SRs is clarified to state that actions may be delayed for up to 6 hours. The listing of the specific Functions 3.e, 3.g, 3.h, and 3.i is no longer necessary due to the implementation of TSTF-542. Note 2 is in the current NMP2 TS and was implemented during the original conversion to the Improved STS for NMP2.

Existing SR Note 2 states:

> 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 as follows: (a) for up to 6 hours for Functions 3.e, 3.g, 3.h, and 3.i; and (b) for up to 6 hours for Functions other than 3.e, 3.g, 3.h, and 3.i, provided the associated Function or the redundant Function maintains ECCS initiation capability.

Proposed SR Note 2 would state:

> 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 or the redundant Function maintains ECCS initiation capability.

The NRC staff determined that the TS Table 3.3.5.1 HPCS Functions 3.e, 3.g, 3.h, and 3.i, are no longer needed to be an exception. This Note is based on reliability analyses assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6-hour testing allowance does not significantly reduce the probability that the ECCS will initiate when necessary; therefore, the NRC staff concludes that the licensee's proposed Variation 1 is acceptable.

3.5.2 Variation 2, TS Table 3.3.5.1-1, LPCS/LPCI Reactor Vessel Water Level Low, Level 3 and Drywell Pressure Functions

The ECCS Instrumentation for NMP2 includes Functions 1.a, 2.a., "Reactor Vessel Water Level - Low, Level 3," and 1.d, 2.d, "Drywall Pressure - High (Boundary Isolation)," to isolate RHR boundary valves and ensure injection of water into the reactor vessel, as described in the current NMP2 TS Bases.

The TSTF-542 Functions 1.a and 1.b align to NMP2 Functions 1.b and 1.c, respectively, for LPCS and LPCI-A. The TSTF-542 Functions 2.a and 2.b align to NMP2 Functions 2.b and 2.c, respectively, for LPCI-B and LPCI-C.

The NRC staff determined that the differences between the STS and the NMP2 LPCS/LPCI RPV Water Level Low, Level 3 and Drywell Pressure Functions are acceptable. The low pressure ECCS and associated diesel generators are initiated at Level 1 and certain RHR valves are closed at Level 3 to ensure that core spray and flooding functions are available to prevent or minimize fuel damage. Certain RHR valves are closed upon receipt of the Drywell Pressure - High (Boundary Isolation) Function in order to minimize the possibility of fuel damage. The applicability of these Functions is modified and Modes 4 and 5 are removed to align with the intent of TSTF-542. Therefore, the NRC staff concludes that the licensee's proposed Variation 2 is acceptable.

3.5.3 Variation 3, TS Table 3.3.5.1-1, LPCS and LPCI Time Delay Relays

The TSTF-542, TS Table 3.3.5.1-1, Function 1.c, "LPCI Pump A Start - Time Delay Relay," aligns with the NMP2 Function 1.f, and is clarified as "(Normal Power)." The existing Functions 1.e, "LPCS Pump Start - Time Delay Relay (Normal Power)," 1.g, "LPCS Pump Start - Time Delay Relay (Emergency Power)," and 1.h, "LPCI Pump A Start - Time Delay Relay (Emergency Power)," are retained to accommodate existing NMP2 instrumentation.

The TSTF-542, TS Table 3.3.5.1-1, Function 2.c, "LPCI Pump B Start - Time Delay Relay," aligns with the NMP2 Function 2.e, and is clarified as "(Normal Power)." The existing NMP2 Functions 2.f, "LPCI Pump C Start - Time Delay Relay (Normal Power)," 2.g, "LPCI Pump B Start - Time Delay Relay (Emergency Power)," and 2.h, "LPCI Pump C Start - Time Delay Relay (Emergency Power)," are retained to accommodate existing NMP2 Instrumentation.

The Pump Start - Time Delay Relays (Normal and Emergency Power) are assumed to be operable in the accident and transient analyses requiring ECCS initiation. The applicability of these Functions is modified and Modes 4 and 5 are removed to align with the intent of TSTF-542.

The NRC staff determined that the deletion of TS Table 3.3.5.1-1 Functions related to the ECCS Pump Start Time Delays Relays, as shown above in Section 3.4, is acceptable. The purpose of these time delays is to stagger the automatic start of LPCS/LPCI pumps thus limiting the starting transients on the emergency buses. The staggered starting of ECCS pumps is unnecessary for manual ECCS operation. Therefore, the NRC staff concludes that the licensee's proposed Variation 3 is acceptable.

3.5.4 Variation 4, TS Tables 3.3.5.1-1 and 3.3.5.2-1, LPCS and LPCI Reactor Dome Pressure (Injection Permissive)

Table 3.3.5.1-1:

The TSTF-542, TS Table 3.3.5.1-1, Function 1.d, "Reactor Steam Dome Pressure - Low (Injection Permissive)," is modified to align with the NMP2 instrumentation for Injection Permissive using 1.i, "LPCS Differential Pressure - Low (Injection Permissive)," and 1.j, "LPCI A and LPCS Differential Pressure - Low (Injection Permissive)." Low differential pressure signals across the injection valves are used as permissives for the low pressure ECCS subsystems. The applicability of these Functions is modified and Modes 4 and 5 are removed to align with the intent of TSTF-542.

The TSTF-542, TS Table 3.3.5.1-1, Function 2.d, "Reactor Steam Dome Pressure - Low (Injection Permissive)," is modified to align with the NMP2 instrumentation for Injection

Permissive using 2.i, "LPCI B and C Differential Pressure - Low (Injection Permissive)." Low differential pressure signals across the injection valves are used as permissives for the low pressure ECCS subsystems. The applicability of this function is modified and Modes 4 and 5 are removed to align with the intent of TSTF-542. The REQUIRED CHANNELS PER FUNCTION is modified to be "1" (Reference 2).

Table 3.3.5.2-1:

The TSTF-542, TS Table 3.3.5.2-1, Function 1.a, "Reactor Steam Dome Pressure - Low (Injection Permissive)," is modified to align with the NMP2 instrumentation for Injection Permissive using 1.a, "LPCS Differential Pressure - Low (Injection Permissive)," and 1.b, "LPCI A Differential Pressure - Low (Injection Permissive)."

The TSTF-542, TS Table 3.3.5.2-1, Function 2.a, "Reactor Steam Dome Pressure - Low (Injection Permissive)," is modified to align with the NMP2 instrumentation for Injection Permissive and is renamed as 2.a, "LPCI B and C Differential Pressure – Low (Injection Permissive)."

The NRC staff determined that the differences between the STS and NMP2 permissives are acceptable since using either Reactor Steam Dome Pressure (STS) or Differential Pressure (NMP2) performs the same permissive function. As stated in Section 3.4 of this SE, proposed Table 3.3.5.2-1 adds the LPCS, LPCI-A, and LPCI-B/LPCI-C Differential Pressure Functions as Functions as 1.a, 1.b, and 2.a, respectively. This function ensures that, prior to opening the injection valves of the low pressure ECCS subsystems, the reactor pressure has fallen to a value below these subsystems' maximum design pressure. Therefore, the NRC staff concludes that the licensee's proposed Variation 4 is acceptable.

3.5.5 Variation 5, TS Table 3.3.5.1-1, HPCS and Condensate Storage Tank Level

The TSTF-542, TS Table 3.3.5.1-1, Function 3.d, "Condensate Storage Tank Level – Low," is modified to align with the NMP2 instrumentation for 3.d, "Pump Suction Pressure - Low," and 3.e, "Pump Suction Pressure - Timer." Low pump suction pressure, which is an indication of low level in the CST, indicates the unavailability of an adequate supply of makeup water from this normal source. The applicability of these Functions is modified and Modes 4 and 5 are removed to align with the intent of TSTF-542.

The NRC staff determined that the differences between the STS (CST water level) and the NMP2 TS (pump suction pressure) are acceptable since these functions perform the same purpose of ensuring HPCS suction valve transfer from an unavailable water supply to a secondary water supply. Normally, the suction valves between the HPCS and the CST are open and, upon receiving an HPCS initiation signal, water for HPCS injection would be taken from the CST. However, if the pump suction pressure (indicating low water level in the CST) falls below a preselected level for a preselected time, first the suppression pool suction valve automatically opens, and then the CST suction valve automatically closes. This ensures that the HPCS will have an acceptable water source in the event that it is needed. Therefore, the NRC staff concludes that the licensee's proposed Variation 5 is acceptable.

3.5.6 Variation 6, TS Section 3.3.5.2 Surveillance Requirements Note 2

The Notes section preceding the SRs in proposed new TS Section 3.3.5.2 is clarified by adding a Note 2. This Note 2 is carried over from the current NMP2 TS from LCO 3.3.5.1 to align with the other changes in Section 3.3.5.2 created by implementing TSTF-542.

Note 2 would state:

> 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 or the redundant Function maintains ECCS initiation capability.

