

10 CFR 50.90

NMP2L2780

September 30, 2021

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Nine Mile Point Nuclear Station, Unit 2  
Renewed Facility Operating License No. NPF-69  
NRC Docket No. 50-410

Subject: Application to Revise Technical Specifications to Adopt TSTF-582, Revision 0  
"Reactor Pressure Vessel Water Inventory Control (RPV WIC)  
Enhancements"

Pursuant to 10 CFR 50.90, "Application for amendment of license or construction permit, or early site permit," Exelon Generation Company, LLC (Exelon), proposes changes to the Technical Specifications (TS), Appendix A of Renewed Facility Operating License No. NPF-69 for Nine Mile Point Nuclear Station, Unit 2 (NMP2).

Exelon requests adoption of TSTF-582, Revision 0, "Reactor Pressure Vessel Water Inventory Control (RPV WIC) Enhancements." The TS related to RPV WIC are being revised to incorporate operating experience and to correct errors and omissions in TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control."

The enclosure provides a description and assessment of the proposed changes. Attachment 1 provides the existing TS pages marked up to show the proposed changes. Attachment 2 provides the existing TS Bases pages marked up to show revised text associated with the proposed TS changes and is provided for information only.

The proposed changes have been reviewed and approved by the site's Plant Operations Review Committee in accordance with the requirements of the Exelon Quality Assurance Program.

Exelon requests that the amendment requests be reviewed under the Consolidated Line Item Improvement Process (CLIIP).

Exelon requests approval of the proposed amendments by February 28, 2022, in support of the refueling outage scheduled for March, 2022. Once approved, the amendments shall be implemented within 60 days.

There are no regulatory commitments contained in this submittal.

License Amendment Request  
Adopt TSTF-582 RPV WIC Enhancements  
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In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), Exelon is notifying the State of New York of this application for license amendments by transmitting a copy of this letter and its attachments to the designated State Official.

Should you have any questions concerning this letter, please contact Ron Reynolds at 610-765-5247.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 30<sup>th</sup> day of September 2021.

Respectfully,

David T. Judger

David T. Gudger  
Sr. Manager – Licensing  
Exelon Generation Company, LLC

Enclosure: Description and Assessment

Attachments: 1. Proposed Technical Specification Changes (Mark-Up)  
2. Proposed Technical Specification Bases Changes (Mark-Up) – For Information Only

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

**ENCLOSURE**

**License Amendment Request**

**Nine Mile Point Station, Unit 2  
Docket Nos. 50-410**

**Application to Revise Technical Specifications to Adopt TSTF 582, "Reactor  
Pressure Vessel Water Inventory Control (RPV WIC) Enhancements"**

**Description and Assessment**

## 1.0 DESCRIPTION

Pursuant to 10 CFR 50.90, "Application for amendment of license or construction permit, or early site permit," Exelon Generation Company, LLC (Exelon), proposes changes to the Technical Specifications (TS), Appendix A of Renewed Facility Operating License Nos. NPF-69 for Nine Mile Point Nuclear Station, Unit 2 (NMP2).

Exelon requests adoption of TSTF-582, Revision 0, "Reactor Pressure Vessel Water Inventory Control (RPV WIC) Enhancements" (Reference 1). The TS related to RPV WIC are revised to incorporate operating experience and to correct errors and omissions in TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control" (Reference 2).

## 2.0 ASSESSMENT

### 2.1 Applicability of Safety Evaluation

Exelon has reviewed the NRC safety evaluation for TSTF-582 provided to the Technical Specifications Task Force in a letter dated August 13, 2020 (Reference 3). This review included a review of the NRC staff's evaluation, as well as the information provided in TSTF-582. Exelon has concluded that the justifications presented in TSTF-582 and the safety evaluation prepared by the NRC staff are applicable to NMP2 and justify this amendment for incorporation of the changes to the NMP2 TS.

Exelon verifies that the required ECCS injection/spray subsystem can be aligned and the pump started using relatively simple evolutions involving the manipulation of a small number of components. These actions can be performed in a short time (less than the minimum Drain Time of 1 hour) from the control room following plant procedures.

### 2.2 Optional Changes and Variations

Exelon is proposing the following variations from the TS changes described in TSTF-582 or the applicable parts of the NRC staff's safety evaluation.

NMP2 uses different numbering and titles than the improved Standard Technical Specifications (STS) in several instances (e.g., the NMP2 numbering for SRs in 3.6.1.3 are different than those identified in TSTF-582; however, the corresponding SRs are identified in the revised NMP2 TS page 3.8.2-4. These differences are administrative and do not affect the applicability of TSTF-582 to the NMP2 TS.

NMP2 TS 3.3.5.2 contains both high pressure and low pressure coolant injections. The justification for the removal of low pressure coolant injection in TSTF-582 is applicable to both.

SR 3.5.2.2 in the NMP2 TS does not reference the low pressure coolant injection system (LPCI) as shown in TSTF-582. For this surveillance, NMP2 TS states, "Verify, for a required low pressure ECCS injection/spray subsystem, the suppression pool water level is  $\geq 195$  ft." Therefore, the TSTF change does not apply to NMP2 TS. This variation is administrative and does not affect the applicability of TSTF-582 to the NMP2 TS.

NMP2 TS does not contain Condition 3.6.1.3.G as defined in TSTF-582. Condition G in the NMP2 TS is equivalent to Condition 3.6.1.3.H in TSTF-582 and is deleted in accordance with TSTF-582. This variation is administrative and does not affect the applicability of TSTF-582 to the NMP2 TS.

None of the SRs in 3.6.1.3 of the NMP2 TS contain the Note, "Only required to be met in MODES 1, 2 and 3," as shown in TSTF-582. The TSTF change is indicating this Note be deleted from the applicable SRs. Therefore, these changes do not apply to NMP2. These variations are administrative and do not affect the applicability of TSTF-582 to the NMP2 TS.

Surveillance Requirements listed within SR 3.8.1 are numbered differently than the Standard TS. NMP2 TS does not contain NUREG 1433, Revision 4, SR 3.8.1.8. Therefore, the exceptions for SR 3.8.2.1 will list 6 SRs versus 7 SRs.

The model application provided in TSTF-582 includes an attachment for typed, camera-ready (revised) TS pages reflecting the proposed changes. NMP2 is not including such an attachment due to the number of TS pages included in this submittal that have the potential to be affected by other unrelated license amendment requests and the straightforward nature of the proposed changes. Providing only mark-ups of the proposed TS changes satisfies the requirements of 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," in that the mark-ups fully describe the changes desired. This is an administrative deviation from TSTF-582 with no impact on the NRC's model safety evaluation published on August 13, 2020. As a result of this deviation, the contents and numbering of the attachments for this amendment request differ from the attachments specified in the model application in TSTF-582.

### 3.0 REGULATORY ANALYSIS

#### 3.1 No Significant Hazards Consideration Analysis

Exelon Generation Company, LLC (Exelon), proposes changes to the Technical Specifications (TS), Appendix A of Renewed Facility Operating License No. NPF-69 for Nine Mile Point Nuclear Station, Unit 2 (NMP2).

Exelon requests adoption of TSTF-582, Revision 0, "Reactor Pressure Vessel Water Inventory Control (RPV WIC) Enhancements." The TS related to RPV WIC are revised to incorporate operating experience and to correct errors and omissions that were incorporated into the plant TS when adopting TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control." TSTF-582 includes the following changes to the TS:

1. The Drain Time definition is revised to move the examples of common mode failure mechanisms to the Bases and seismic events are no longer considered a common mode failure mechanism. In addition, the Drain Time definition exception from considering the Drain Time for penetration flow paths isolated with manual or automatic valves that are "locked, sealed, or otherwise secured" is revised to apply the exception for manual or automatic valves that are "closed and administratively controlled."
2. TS 3.3.5.2, Condition B, is revised to permit placing an inoperable isolation channel in trip as an alternative to declaring the associated penetration flow path incapable of

- automatic isolation. In addition, TS Table 3.3.5.2-1 is revised to eliminate the requirements for manual ECCS initiation signals to start the required ECCS injection/spray subsystem, and to instead rely on manual valve alignment and pump start (i.e., Low pressure Coolant Injection and ore Spray System).
3. Revised Condition 3.3.5.2.B to add new Required Action B.1 to state, "Initiate action to place channel in trip." Revised old B.1 to B.2.1 and revised old Required Action B.2 to B.2.2 to state, "Initiate action to calculate Drain Time." Tied new Required Action B.1 to Required Action B.2.1 with an "OR" logical connector.
  4. A Surveillance Requirement (SR) 3.5.2.5 is deleted and SR 3.5.2.6 is re-numbered to SR 3.5.2.5 and modified to credit normal operation of the system to satisfy the SR and to permit operation through the test return line.
  5. The SR 3.5.3.5 Bases is revised to reference LCO 3.3.5.3 instead of LCO 3.3.5.2. This change corrects a typographical error.
  6. Applicability of TS 3.6.1.3, "Primary Containment Isolation Valves (PCIVS)," is revised to delete the phrase, "When associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation." This makes TS 3.6.1.3 only applicable Modes 1, 2, and 3. Condition F is revised to delete "in MODE 1, 2, or 3." NMP2 TS does not contain Condition G, as identified in TSTF-582, however, NMP2 Condition G equates to TSTF-582, Condition H and is deleted in accordance with the TSTF.
  7. TS 3.8.2, "AC Sources - Shutdown," SR 3.8.2.1, is revised to not require SRs that test automatic diesel generator start to be met in Modes 4 and 5. Automatic ECCS initiation in Modes 4 and 5 was eliminated in TSTF-542.

Exelon has evaluated if a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Do the proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed changes incorporate operating experience and correct errors and omissions that were incorporated into the plant TS when adopting TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control." Draining of RPV water inventory in Mode 4 (i.e., cold shutdown) and Mode 5 (i.e., refueling) is not an accident previously evaluated and, therefore, revising the existing TS controls to prevent or mitigate such an event has no effect on any accident previously evaluated. RPV water inventory control in Mode 4 or Mode 5 is not an initiator of any accident previously evaluated. The existing and revised TS controls are not mitigating actions assumed in any accident previously evaluated.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed changes incorporate operating experience and correct errors and omissions that were incorporated into the plant TSs when adopting TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control." The event of concern under the current requirements and the proposed change is an unexpected draining event. The TS have contained requirements related to an unexpected draining event during shutdown for over 40 years and this event does not appear as an analyzed event in the Updated Safety Analysis Report (USAR) for any plant or in the NRC's Standard Review Plan (NUREG-0800). Therefore, an unexpected draining event is not a new or different kind of accident not considered in the design and licensing bases that would have been considered a design basis accident in the USAR had it been previously identified.

None of the equipment affected by the proposed changes has a design function described in the USAR to mitigate an unexpected draining event in Modes 4 or 5, although the equipment may be used for that purpose. Therefore, the proposed changes will not change the design function of the affected equipment. The proposed changes will affect the operation of certain equipment, such as the manual initiation function and related instrumentation to permit initiation of the required ECCS injection/spray subsystem, and the control of valves credited for preventing a draining event. However, these changes provide adequate protection to prevent or mitigate an unexpected draining event and do not create the possibility of a new or different kind of accident due to credible new failure mechanisms, malfunctions, or accident initiators not considered in the design and licensing bases.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Do the proposed changes involve a significant reduction in a margin of safety?

Response: No

The proposed changes incorporate operating experience and correct errors and omissions that were incorporated into the plant TSs when adopting TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control."

The safety basis for the RPV WIC requirements is to protect Safety Limit 2.1.1.3. The proposed changes do not affect any specific values that define a safety margin as established in the licensing basis. The proposed changes do not affect a design basis or safety limit, or any controlling value for a parameter established in the UFSAR or the license. Therefore, the proposed changes do not significantly reduce the margin of safety.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above, Exelon concludes that the proposed changes present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

### 3.2 Conclusion

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) 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.

### 4.0 ENVIRONMENTAL EVALUATION

The proposed changes would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. The proposed changes do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed changes meet the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed changes.

### 5.0 REFERENCES

1. TSTF-582, Revision 0, " Reactor Pressure Vessel Water Inventory Control (RPV WIC) Enhancements," dated August 28, 2019 ADAMS Accession No. ML19240A260.
2. TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control," dated March 14, 2016. ADAMS Accession No. ML16074A448.
3. Final Safety Evaluation of Technical Specifications Task Force Traveler TSTF-582, Revision 0, "Reactor Pressure Vessel Water Inventory Control (RPV WIC) Enhancements," dated August 13, 2020. ADAMS Accession No. ML20219A317.
4. NUREG-0123, Revision 2, "Standard Technical Specifications General Electric Boiling Water Reactors (GE-STs)," dated August 1979.



## **ATTACHMENT 1**

### **License Amendment Request**

**Nine Mile Point Nuclear Station, Unit 2 (NMP2)  
Docket No. 50-410**

**Application to Revise Technical Specifications to Adopt TSTF-582, "Reactor  
Pressure Vessel Water Inventory Control (RPV WIC) Enhancements"**

### **Proposed Technical Specifications Markup Pages**

#### **TS Pages**

1.1-3  
3.3.5.2-1 through -5  
3.3.6.1-3  
3.5.1-1  
(page 3.5.2-1 is provided for completeness)  
3.5.2-2 through -5  
3.6.1.3-1  
3.6.1.3-9  
3.8.2-4

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:

closed and  
administratively  
controlled

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)



ACTIONS (continued)

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

## 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
<del>SR 3.3.5.2.3</del>	<del>Perform LOGIC SYSTEM FUNCTIONAL TEST.</del>	<del>In accordance with the Surveillance Frequency Control Program</del>

# RPV Water Inventory Control Instrumentation

## 3.3.5.2

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

(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. <del>High Pressure Core Spray (HPCS) System</del>					
a. <del>Pump Suction Pressure Low</del>	<del>4(b), 5(b)</del>	<del>1(a)</del>	<del>D</del>	<del>SR 3.3.5.2.1 SR 3.3.5.2.2</del>	<del>≥94.5 inches H<sub>2</sub>O</del>
b. <del>HPCS Pump Discharge Pressure High (Bypass)</del>	<del>4, 5</del>	<del>1 per pump (a)</del>	<del>E</del>	<del>SR 3.3.5.2.1 SR 3.3.5.2.2</del>	<del>≥ 220 psig</del>
c. <del>HPCS System Flow Rate Low (Bypass)</del>	<del>4, 5</del>	<del>1 per pump (a)</del>	<del>E</del>	<del>SR 3.3.5.2.1 SR 3.3.5.2.2</del>	<del>≥ 580 gpm and ≤ 720 gpm</del>
1. 4. RHR System Isolation					
a. Reactor Vessel Water Level-Low, Level 3	(e) (a)	2 in one Trip system	B	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 157.8 inches
2. 5. Reactor Water Cleanup (RWCU) System Isolation					
a. Reactor Vessel Water Level-Low Low, Level 2	(e) (a)	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.~~

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>H. Required Action and associated Completion Time of Condition F or G not met.</p> <p><u>OR</u></p> <p>As required by Required Action C.1 and referenced in Table 3.3.6.1-1.</p>	<p>H.1 Be in MODE 3.</p> <p><u>AND</u></p>	12 hours
	<p>H.2 Be in MODE 4.</p>	36 hours
<p>I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.</p>	<p>I.1 Declare associated standby liquid control (SLC) subsystem inoperable.</p> <p><u>OR</u></p>	1 hour
	<p>I.2 Isolate the Reactor Water Cleanup (RWCU) System.</p>	1 hour
<p>J. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.</p>	<p>J.1 Initiate action to restore channel to OPERABLE status.</p> <p><u>OR</u></p>	Immediately
	<p><del>J.2 Initiate action to isolate the Residual Heat Removal (RHR) Shutdown Cooling (SDC) System.</del></p>	<del>Immediately</del>



### 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  $\leq$  150 psig.

#### ACTIONS

High pressure Core Spray (HPCS)

-----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. <del>High Pressure Core Spray (HPCS)</del> System inoperable.	B.1 Verify by administrative means RCIC System is OPERABLE when RCIC is required to be OPERABLE.  <u>AND</u> B.2 Restore HPCS System to OPERABLE status.	Immediately  14 days*

(continued)

\* A one-time change to this Completion Time from 14 days to 35 days due to the HPCS DG replacement has been approved via emergency license amendment request. This Completion Time expires on 12/31/2018 at 0100.

### 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  $\geq 36$  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 $\geq 8$ hours.	C.1 Verify secondary containment boundary is capable of being established in less than the DRAIN TIME.  <u>AND</u>	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
	<p><u>AND</u></p> <p>C.3 Verify one standby gas treatment subsystem is capable of being placed in operation in less than the DRAIN TIME.</p>	4 hours
D. DRAIN TIME < 8 hours.	<p>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 &gt; TAF for ≥ 36 hours.</p>	Immediately
	<p><u>AND</u></p> <p>D.2 Initiate action to establish secondary containment boundary.</p> <p><u>AND</u></p>	Immediately
		(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.5.2.1 Verify DRAIN TIME $\geq 36$ 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 $\geq 195$ 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: <ul style="list-style-type: none"> <li>a. Suppression pool water level is <math>\geq 195</math> ft.</li> </ul> <u>OR</u> <ul style="list-style-type: none"> <li>b. Condensate storage tank B water level is <math>\geq 26.9</math> ft.</li> </ul>	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
<del>SR 3.5.2.5</del>	<p style="text-align: center;"><del>NOTE</del></p> <p><del>Not required to be met for system vent paths opened under administrative control.</del></p> <hr style="border: 1px dashed red;"/> <p><del>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.</del></p>	<p><del>In accordance with the Surveillance Frequency Control Program</del></p> <p>(continued)</p>

## NOTES

1. Operation may be through the test return line.
2. Credit may be taken for normal system operation to satisfy this SR.

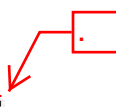
## SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.5.2.6 <span style="border: 1px solid red; padding: 0 2px;">5</span></p> <p style="text-align: center;"><del>NOTE</del></p> <p><del>Not required to be met for ECCS pumps aligned for shutdown cooling.</del></p> <p>Operate the required ECCS injection/spray subsystem <del>through the recirculation line</del> for <math>\geq 10</math> minutes.</p>	In accordance with the Surveillance Frequency Control Program
<p>SR 3.5.2.7 <span style="border: 1px solid red; padding: 0 2px;">6</span></p> <p>Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.</p>	In accordance with the Surveillance Frequency Control Program
<p><del>SR 3.5.2.8</del></p> <p style="text-align: center;"><del>NOTE</del></p> <p><del>Vessel injection/spray may be excluded.</del></p> <p><del>Verify the required LPCI or LPCS subsystem actuates on a manual initiation signal or the required HPCS subsystem can be manually operated.</del></p>	<del>In accordance with the Surveillance Frequency Control Program</del>

### 3.6 CONTAINMENT SYSTEMS

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

LCO 3.6.1.3 Each PCIV and each Secondary Containment Bypass Leakage Valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,   
~~When associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation."~~

#### ACTIONS

#### NOTES

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. -----NOTE----- Only applicable to penetration flow paths with two or more PCIVs. -----</p> <p>One or more penetration flow paths with one PCIV inoperable except due to leakage not within limit.</p>	<p>A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.</p> <p><u>AND</u></p>	<p>4 hours except for main steam line</p> <p><u>AND</u></p> <p>8 hours for main steam line</p>

(continued)

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 <del>MODE 1, 2, or 3.</del>	F.1 Be in MODE 3. <u>AND</u> F.2 Be in MODE 4.	12 hours  36 hours
<del>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.</del>	<del>G.1 Initiate action to restore valve(s) to OPERABLE status.</del> :	<del>Immediately</del>



1. The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.7, SR 3.8.1.8, SR 3.8.1.12 through SR 3.8.1.14, and SR 3.8.1.16.

AC Sources – Shutdown  
3.8.2

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.2.1	<p>----- NOTES -----</p> <p>1. <del>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.</del></p> <p>2. <del>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."</del></p> <p>-----</p> <p>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.</p>	<p>In accordance with applicable SRs</p>

, SR 3.8.1.17

SR 3.8.1.9 through  
SR 3.8.1.11,

## **ATTACHMENT 2**

### **License Amendment Request**

**Nine Mile Point Nuclear Station, Unit 2 (NMP2)  
Docket No. 50-410**

**Application to Revise Technical Specifications to Adopt TSTF-582, "Reactor  
Pressure Vessel Water Inventory Control (RPV WIC) Enhancements"**

### **Proposed Technical Specifications Bases Markup Pages**

#### **TS Bases Pages**

(B 3.3.5.2-1 through -12 are provided for completeness)

B 3.3.5.2-1 through 7

B 3.3.5.2-9 and -10

B 3.3.5.2-12

B 3.3.6.1-33

(B 3.5.2-1 through -10 provided for completeness)

B 3.5.2-2

B 3.5.2-5 through -9

B 3.5.3-7

B 3.8.2-7

## B 3.3 INSTRUMENTATION

### B 3.3.5.2 Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation

#### BASES

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##### BACKGROUND

The RPV contains penetrations below the top of the active fuel (TAF) that have the potential to drain the reactor coolant inventory to below the TAF. If the water level should drop below the TAF, the ability to remove decay heat is reduced, which could lead to elevated cladding temperatures and clad perforation. Safety Limit 2.1.1.3 requires the RPV water level to be above the top of the active irradiated fuel at all times to prevent such elevated cladding temperatures.

Technical Specifications are required by 10 CFR 50.36 to include limiting safety system settings (LSSS) for variables that have significant safety functions. LSSS are defined by the regulation as "Where a LSSS is specified for a variable on which a safety limit has been placed, the setting must be chosen so that automatic protective actions will correct the abnormal situation before a Safety Limit (SL) is exceeded." The Analytical Limit is the limit of the process variable at which a safety action is initiated to ensure that a SL is not exceeded. Any automatic protection action that occurs on reaching the Analytical Limit therefore ensures that the SL is not exceeded. However, in practice, the actual settings for automatic protection channels must be chosen to be more conservative than the Analytical Limit to account for instrument loop uncertainties related to the setting at which the automatic protective action would actually occur. The actual settings for the automatic isolation channels are the same as those established for the same functions in MODES 1, 2, and 3 in ~~LCO 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation," or LCO 3.3.6.1, "Primary Containment Isolation instrumentation."~~

With the unit in MODE 4 or 5, 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 MODES 4 and 5 to protect Safety Limit 2.1.1.3 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 the TAF when actuated by RPV water level isolation instrumentation.

(continued)

## BASES

### BACKGROUND (continued)

The purpose of the RPV Water Inventory Control Instrumentation is to support the requirements of LCO 3.5.2, "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 ECCS injection/spray subsystem required to be OPERABLE by LCO 3.5.2 and other functions that~~ support automatic isolation of Residual Heat Removal subsystem and Reactor Water Cleanup system penetration flow path(s) on low RPV water level.

~~The RPV Water Inventory Control Instrumentation supports operation of low pressure core spray (LPCS), low pressure coolant injection (LPCI), and high pressure core spray (HPCS). The equipment involved with each of these systems is described in the Bases for LCO 3.5.2.~~

### APPLICABLE SAFETY ANALYSIS, LCO, and APPLICABILITY

With the unit in MODE 4 or 5, RPV water inventory control is not required to mitigate any events or accidents evaluated in the safety analysis. RPV water inventory control is required in MODES 4 and 5 to protect Safety Limit 2.1.1.3 and the fuel cladding barrier to prevent the release of radioactive material should a draining event occur.

an



A double-ended guillotine break of the Reactor Coolant System (RCS) is not postulated in MODES 4 and 5 due to the reduced RCS pressure, reduced piping stresses, and ductile piping systems. Instead, ~~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 MODES 4 and 5, one ECCS injection/spray subsystem can be manually initiated to maintain adequate reactor vessel water level.

As discussed in References 1, 2, 3, 4, and 5, operating experience has shown RPV water inventory to be significant to public health and safety. Therefore, RPV Water Inventory Control satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii).

Permissive and interlock setpoints are generally considered as nominal values without regard to measurement accuracy.

(continued)

BASES

APPLICABLE  
SAFETY ANALYSIS,  
LCO, and  
APPLICABILITY  
(continued)

The specific Application Safety Analyses, LCO, and Applicability discussions are listed below on a Function by Function basis.

~~Low Pressure Coolant Injection – A (LPCI) and Low Pressure Core Spray (LPCS) