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U.S. Nuclear Regulatory Commission
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Nine Mile Point Nuclear Station, Unit 1
Renewed Facility Operating License No. DPR-63
NRC Docket No. 50-220

Subject: Response to Request for Additional Information by the Office of Nuclear Reactor Regulation to Support Review of Nine Mile Point Nuclear Station, Unit 1, License Amendment Request to Apply TSTF-542, Revision 2, Reactor Pressure Vessel Water Inventory Control

References:

1. Letter from J. Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request-Revise Technical Specifications to Apply TSTF-542, 'Reactor Pressure Vessel Water Inventory Control,' Revision 2," dated December 15, 2017

2. Email from M. Marshall (Senior Project Manager, U.S Nuclear Regulatory Commission) to R. Reynolds (Exelon), "Nine Mile Point, Unit 1-Request for Additional Information Regarding Reactor Pressure Vessel Water Inventory Control License Amendment request (L-2017-LLA-0426)," dated August 15, 2018

By letter dated December 15, 2017, (Reference 1) Exelon Generation Company, LLC (Exelon) requested to change The Nine Mile Point Unit 1 (NMP1) Technical Specifications (TS). The proposed amendment request would apply Technical Specification Task Force (TSTF)-542, Revision 2,"Reactor Pressure Vessel Water Inventory Control."

A public meeting was held on August 7, 2018, between Exelon and the NRC to Discuss the license amendment request to revise the NMP1 TS by replacing existing requirements related to "operations with a potential for draining the reactor vessel" with new requirements on reactor pressure vessel water inventory control with a focus on the proposed technical specifications mark-ups provided in Reference 1.

On August 15, 2018 (Reference 2) the U.S. Nuclear Regulatory Commission (NRC) identified areas where additional information was necessary to complete the review. A public meeting was held on September 13, 2018, to discuss the planned RAI response with the NRC Staff.

Attachment 1 to this letter contains the NRC's request for additional information immediately followed by Exelon's response. Attachment 2 to this letter contains the marked-up TS and Bases pages. Attachment 3 to this letter contains Supplemental Information to the original submittal including marked-up TS pages. The supplement revises the notes for Tables 3.6.2.k and 4.6.2k for High Pressure Coolant Injection to align with the changes implemented by TSTF-542. This Supplemental Information was discussed with the NRC during the public meeting held on September 13, 2018.

Exelon has reviewed the information supporting a finding of no significant hazards consideration and the environmental consideration provided to the NRC in Reference 1. The additional information provided in this response does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. Furthermore, the additional information provided in this response does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

There are no commitments contained in this response.

If you should have any questions regarding this submittal, please contact Ron Reynolds at 610-765-5247.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 1st day of October 2018.

James Barstow
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Attachment 1: Response to Request for Additional Information
Attachment 2: Revised Markup Pages
Attachment 3: Supplemental Information

cc:	USNRC Region I Regional Administrator	w/attachments
	USNRC Senior Resident Inspector – NMP	"
	USNRC Project Manager, NRR – NMP	"
	A. L. Peterson, NYSERDA	"

ATTACHMENT 1

Nine Mile Point Nuclear Station, Unit 1
Renewed Facility Operating License No. DPR-63
NRC Docket No. 50-220

Response to Request for Additional Information

RAI (1):

The licensee proposed to relocate the "Core Spray" functions from NMP1 TS Tables 3.6.2d and 4.6.2d to Proposed TS Marked-Up Tables 3.6.2m and 4.6.2m for the "Shutdown Condition - Cold and Refuel," which is similar to TSTF-542, Revision 2, Table 3.3.5.2. The Proposed TS Marked-Up Table 3.6.2m (LAR Attachment 2, page 247b) lists "Manual" as the only "Start Core Spray Pumps" parameter. In the current TS Table 3.6.2d, the "Start Core Spray Pumps" parameters include "High Drywell Pressure" and "Low-Low Reactor Water Level. In Section 2.2.5.1 of Attachment 1 to the LAR, the licensee stated:

> To start the Core Spray pumps, either Parameter (1) High Drywell Pressure or (2) Low-Low Reactor Water Level, is required. Additionally, Table 3.6.2d includes Parameter (3) Reactor Pressure to open the Core Spray discharge valves, in conjunction with one of either Core Spray Pump start Parameters. In alignment with TSTF-542, Revision 2, Proposed Safety Basis (Section 3.3.1), the High Drywell Pressure Parameter is not realistic in the Shutdown Condition – Cold and is not transferred to the new Table 3.6.2m/4.6.2m.

Additionally, on page 249a of the Proposed TS Bases Marked-Up the licensee described NMP 1's manual initiation instrumentation as follows:

> Manual initiation is available for scram, reactor isolation, and containment isolation. In order to manually initiate other systems, each pump and valve is independently initiated from the control room.

The NMP1 core spray system is one of the "other systems" described above. Based on this information, the NMP1 design does not align with design description for ECCS Manual Initiation in the related section of TSTF-542, Revision 2, bases for STS 3.3.5.2, "RPV Water Inventory Control Instrumentation," which assumes that an entire emergency core cooling system (ECCS) subsystem can be started with the press of one button.

Furthermore, TSTF-542 STS 3.3.5.2 Bases for Required Action D.1 states, in part:

> 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 inoperabilities.
>
> The Completion Time is appropriate given the ability to manually start the ECCS pumps and open the injection valves and to manually ensure the pump does not overheat.

a) Provide technical justification for not including the "Low-Low Reactor Water Level Parameter" under the "Start Core Spray Pumps" function in Proposed TS Marked-Up Tables 3.6.2m and 4.6.2m.

b) Since the NMP1 core spray design does not have channels that start an entire ECCS subsystem, as described in the TSTF-542, revision 2 bases for STS 3.3.5.2, provide technical justification for the "Manual" parameter under the "Start Core Spray Pumps" function in Proposed TS Marked-Up Tables 3.6.2m and 4.6.2m.

c) Since the NMP1 design does not have the capability to start an entire core spray subsystem with one button, the individual component controls for the pumps and valves would be the only method to inject water. Should any of those controls become inoperable, there would be no backup means to inject water using the associated required core spray subsystem, rendering it inoperable as well. Proposed NMP1 Note (d) to TS Tables 3.6.2m and 4.6.2m would allow the plant to remain in this condition, without injection capability, for up to 24 hours, which is a non-conservative TS action considering the assumptions described in the STS. Provide technical justification for why proposed Note (d) would be appropriate for the "Manual" parameter.

d) On Page 79a of the Proposed TS Marked-Up, Specification e of Surveillance Requirement 4.1.9 states, "Verify the required core spray subsystem actuates on a manual initiation signal, in accordance with the Surveillance Frequency Control Program." Considering that the NMP1 core spray design does not have manual initiation capability to start an entire subsystem with a manual initiation channel, please provide technical justification for Specification e.

e) On page 247b of the Proposed TS Mark-Up, the Table 3.6.2m parameter, "Reactor Pressure and (1) above," listed under Open Core Spray Discharge Valves has "1 per pump" in the columns for "Minimum No. of Tripped or Operable Trip Systems" and "Minimum No. of Operable Instrument Channels per Operable Trip System." This parameter originated from Table 3.6.2d, which has "2" in the same columns. This requirement is similar to the TSTF-542 standard technical specification (STS) Table 3.3.5.2-1 Function 1.a, Core Spray - Reactor Steam Dome Pressure - Low (Injection Permissive). This function's mode 4 and 5 requirements were moved from STS Table 3.3.5.1-1 Function 1.c; the same number of required channels per function were maintained in Table 3.3.5.2-1.

   The LAR includes technical justifications for several variations from TSTF-542, Revision 2, but the LAR does not include a technical justification for this variation. Provide technical justification for this variation.

f) Since the NMP1 design has no backup to the manual core spray function to inject water should the individual component controls become inoperable, the application of the equivalent to STS 3.3.5.2 Condition D in NMP1 TS Tables 3.6.2m and 4.6.2m, Note (d), appears to be a non-conservative action, which could allow the plant to be without injection

capability via its required ECCS subsystem for up to 24 hours. Please provide technical justification for why Note (d) would be appropriate for the "Manual" parameter.

Exelon Response to RAI (1)

a) The NMP1 Core Spray system is a low-pressure water injection system. The, "Low-Low Reactor Water Level Parameter," is not included under the, "Start Core Spray Pumps," function in the proposed TS Marked-up Tables 3.6.2m and 4.6.2m because it does not provide a start permissive signal for the Core Spray system. The permissive circuitry requirement to ensure flow to the reactor vessel is reactor pressure being less than 365 psig, for the, "Open Core Spray Discharge Valves," parameter. This allows for the Core Spray Discharge Valves to be opened. There are no interlocks or permissives preventing a Core Spray Pump or Core Spray Topping Pump from being started. This is a variation to TSTF-542 and is acceptable and revises the variation discussion in Section 2.2.5.1 of Reference 1.

b) The manual parameter for the NMP1 Start Core Spray pumps is removed from Tables 3.6.2.m and 4.6.2.m. The NMP1 design does not include a single button or switch to provide for a full system start. As a result of removing the Manual Parameter for Start Core Spray Pumps, the remaining parameter in Table 3.6.2m and 4.6.2m is reformatted by changing the number from (2) to (1) and deleting the conditional description, "and (1) above." This allows for the revised pages 247b and 247d to read correctly with Reactor Pressure as the required parameter. Additionally, this results in note (b) being removed from the Notes Table and on page 247b. All remaining notes are re-sequenced. Corresponding changes are made to the TS Bases (page 248a) and included in Attachment 2 for your information.

c) The current note (d) associated with the manual initiation is removed from Tables 3.6.2m and 4.6.2m. The remaining notes are re-sequenced and updated on Table 3.6.2m and 4.6.2m accordingly. The revised Tables 3.6.2m and 4.6.2m are provided in Attachment 2. Corresponding changes are made to the TS Bases (pages 249 and 249a) and included in Attachment 2 for your information.

d) Specification e of Surveillance Requirement 4.1.9 is removed from page 79b. See Attachment 2 for the revised Specification 3.1.9 and 4.1.9. As described in the response to RAI(1)(b) above, NMP1 does not have the manual initiation capability as described in TSTF-542, Rev 2.

e) The Table 3.6.2m, Parameter (2), is revised from 1 per pump to 2 for the Minimum No. of Tripped or Operable Trip Systems and for the Minimum No. of Operable Instrument Channels per Operable Trip System. This is consistent with TSTF-542, Rev 2 Table

3.3.5.2-1 Function 1.a Core Spray Reactor Steam Dome Pressure – Low (Injection Permissive). The revised Table 3.6.2m and 4.6.2m is provided in Attachment 2.

f) The note (d) associated with the Minimum No. of Operable Instrument Channels per Operable Trip System for Parameter (1), Manual, for Start Core Spray pumps is removed from Table 3.6.2m on page 247b. The remaining notes are re-sequenced and updated on Table 3.6.2m and 4.6.2m accordingly. This Parameter is removed from Table 4.6.2m as described in the response to RAI (1) (b). The revised Table 3.6.2m is provided in Attachment 2.

RAI (2):

Proposed TS Marked-Up Table 4.6.2m includes a "Start Core Spray Pumps, Manual" parameter. This parameter includes surveillance requirements for sensor check, instrument channel test, and instrument channel calibration. While the instrument channel test appears to be equivalent to the TSTF-542, Revision 2, surveillance requirement (SR) 3.3.5.2.2, Channel Functional Test. It is not clear why the sensor check and instrument channel calibration SRs are included for the "Manual" parameter. TSTF-542, Revision 2 includes only SR 3.3.5.2.2 for the equivalent "Core Spray System, Manual" parameter. The LAR includes technical justifications for several variations from TSTF-542, Revision 2, but the LAR does not include a technical justification for this variation.

a) Provide technical justification for including the "Manual" parameter.

b) Provide technical justification for the variation from TSTF-542, Revision 2 described for the "Start Core Spray Pump, Manual" parameter's SRs.

Exelon Response to RAI (2)

The "Start Core Spray Pumps, Manual" parameter and the associated SRs are removed from Table 3 4.6.2.m. This change is discussed in the responses to RAI (1)(a) and RAI (1)(b) above. The marked-up Table 4.6.2m is provided in Attachment 2.

RAI (3):

The Proposed TS Marked-Up Table 4.6.2m "Open Spray Core Discharge Valves Reactor Pressure" parameter includes SRs for a sensor check, instrument channel test, and an instrument channel calibration. This parameter is proposed to have its "Shutdown Condition – Cold and Refuel" mode applicability relocated to TS Tables 3.6.2m and 4.6.2m from TS Tables 3.6.2d and 4.6.2d. In the current TS tables, this parameter does not include a sensor check SR.

Provide justification for why a sensor check surveillance requirement was proposed for this parameter in Proposed TS Marked-Up Table 4.6.2m.

Exelon Response to RAI (3)

The sensor check surveillance requirement for the Proposed TS Marked-Up Table 4.6.2m "Open Spray Core Discharge Valves Reactor Pressure" parameter is deleted to be consistent with the existing surveillance requirements in Table 4.6.2d, which is the basis for the new Table 4.6.2m. This change is consistent with TSTF-542, Rev 2. The marked-up Table 4.6.2m is provided in Attachment 2.

RAI (4):

The licensee proposed NMP1 TS Marked-Up Tables 3.6.2m and 4.6.2m to capture the TSTF-542, Revision 2, RPVWIC instrumentation requirements. The notes for these proposed tables are similar to the TSTF-542, Revision 2 STS 3.3.5.2 conditions, required actions, and completion times. Specifically, proposed NMP1 Marked-Up Tables 3.6.2m and 4.6.2m notes (d) and (e) are similar to TSTF-542, Revision 2, STS 3.3.5.2 Conditions D and E, respectively. The LAR describes the variations from TSTF-542, Revision 2. However, the application does not contain an explanation for how the equivalents to Conditions A, B, and C in TSTF-542, Revision 2 STS 3.3.5.2 were incorporated. The LAR includes technical justifications for several variations from TSTF-542, Revision 2, but the LAR does not include a technical justification for this variation.

Provide justification for the variation from the TSTF-542, Revision 2 conditions, required actions, and completion times.

Exelon Response to RAI (4)

The proposed revision to the NMP1 TS Tables 3.6.2m and 4.6.2m are structured in the NMP1 custom technical specification format.

STS 3.3.5.2, Condition A requires entering the condition referenced in Table 3.3.5.2-1 for the channel. To be consistent with the NMP1 custom technical specification format, the notes in Table 3.6.2m and 4.6.2m have been modified to include the requirements of Condition B and C, described below. This variation is acceptable.

STS 3.3.5.2, Condition B is associated with vessel isolation and requires declaring associated penetration flow path(s) incapable of automatic isolation and calculating drain time. A note (g) has been added for Tables 3.6.2m and 4.6.2m on page 247h to perform this action. This is consistent with the format of the NMP1 custom technical specifications and is an acceptable variation. The marked-up page 247h is provided in Attachment 2.

STS 3.3.5.2, Condition C requires placing the instrument channel into trip, with a 1-hour completion time, and is associated with the water injection functions. A note (h) has been added to Notes for Tables 3.6.2m and 4.6.2m on page 247h to include this requirement. This is an acceptable variation. The marked-up page 247h is provided in Attachment 2.

RAI (5):

The LAR for NMP1 proposed that Surveillance Requirements Sensor Check, Instrument Channel Test, and Instrument Channel Calibration are to be included in Proposed TS Marked-Up 3.6.2m and 4.6.2m. These SRs differ from the STS SR wording in the equivalent section, TSTF-542, Revision 2 STS 3.3.5.2, of channel check, channel functional test, and logic system functional test. The NMP1 definitions for sensor checks and instrument channel tests are similar to the STS definitions for channel checks and channel functional tests, respectively. However, the NMP1 definition for an instrument channel calibration does not align with the STS definition for a logic system functional test; it is similar to the STS definition for a channel calibration. The LAR includes technical justifications for several variations from TSTF-542, Revision 2, but the LAR does not include technical justifications for these variations.

Please provide technical justification for the following variations from TSTF-542, Revision 2 in NMP1 Proposed TS Marked-Up Tables 3.6.2m and 4.6.2m:

a) inclusion of an Instrument Channel Calibration SR, and

b) omission of an equivalent to the TSTF-542, Revision 2 STS SR 3.3.5.2.3, "Logic System Functional Test."

Exelon Response to RAI (5)

The current NMP1 Custom Technical Specifications do not include Logic System Functional Tests as a requirement; therefore, the Logic System Functional Test SR was not included in the TSTF-542 submittal dated December 15, 2017. The SRs used are consistent with the current NMP1 Custom Technical Specification requirements. The Instrument Channel Calibration is the method used to ensure the circuitry performs as designed and the function is performed. The terminology used in the proposed TS change is consistent with the current NMP1 TS and the testing requirements in the NMP1 license basis. This variation is acceptable and supplements the discussion in Section 2.2.5.1 of Reference 1.

RAI (6):

In the LAR, the interrelationship between some related specifications in the Proposed TS Marked-Up is unclear. For example, in Tables 3.6.2m and 4.6.2m, there are several table notes that state, "...take the ACTION required by Specification 3.6.2a for that Parameter." However, under Specification a of LCO 3.6.2 in the Proposed TS Marked-Up, the actions would require entering the appropriate actions for inoperable core spray subsystems under LCO 3.1.4, which is only applicable during the "Power Operating Condition or Shutdown Condition – Hot," instead of LCO 3.1.9, which would apply when the reactor coolant temperature is less than or equal to 212 degrees Fahrenheit.

Verify the references related specifications are "linked" to the appropriate specification.

Exelon Response to RAI (6)

When directed to enter Specification 3.6.2a, Sub-Section (13) of 3.6.2a applies because Sub-Section (13) is for RPV WIC and directs the operator to Specification 3.1.9 for actions. The Notes for Tables 3.6.2m and 4.6.2m are revised to reference LCO 3.6.2.a(13). The marked-up Notes for Tables 3.6.2m and 4.6.2m are provided in Attachment 2.

RAI (7):

Section 2.2.5.1 of Attachment 1 to the LAR states, in part, "The applicability in the Refuel position of the mode switch is removed from Table 3.6.2d, for the Parameters Start Core Spray Pumps and Open Core Spray Discharge Valves." This statement is inconsistent with the Proposed TS Mark-Up for Table 3.6.2d. The Refuel column still contains an "x" for each, indicating applicability.

Clarify whether the applicability in the refuel position of the mode switch is or is not being removed from Proposed TS Mark-Up Table 3.6.2d.

Exelon Response to RAI (7)

The NMP1 design requires the mode switch to be in the "Refuel" position to withdraw control rods for scram time testing during the Reactor Pressure Vessel pressure testing. The Reactor Manual Control System is de-energized when the mode switch is in the "Shutdown" position. The applicability of these parameters is modified with note (h) added to page 219 stating the parameters are required when Reactor Coolant Temperature is greater than 212 degrees F. A reference to Note (h) is added to Table 3.6.2d under the Reactor Mode Switch "Refuel" position for the three parameters listed on page 217. The marked-up Table 3.6.2d (page 217) and Notes for Tables 3.6.2d and 4.6.2d (page 219) are included in Attachment 2.

RAI (8):

TSTF-542 STS Table 3.3.5.2-1 Footnote (a), applied to the Required Channels per Function column requirements, is an exception to the instrumentation operability requirements. It states, "Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.2, 'Reactor Pressure Vessel Water Inventory Control.'" Without a reference to Footnote (a), the Table 3.3.5.2-1 functions would be required to be operable for all low pressure ECCS subsystems, regardless of whether the subsystem is credited to meet LCO 3.5.2. In addition, after the NRC approved TSTF-542 for adoption, a generic issue was identified where the footnote was missed on two of the functions in Table 3.3.5.2-1.

Therefore, the TSTF-542 Table 3.3.5.2-1 functions to which Footnote (a) should be applied are as follows:

Core Spray System
- 1.a Reactor Steam Dome Pressure – Low (Injection Permissive)
- 1.b Core Spray Pump Discharge Flow – Low (Bypass)
- 1.c Manual Initiation

Low Pressure Coolant Injection System
- 2.a Reactor Steam Dome Pressure – Low (Injection Permissive)
- 2.b Low Pressure Coolant Injection Pump Discharge Flow – Low (Bypass)
- 2.c Manual Initiation

TSTF-542 STS Table 3.3.5.2-1 and LCO 3.5.2 are similar to proposed NMP1 Table 3.6.2m and LCO 3.1.9, respectively. However, NRC staff did not locate an equivalent to Footnote (a) in the LAR. Please provide technical justification for this variation.

Exelon Response to RAI (8)

A new note (f) is added to Notes for Tables 3.6.2m and 4.6.2m (page 247h) to state, "Associated with the subsystem of Core Spray required to be Operable per Specification 3.1.9, Reactor Pressure Vessel (RPV) Water Inventory Control." Note (f) is applied to Table 3.6.2m on page 247b for the Open Core Spray Discharge Valves Parameter. Placing the note in the instrumentation table is consistent with the NMP1 Custom Technical Specification format. This variation is acceptable and supplements the discussion in Section 2.2.5.1 of Reference 1. The marked-up pages 247b and 247h are provided in Attachment 2.

RAI (9):

TSTF-542, Revision 2 states the following (emphasis added):

> [...] an additional method of water injection, *to augment* the newly required ECCS subsystem, *is also required* when the Drain Time is less than 8 hours". This is especially true for action D, "Drain time < 8 hours.

In the LAR, LCO 3.1.9 in the Proposed TS Marked-Up would maintain only one core spray subsystem operable. The application does not contain an explanation for what additional method(s) of water injection would be used especially when drain time is less than 8 hours.

Describe the additional method(s) of injection that would be used when taking the required action described in Specification e(1) of Proposed TS Marked-Up 3.1.9. In the description, state whether the additional method(s) of injection is able to operate without offsite electrical power.

Exelon Response to RAI (9)

Specification 3.1.9 is revised to include the requirement to operate without offsite electrical power. This is consistent with the NMP1 Custom Technical Specification format. The marked-up LCO 3.1.9 (page 79b) is included in Attachment 2.

RAI (10):

TSTF-542, Revision 2 includes a note before Required Action D.1 in TS 3.5.2 that states:

> Required ECCS injection/spray subsystem or additional method of water injection shall be capable of operating without offsite electrical power.

The equivalent required action in the Proposed TS Marked-Up is Specification e(1) in LCO 3.1.9. Specification e(1) does not include the note. The LAR includes technical justifications for several variations from TSTF-542, Revision 2, but the LAR does not include technical justifications for this variation.

Provide technical justification for the variation from the TSTF-542, Revision 2 note concerning additional method of water injection.

Exelon Response to RAI (10)

Specification 3.1.9 is revised to include the requirement to operate without offsite electrical power. This is consistent with the NMP1 Custom Technical Specification format. The marked-up LCO 3.1.9 (page 79b) is included in Attachment 2.

RAI (11):

In the LCO 3.1.9 of the Proposed TS Marked-Up, the stated objective is "To assure the RPV water inventory is maintained -10 inches indicator scale." However, Specification a supplied with LCO 3.1.9 cites "top of active fuel (TAF)" instead of "-10 inches indicator scale." This appears to be contrary to the discussion in Section 2.2.2 of the LAR and the stated objective of proposed LCO 3.1.9.

Clarify whether water level will be maintained to the TAF or -10 inches indicator scale.

Exelon Response to RAI (11)

LCO 3.1.9a is revised to be consistent with the rest of the changes requiring water level be maintained to the "-10 inches indicator scale." The marked-up LCO 3.1.9 (page 79a) is included in Attachment 2.

ATTACHMENT 2

Nine Mile Point Nuclear Station, Unit 1
Renewed Facility Operating License No. DPR-63
NRC Docket No. 50-220

Response to Request for Additional Information
Revised Markup Pages

TS Marked-up Pages

79a
79b
79c
217
219
247b
247c
247d
247e
247f
247g
247h

TS Bases Marked-up Pages
(for information only)

248a
249
249a

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
3.1.9 Reactor Pressure Vessel (RPV) Water Inventory Control	4.1.9 Reactor Pressure Vessel (RPV) Water Inventory Control
Applicability:	Applicability
Applies to the operating status of the core spray systems and Reactor Water Inventory Control when the reactor coolant temperature is less than or equal to 212°F.	Applies to the periodic testing requirements for the core spray system and RPV water inventory.
Objective:	Objective:
To assure the RPV water inventory is maintained -10 inches indicator scale.	To verify the operability of the core spray system and RPV water inventory.
RAI 11	
Specification:	Specification:
a. Whenever irradiated fuel is in the reactor vessel and the reactor coolant temperature is less than or equal to 212°F, drain time of RPV water inventory to ~~the TAF~~ shall be ≥ 36 hours and one core spray subsystem shall be operable except as specified in Specifications b through f below.	a. Verify drain time ≥ 36 hours in accordance with the Surveillance Frequency Control Program.
-10 inches indicator scale	
b. If the required core spray subsystem becomes inoperable, the component shall be returned to an operable condition within 4 hours.	b. Verify, for a required core spray subsystem, the downcomers in the suppression chamber have greater than or equal to three and one half foot of submergence or the condensate storage tank inventory is not less than 300,000 gallons, in accordance with the Surveillance Frequency Control Program.
c. If Specifications a and b are not met, then immediately initiate action to establish a method of water injection capable of operating without offsite electrical power.	c. Verify for the required core 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.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
d. If drain time < 36 hours and ≥ 8 hours, within 4 hours perform the following actions: (1) Verify secondary containment boundary is capable of being established in less than the drain time. and (2) Verify each secondary containment penetration flow path is capable of being isolated in less than the drain time, and (3) Verify one RBEVS is capable of being placed in operation in less than the drain time.	d. 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. RAI 1(d) ~~e. Verify the required core spray subsystem actuates on a manual initiation signal, in accordance with the Surveillance Frequency Control Program. Vessel spray may be excluded.~~
e. If drain time < 8 hours, immediately perform the following actions: RAIs 9 and 10 (1) Initiate action to establish an additional method of water injection with water sources capable of maintaining RPV water level above -10 inches indicator scale for ≥ 36 hours. and (2) Initiate action to establish secondary containment boundary, and (3) Initiate action to isolate each secondary containment penetration flow path or verify it can be manually isolated from the control room. and (4) Initiate action to verify one RBEVS is capable of being placed in operation.	

without offsite electrical power

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
f. Specifications d and e not met, or drain time is < 1 hour, immediately initiate action to restore drain time to ≥ 36 hour.	

TABLE 3.6.2d

INSTRUMENTATION THAT INITIATES CORE SPRAY[e]

Limiting Condition for Operation

Parameter	Minimum No. of Tripped or Operable Trip Systems	Minimum No. of Operable Instrument Channels per Operable Trip System (f)	Set Point	Reactor Mode Switch Position in Which Function Must Be Operable			
				Shutdown	Refuel	Startup	Run
START CORE SPRAY PUMPS							
(1) High Drywell Pressure	2	2	≤ 3.5 psig	(d)(g)	* (h)	(a)	(a)
(2) Low-Low Reactor Water Level	2	2	≥ 5 inches (Indicator Scale)	(b)(g)	* (h)	x	x
OPEN CORE SPRAY DISCHARGE VALVES							
(3) Reactor Pressure and either (1) or (2) above.	2	2	≥ 365 psig	~~*~~(g)	* (h)	x	x

RAI 7

NOTES FOR TABLES 3.6.2d AND 4.6.2d

(a) May be bypassed when necessary for containment inerting.

(b) May be bypassed when necessary for performing major maintenance as specified in Specification 2.1.1.e.

(c) The trip circuit will be calibrated and tested in accordance with the Surveillance Frequency Control Program, the primary sensor will be calibrated and tested in accordance with the Surveillance Frequency Control Program.

(d) May be bypassed when necessary for integrated leak rate testing.

(e) The instrumentation that initiates the Core Spray System is not required to be operable, if there is no fuel in the reactor vessel.

(f) A channel may be placed in an inoperable status for up to 6 hours for required surveillances without placing the Trip System in the tripped condition provided at least one Operable Instrument Channel in the same Trip System is monitoring that parameter.

With the number of Operable channels less than required by the Minimum Number of Operable Instrument Channels per Operable Trip System requirement:

1. With one channel inoperable, place the inoperable channel in the tripped condition within 24 hours or take the ACTION required by Specification 3.6.2a for that Parameter.

2. With more than one channel inoperable, take the ACTION required by Specification 3.6.2a for that Parameter.

(g) The Parameters for Start Core Spray Pumps and Open Core Spray Discharge Valves in Table 3.6.2d are only applicable in the Shutdown Condition - Hot. See Table 3.6.2m for Parameter applicability in the Shutdown Condition – Cold.

Note 1: Surveillance intervals are specified in the Surveillance Frequency Control Program unless otherwise noted in Table 4.6.2d.

RAI 7

(h) The Parameters are required when Reactor Coolant Temperature is greater than 212 F.

Reviewer notes:
Manual Parameter removal RAIs 1(b) and 2
Notes (b) & (d) removed per RAIs 1(c) and 1(f) - changed note (c) to (b)
Note (f) added per RAI 8.
Note (h) adder per RAI 4
Change from 1 per pump to 2 per RAI 1(e)

TABLE 3.6.2m

RPV WATER INVENTORY CONTROL INSTRUMENTATION

Parameter	Minimum No. of Tripped or Operable Trip Systems	Limiting Condition for Operation: Minimum No. of Operable Instrument Channels per Operable Trip System (h)	Set Point	Reactor Mode Switch Position in Which Function Must Be Operable: Shutdown	Refuel	Startup	Run
~~START CORE SPRAY PUMPS (c)~~							
~~(1) Manual~~	~~1~~	~~1 (d)~~	—	~~(a)(b)~~	~~(a)(b)~~		
OPEN CORE SPRAY DISCHARGE VALVES ~~(c)~~ (b)(f)							
(~~2~~ (1) Reactor Pressure ~~and (1) above.~~	~~1 per pump~~ 2	~~1 per pump (d)~~ 2	≥ 365 psig	(a)	(a)		

Reviewer notes:
Notes changes per RAIs 1(b), 1(c) and 1(f) from (e) to (c) and from (f) to (d).
Note (g) adder per RAI 4.

TABLE 3.6.2m

RPV WATER INVENTORY CONTROL INSTRUMENTATION

Limiting Condition for Operation

Parameter	Minimum No. of Tripped or Operable Trip Systems	Minimum No. of Operable Instrument Channels per Operable Trip System (g)	Set Point	Reactor Mode Switch Position in Which Function Must Be Operable			
				Shutdown	Refuel	Startup	Run
PRIMARY COOLANT ISOLATION							
(1) Low-Low Reactor Water Level							
(a) Cleanup	2	2~~(f)~~ (d)	≥ 5 inches (Indicator Scale)	(a)	(a)		
(b) Shutdown Cooling	2(~~e~~) (c)	2~~(e)(f)~~ (c)(d)	≥ 5 inches (Indicator Scale)	(a)	(a)		
(2) Manual	2	1	---	(a)	(a)		

Reviewer notes:
Manual Parameter removal RAIs 1(b) and 2
Notes changes per RAIs 1(b), 1(c) and 1(f) from (g) to (e)
Remove Sensor Check SR per RAI 3

TABLE 4.6.2m

RPV WATER INVENTORY CONTROL INSTRUMENTATION

Surveillance Requirement

Parameter	Sensor Check	Instrument Channel Test	Instrument Channel Calibration
~~START CORE SPRAY PUMPS~~			
~~(1) Manual~~	~~Note 1~~	~~Note 1(g)~~	~~Note 1(g)~~
OPEN CORE SPRAY DISCHARGE VALVES			
(~~2~~)(1) Reactor Pressure ~~and (1) above~~	~~Note 1~~ ---	Note 1(~~g~~)(e)	Note 1(~~g~~)(e)

Reviewer notes:
Notes changes per RAIs 1(b), 1(c) and 1(f) from (g) to (e)

TABLE 4.6.2m

RPV WATER INVENTORY CONTROL INSTRUMENTATION

Surveillance Requirement

Parameter	Sensor Check	Instrument Channel Test	Instrument Channel Calibration
PRIMARY COOLANT ISOLATION (Cleanup and Shutdown Cooling)			
(1) Low-Low Reactor Water Level	Note 1	Note 1 ~~(g)~~ (e)	Note 1 ~~(g)~~ (e)
(2) Manual	---	Note 1	---

Reviewer notes:
Notes (b) & (d) removed per RAIs 1(c) and 1(f), remaining notes re-sequenced.

NOTES FOR TABLES 3.6.2m AND 4.6.2m

(a) The Parameters in this table are only applicable in the Shutdown Condition – Cold and Refuel. See Table 3.6.2b or Table 3.6.2d for Parameter applicability in the Shutdown Condition – Hot.

~~(b) May be bypassed when necessary for performing major maintenance as specified in Specification 2.1.1.e.~~

(b) ~~(c)~~ The instrumentation that initiates the Core Spray System is not required to be operable if there is no fuel in the reactor vessel.

~~(d) A channel may be placed in an inoperable status for up to 6 hours for required surveillances without placing the Trip System in the tripped condition provided at least one Operable Instrument Channel in the same Trip System is monitoring that parameter.~~

~~With the number of Operable channels less than required by the Minimum Number of Operable Instrument Channels per Operable Trip System requirement:~~

~~1. With one channel inoperable, place the inoperable channel in the tripped condition within 24 hours or take the ACTION required by Specification 3.6.2a for that Parameter.~~

~~2. With more than one channel inoperable, take the ACTION required by Specification 3.6.2a for that Parameter.~~

(c) ~~(e)~~ In the cold shutdown and refueling conditions, only one Operable Trip System is required provided shutdown cooling system integrity is maintained.

With one of the two required Operable Channels in the required Trip System not operable, place the inoperable channel in the tripped condition within 12 hours, otherwise

1. Declare associated penetration flow path(s) incapable of automatic isolation,

and

2. Calculate drain time,

and

3. a. Immediately initiate action to restore the channel to operable status,

or

b Immediately initiate action to isolate the shutdown cooling system.

Reviewer notes:
Notes (b) & (d) removed per RAIs 1(c) and 1(f), remaining notes re-sequenced.
Subsection (13) added per RAI 6.

NOTES FOR TABLES 3.6.2m AND 4.6.2m

~~(f)~~ (d) A channel may be placed in an inoperable status for up to 6 hours for required surveillances without placing the Trip System in the tripped condition provided at least one Operable Instrument Channel in the same Trip System is monitoring that Parameter.

With the number of Operable Channels one less than required by the Minimum Number of Operable Instrument Channels per Operable Trip System requirement for one trip system:

1. Declare associated penetration flow path(s) incapable of automatic isolation,

and

2. Calculate drain time,

and

3. Place the inoperable channel(s) in the tripped condition within,
   a. 12 hours for Parameters common to SCRAM Instrumentation, and
   b. 24 hours for Parameters not common to SCRAM Instrumentation,

or

4. Take the ACTION required by Specification 3.6.2a for that Parameter. (13)

With the number of Operable Channels one less than required by the Minimum Number of Operable Instrument Channels per Operable Trip System requirement for both trip systems:

1. Declare associated penetration flow path(s) incapable of automatic isolation,

and

2. Calculate drain time,

and

3. Place the inoperable channel(s) in one trip system in the tripped condition within one hour,

and

4. Place the inoperable channel(s) in the remaining trip system in the tripped condition within,
   a. 12 hours for Parameters common to SCRAM Instrumentation, and
   b. 24 hours for Parameters not common to SCRAM Instrumentation,

or

5. Take the ACTION required by Specification 3.6.2a for that Parameter. (13)

Reviewer notes:
Notes (b) & (d) removed per RAIs 1(c) and 1(f), remaining notes re-sequenced.
Note (f) added per RAI 8.
Notes (g) and (h) added per RAI 4.

NOTES FOR TABLES 3.6.2m AND 4.6.2m

(e) ~~(g)~~ The trip circuit will be calibrated and tested in accordance with the Surveillance Frequency Control Program, the primary sensor will be calibrated and tested in accordance with the Surveillance Frequency Control Program.

Note 1: Surveillance intervals are specified in the Surveillance Frequency Control Program unless otherwise noted in Table 4.6.2m.

(f) Associated with the subsystem of Core Spray required to be Operable per Specification 3.1.9, Reactor Pressure Vessel (RPV) Water Inventory Control.

(g) With one or more channels inoperable, declare the associated penetration flow paths incapable of automatic isolation and calculate drain time.

(h) With one or more channels inoperable, place the channel in trip within 1 hour.

Each reactor operating condition has a related reactor mode switch position for the safety system. The instrumentation system operability for each mode switch position is based on the requirements of the related safety system. For example, the specific high drywell pressure trip systems must be tripped or operable ~~any time~~in the applicable Operating Condition for core spray, containment spray, automatic depressurization or containment isolation functions ~~are required~~.

In instrumentation systems where two trip systems are required to initiate action, either both trip systems are operable or one is tripped. Having one trip system already tripped does not decrease the reliability in terms of initiating the desired action. However, the probability of spurious actuation is increased. Certain instrument channels or sensor inputs to instrument channels may be bypassed without affecting safe operation. The basis for allowing bypassing of the specified SRM's, IRM's, LPRM's and APRM's is discussed in Volume I (Section VII-C.1.2)*. The high area temperature isolation function for the cleanup system has one trip system. There are three instrument channels; each has four sensor inputs. Only two instrument channels are required since the area covered by any one sensor is also covered by a sensor in one of the other two instrument channels. The shutdown cooling system also has one trip system for high area temperature isolation. However, since the area of concern is much smaller, only one instrument channel is provided. Four sensors provide input to the channel. Since the area covered is relatively small only three of the four sensors are required to be operable in order to assure isolation when needed.

The RPV contains penetrations below -10 inches indicator scale that have the potential to drain the reactor coolant inventory to below the TAF. If the water level should drop below -10 inches indicator scale, the ability to remove decay heat is reduced, which could lead to elevated cladding temperatures and clad perforation. Safety Limit 2.1.1.d and 2.1.1.e contain the requirements for the RPV water level to prevent such elevated cladding temperatures.

With the unit in the Shutdown Condition – Cold or Refuel Condition, RPV water inventory control is not required to mitigate any events or accidents evaluated in the safety analyses. RPV water inventory control is required in these conditions to protect Safety Limit 2.1.1.d, 2.1.1.e and the fuel cladding barrier to prevent the release of radioactive material should a draining event occur. Under the definition of drain time, some penetration flow paths may be excluded from the drain time calculation if they will be isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to -10 inches indicator scale when actuated by RPV water level isolation instrumentation.

The purpose of the RPV Water Inventory Control Instrumentation, Table 3.6.2m, is to support the requirements of LCO 3.1.9 and SR 4.1.9, "Reactor Pressure Vessel (RPV) Water Inventory Control," and the definition of drain time. There are functions that are required for ~~manual initiation or~~ operation of the Core Spray system required to be ~~Oerable~~ by LCO 3.1.4 and other functions that support automatic isolation of Shutdown Cooling and Reactor Water Cleanup system penetration flow path(s) on low RPV water level.

RAI 1(a)

Delete "manual initiation or"

Operable

*FSAR; Letter, R.R. Schneider to A. Giambusso, dated November 15, 1973

Reviewer note:
Corrects typographical error

A double-ended guillotine break of the Reactor Coolant System (RCS) is not postulated in Shutdown Condition – Cold or Refuel Condition due to the reduced RCS pressure, reduced piping stresses, and ductile piping systems. Instead, an event is postulated in which a single operator error or initiating event allows draining of the RPV water inventory 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). It is assumed, based on engineering judgment, that while in Shutdown Condition – Cold or Refuel Condition, one low pressure ECCS injection/spray subsystem can be manually initiated to maintain adequate reactor vessel water level.

Table 3.6.2b requires that the low-low reactor vessel water level instrumentation that initiates isolation of the main steam and cleanup and shutdown cooling system be operable with the reactor mode switch in the Shutdown ~~and Refuel~~ position~~s~~. Two trip systems must be operable or in the tripped condition in the hot shutdown condition. ~~However, in the cold shutdown and refueling conditions, only one trip system (with two instrument channels) must be operable so long as shutdown cooling system integrity is maintained. System integrity is maintained provided the piping is intact and no maintenance is being performed that has the potential for draining the reactor vessel through the system.~~ If one low-low water level instrument channel in a required Trip System becomes inoperable and cannot be restored or placed in the tripped condition within the allowed time, the associated shutdown cooling line should be isolated. However, if the shutdown cooling function is needed to provide core cooling, isolating the shutdown cooling line is not desirable.

Table 3.6.2d requires that the high drywell pressure and low-low reactor water level instrumentation Parameters for Start Core Spray Pumps and the reactor pressure instrumentation Parameter for Open Core Spray Discharge Valves be operable with the reactor mode switch in the shutdown or refuel positions. This is modified with a note clarifying applicability is only in the Shutdown Condition – Hot.

Table 3.6.2m requires that the low-low reactor vessel water level instrumentation that initiates isolation of the ~~main steam and~~ cleanup and shutdown cooling system be operable with the reactor mode switch in the Shutdown or Refuel position. In the Shutdown Condition-Cold and Refuel Condition, only one trip system (with two instrument channels) must be operable so long as shutdown cooling system integrity is maintained. System integrity is maintained provided the piping is intact and no maintenance is being performed that has the potential for draining the reactor vessel through the system.

RAI 1(c)

(d)

Table 3.6.~~2b~~2m, Note ~~(je)~~, allows the shutdown cooling line to remain unisolated and the system to remain in service provided action is immediately initiated to restore the channel to operable status. The alternative action is to immediately initiate action to isolate the shutdown cooling system, which may require that alternate decay heat removal capabilities be provided. The term "immediately" means that the action should be pursued without delay and in a controlled manner. Either of these actions must continue until the channel is restored to operable status or the shutdown cooling system is isolated.

RAI 1(c)

Table 3.6.2.m, Notes ~~(e)~~ (c) and ~~(f)~~ (d) actions 1 and 2 reflect the drain time requirements that penetration flow paths capable of being isolated by valves will close automatically when actuated by RPV water level isolation instrumentation. In the event that the associated instrumentation channels for Reactor Water Cleanup and/or Shutdown Cooling become inoperable, the requirements of Technical Specification 3.1.9.d thru 3.1.9.f are applicable to verify that RPV water level is maintained above -10 inches indicator scale.

Manual initiation is available for scram, reactor isolation and containment isolation. In order to manually initiate other systems, each pump and each valve is independently initiated from the control room. Containment spray raw water cooling is not automatically initiated. Manual initiation of each pump is required as discussed in 3.3.7 above.

ATTACHMENT 3

Nine Mile Point Nuclear Station, Unit 1
Renewed Facility Operating License No. DPR-63
NRC Docket No. 50-220

Supplemental Information

TS Marked-up Pages

243
244
245

This supplemental information provides changes to NMP1 TS Tables 3.6.2k and 4.6.2k, "High Pressure Coolant Injection" (pages 243 and 244) and Notes for Tables 3.6.2k and 4.6.2k (Page 245). The creation of the Reactor Pressure Vessel Water Inventory Control Specification and associated Instrumentation Specifications for the Shutdown Condition - Cold and Refuel Conditions requires changes to the High Pressure Coolant Injection (HPCI) Instrumentation Specification which were not provided in the initial December 15, 2017, submittal. The NMP1 HPCI system is not an Emergency Core Cooling System; however, it is a mode of operation of the existing electric motor driven feed and condensate system pumps. It is reasonable to assume, based on engineering judgment, that while the reactor coolant temperature is less than or equal to 212°F, one Core Spray subsystem can maintain adequate reactor vessel water level and HPCI is not required. This is an acceptable variation to TSTF-542, Rev 2, due to the unique configuration and design of the HPCI system at NMP1. This supplemental information is to clarify that high-pressure injection capability is not required during the Shutdown Condition-Cold. This change is consistent with the changes to the Technical Specifications by TSTF-542, Rev 2.

Note (a) on page 245 is revised to modify the applicability with the addition of a sentence to say "Not required in the Shutdown Condition- Cold," consistent with TSTF-542, Rev 2. On Table 3.6.2k, the Parameter of "Automatic Turbine Trip" is not required with the Mode Switch in Shutdown since the reactor is already shutdown; therefore, note (a) is removed from this parameter. Table 4.6.2k has note (a) added to the Surveillance Requirement for Parameters "Low Reactor Water Level" and "Automatic Turbine Trip" to apply the revised applicability.

TABLE 3.6.2k

HIGH PRESSURE COOLANT INJECTION

Limiting Condition for Operation

	Parameter	Minimum No. of Tripped or Operable Trip Systems	Minimum No. of Operable Instrument Channels per Operable Trip System	Set Point	Reactor Mode Switch Position in Which Function Must Be Operable			
					Shutdown	Refuel	Startup	Run
(1)	Low Reactor Water Level	2	2(c)	≥ 53 inches (Indicator Scale)	(a)		(a)	x
(2)	Automatic Turbine Trip	1	1	---	~~(a)~~		(a)	x

Delete the applicability during shutdown

TABLE 4.6.2k

HIGH PRESSURE COOLANT INJECTION

Surveillance Requirement

	Parameter	Sensor Check	Instrument Channel Test	Instrument Channel Calibration
(1)	Low Reactor Water Level	Note 1 (a)	Note 1 (b) (a)	Note 1 (b) (a)
(2)	Automatic Turbine Trip	None	Note 1 (a)	None

NOTES FOR TABLES 3.6.2k AND 4.6.2k

Not Required in the Shutdown Condition - Cold.

(a) May be bypassed when the reactor pressure is less than 110 psig and the reactor coolant temperature is less than the corresponding saturation temperature.

(b) The trip circuit will be calibrated and tested in accordance with the Surveillance Frequency Control Program, the primary sensor will be calibrated and tested in accordance with the Surveillance Frequency Control Program.

(c) A channel may be placed in an inoperable status for up to 6 hours for required surveillances without placing the Trip System in the tripped condition provided at least one operable channel in the same Trip System is monitoring that parameter.

With the number of Operable channels less than required by the Minimum Number of Operable Instrument Channels per Operable Trip System requirement:

1. For one channel inoperable, place the inoperable channel in the tripped condition within 24 hours or take the ACTION required by Specification 3.6.2a for that Parameter.

2. With more than one channel inoperable, take the ACTION required by Specification 3.6.2a for that Parameter.

Note 1: Surveillance intervals are specified in the Surveillance Frequency Control Program unless otherwise noted in Table 4.6.2k.