The NRC staff determined that Note 2 is part of the licensee's current licensing bases for TS SR 3.5.1 and that it is appropriate to include Note 2 in the proposed TS SRs for 3.3.5.2. This Note is based on reliability analyses assumption of the average time required to perform channel surveillance. Upon completion of the SR, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the ECCS will initiate when necessary. Therefore, the NRC staff concludes that the licensee's proposed Variation 6 is acceptable.

3.5.7 Variation 7, SR 3.5.2.6 Note

The revised SR 3.5.2.6 is modified with a note to allow an ECCS pump that is already aligned for SDC to stay aligned and minimize the risk associated with realigning to minimum flow for 10 minutes and then manipulating the plant again to realign back to SDC mode.

The note would state:

> Not required to be met for ECCS pumps aligned for shutdown cooling.

The NRC staff determined that it is not necessary to realign an operating RHR system from SDC alignment, which is providing cooling flow to the core, to a recirculation alignment with flow from the suppression pool back to the suppression pool for pump flow verification. Operating in SDC provides this verification of RHR pump flow. The licensee's proposed change has no effect on the adoption of TSTF-542 and, therefore, the NRC staff concludes that the licensee's proposed Variation 7 is acceptable.

3.5.8 Variation 8, TS Table 3.3.5.2-1, HPCS Manual Initiation and Reactor Vessel Water Level – High, Level 8

Variation 8 is added based on References 3 and 4.

TS Table 3.3.5.2-1 is revised to reflect the NMP2 design. Function 3, "High Pressure Core Spray (HPCS) System," Function 3.a, "Reactor Vessel Water Level - High, Level 8," and Function 3.e, "Manual initiation," that appear in TSTF-542, are not included in the proposed TSs. This corrects an issue in TSTF-542 that affects the BWR/5 and BWR/6 ECCS instrumentation requirements.

The purpose of the manual initiation function is to allow manual actuation of the ECCS subsystem required by TS 3.5.2 to mitigate a draining event. The Reactor Vessel Water Level - High, Level 8 signal prevents overfilling of the reactor vessel into the main steam lines by closing the HPCS injection valves when the water level is above the Level 8 setpoint.

In addition to the deletion of the Functions noted above from TS Table 3.3.5.2-1, LCO 3.3.5.2, Condition E, is no longer necessary since the RPV Level 8 Function is deleted. Condition E states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	E.1 Declare HPCS system inoperable. AND E.2 Restore channel to Operable status	1 hour 24 hours

SR 3.5.2.8 is changed since the HPCS manual actuation is deleted. The proposed changes are:

> Verify the required LPCI or LPCS subsystem actuates on a manual initiation signal or the required HPCS subsystem can be manually operated.

The NRC staff determined that the manual initiation Functions and the HPCS Vessel Water Level 8 Function can be deleted. TS Table 3.3.5.2-1, Functions 3.a, and 3.e, as described in TSTF-542 (Function 3.f for Manual Initiation in Reference 1 was in error), are not needed to actuate the HPCS system components to mitigate a draining event. As previously stated in Section 3.3 of this SE, 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, but at undesirable flow rates in Modes 4 and 5 draindown events. Therefore, the NRC staff concludes that the licensee's proposed deletions of these manual initiation Functions and the revision to SR 3.5.2.8 is acceptable.

The NRC staff determined that TS 3.3.5.2, Condition E and Required Actions and Completion Times, which are associated with the HPCS Level 8 instrumentation, are no longer required and, therefore, their deletion is acceptable since the Level 8 function can be intentionally defeated, by procedure, to allow the HPCS injection valve to be opened, if needed to control inventory. Therefore, the NRC staff concludes that the licensee's proposed deletion of the Condition and associated Required Actions and Completion Times is acceptable.

3.6 Staff Evaluation of Proposed Deletion of References to OPDRVs

Section 2.2.4 above lists the NMP2 OPDRV references in the existing TSs proposed for deletion. The proposed TS changes would replace the existing specifications related to OPDRVs with revised specifications for RPV WIC. For example, the proposed changes would remove the terminology "operations with a potential for draining the reactor vessel," or "OPDRVs," and related concepts such as "Shutdown Cooling System integrity maintained," and Required Actions to "suspend OPDRVs."

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 attendant equipment operability requirements, Required Actions, and SRs and deleting references to OPDRVs throughout the TS.

The existing NMP2 TSs contain instrumentation requirements related to OPDRVs in the TS sections identified in SE Section 2.2.4. The proposed new TS 3.3.5.2 consolidates the instrumentation requirements into a single location to simplify the presentation and to provide requirements consistent with TS 3.5.2. The remaining TSs with OPDRV requirements are for containment, containment isolation valves, CREF System Instrumentation, Reactor Protection System Electric Power Monitoring – Logic, SGT System, Control Room Envelope Filtration (CREF) System, Control Room Envelope Air Conditioning (AC) System, and electrical sources. Each of these system's requirements during OPDRVs were proposed for consolidation into the proposed new TS 3.5.2 for RPV WIC based on the appropriate plant conditions and calculated drain time.

The NRC staff determined that the deletion of OPDRV 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 3.3.5.2, respectively, are a simplified alternative set of controls for ensuring water level is maintained above the TAF and, therefore, that these changes are acceptable.

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

The current NMP2 TS LCO 3.10.1, "System Leakage and Hydrostatic Testing Operation," allows performance of a system leakage or hydrostatic test with the average reactor coolant temperature greater than 200 °F, while considering operational conditions to still be in Mode 4, provided that certain secondary containment LCOs are met.

The TSTF-484, Revision 0, "Use of TS 3.10.1 for Scram Time Testing Activities," revised 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 a system leakage or hydrostatic test, or (2) as a consequence of maintaining adequate reactor pressure for control rod scram time testing initiated in conjunction with a system leakage or hydrostatic test.

By Amendment No. 121, dated February 7, 2008 (Reference 10), the NRC approved changes to NMP2 TS LCO 3.10.1 in accordance with TSTF-484. The NRC staff's SE for the subject amendment stated, in part, that:

> [T]wo low pressure [ECCS] injected/spray subsystems are required to be operable in Mode 4 by TS 3.5.2, "ECCS-Shutdown."

For NMP2, the ECCS network is composed of the HPCS System, the LPCS System, and the LPCI mode of the RHR System. However, per the proposed new LCO 3.5.2, which would replace the requirements of LCO 3.5.2, for the TSTF-542 LAR, 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 than is present during power operation and more than is present during most of an outage. 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 previously stated in Section 3.3 of this SE, with one ECCS injection/spray subsystem and non-safety related injection sources, 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.

After an additional review of Reference 8, the NRC staff determined that the LCOs 3.3.5.2 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

NMP2 Safety Limit 2.1.1.3 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 2.1.1.3 during Modes 4 and 5 operations.

During operation in Modes 4 and 5, the reactor coolant system is at a low operating temperature (≤ 200 °F) and is depressurized. An event involving a loss of inventory while in the shutdown condition is judged to not exceed the capacity of one ECCS subsystem. The accident that is postulated to occur during shutdown conditions, the fuel handling accident, does not involve a loss of inventory. The equipment and instrumentation associated with the RPV WIC TSs do not provide detection or mitigation related to this design-basis accident.

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 LCOs 3.5.2 and 3.3.5.2 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 proposed TS LCOs 3.5.2 and 3.3.5.2 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 determined 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 3.3.5.2, which contains the requirements for instrumentation necessary to support TS 3.5.2. Based on the considerations discussed above, the NRC staff has concluded that the proposed revisions are acceptable because they consolidate and clarify the RPV WIC requirements, which 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 TS Applicability, Condition descriptions, Required Actions, and table footnotes. The NRC staff reviewed the proposed changes and determined that the deletion of OPDRV 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 3.3.5.2, 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 3.3.5.2. The NRC staff determined that the proposed TS SRs for 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 via main control room push buttons for LPCS/LPCI or pumps and valves hand switches for HPCS. The NRC staff determined that the three SRs proposed for TS 3.3.5.2 are sufficient and adequate, because they are essential to 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 licensee's proposed SRs satisfy 10 CFR 50.36(c)(2)(ii) and 10 CFR 50.36(c)(3).

The NRC staff evaluated the proposed changes against each of the NMP2 applicable design requirements listed in Section 2.3 1 of this SE. The NRC staff determined that the proposed changes for Modes 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 general design criteria in that the NMP2 design requirements for instrumentation, reactor coolant leakage detection, the reactor coolant pressure boundary, 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 Attachment 4 to the application dated February 28, 2017. The NRC staff concludes that the TS Bases changes provided describe the basis for the affected TSs and follow the "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" (July 22, 1993; 58 FR 39132).

Additionally, the proposed TS changes were reviewed for technical clarity and consistency with the existing NMP2 requirements for customary terminology and formatting. The NRC staff concludes that the licensee's proposed changes are consistent with TSTF-542 and Chapter 16 of NUREG-0800, Revision 3 (Reference 8).

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the appropriate official for the State of New York was notified of the NRC's proposed issuance of the amendment on February 21, 2018. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and changes SRs. 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 (82 FR 19102, dated April 25, 2017), and there has been no public comment on such finding. 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.

1.0 REFERENCES

1. Letter from Exelon to NRC, "License Amendment Request – Revise Technical Specifications to Adopt TSTF-542, 'Reactor Pressure Vessel Water Inventory Control,' Revision 2," dated February 28, 2017 (ADAMS Accession No. ML17059C963).

2. Letter from Exelon to NRC, "Response to Request for Additional Information by the Office of Nuclear Reactor Regulation to Support Review of Nine Mile Point Nuclear Station, Unit 2, License Amendment Request to Adopt TSTF-542, Revision 2, Reactor Pressure Vessel Water Inventory Control," dated November 3, 2017 (ADAMS Accession No. ML17307A015).

3. Letter from Exelon to NRC, "Supplemental Information for Nine Mile Point Nuclear Station, Unit 2, to Adopt TSTF-542, 'Reactor Pressure Vessel Water Inventory Control,' Revision 2," dated December 27, 2017 (ADAMS Accession No. ML17363A215).

4. Letter from Exelon to NRC, "Supplemental Information No. 2 for Nine Mile Point Nuclear Station, Unit 2, to Adopt TSTF-542, 'Reactor Pressure Vessel Water Inventory Control,' Revision 2," dated January 12, 2018 (ADAMS Accession No. ML18012A361).

5. Letter from Exelon to NRC, "Supplemental Information No. 3 for Nine Mile Point Nuclear Station, Unit 2, to Adopt TSTF-542, 'Reactor Pressure Vessel Water Inventory Control,' Revision 2," dated February 6, 2018 (ADAMS Accession No. ML18037A131).

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

7. Letter from 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)," dated December 20, 2016 (ADAMS Accession No. ML16343B008).

8. NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Chapter 16, "Technical Specifications," dated March 2010 (ADAMS Accession No. ML100351425).

9. NUREG-1434, Revision 4.0, "Standard Technical Specifications - General Electric BWR/6 Plants," dated April 2012 (ADAMS Accession Nos. ML12104A195 and ML12104A196).

10. Letter from NRC to Nine Mile Point Nuclear Station, LLC, "Nine Mile Point Nuclear Station, Unit No. 2 - Issuance of Amendment Re: Technical Specification Change for Scram Time Testing Activities, Using the Consolidated Line Item Improvement Process (TAC No. MD6903)," dated February 7, 2008 (ADAMS Accession No. ML080180268).

11. Letter from Exelon to NRC, "Submittal of Revision 22 to the Nine Mile Point Unit 2 Updated Safety Analysis Report (USAR) and Reference Figures, 10 CFR 50.59 Evaluation Summary Report, Technical Specifications Bases Changes, and 10 CFR 54.37 Aging Management Review," dated October 24, 2016 (ADAMS Accession No. ML16309A376).

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Date: March 28, 2018

LIST OF ACRONYMS

AC	air conditioning
ADAMS	Agencywide Documents Access and Management System
BWR	boiling-water reactor
CFR	[Title 10 of the] *Code of Federal Regulations*
DID	defense-in-depth
ECCS	Emergency Core Cooling System
°F	degree Fahrenheit
GDC	general design criteria
gpm	gallons per minute
LAR	license amendment request
LCO	limiting condition for operation
LOCA	oss-of-coolant accident
LPCI	low pressure coolant injection
LPCS	low pressure core spray
OPDRVs	operations with potential for draining the reactor vessel
NRC	U.S. Nuclear Regulatory Commission
psig	pounds per square inch gauge
PCIV	primary containment isolation valve
RHR	residual heat removal
RPV	reactor pressure vessel
RWCU	reactor water clean up
SCIV	Secondary Containment Isolation valve
SDC	shutdown cooling
SE	Safety Evaluation
SFCP	Surveillance Frequency Control Program
SGT	Standby Gas Treatment
SR	Surveillance Requirement
SRP	Standard Review Plan
STS	standard technical specification
TAF	top of active fuel
TS	Technical Specification
TSTF	Technical Specifications Task Force
WIC	water inventory control

SUBJECT: NINE MILE POINT NUCLEAR STATION, UNIT 2 – ISSUANCE OF AMENDMENT NO. 168 TO REVISE TECHNICAL SPECIFICATIONS TO ADOPT TECHNICAL SPECIFICATIONS TASK FORCE TRAVELER TSTF-542, REVISION 2, "REACTOR PRESSURE VESSEL WATER INVENTORY CONTROL" (CAC NO. MF9357, EPID L-2017-LLA-0178) DATED MARCH 28, 2018

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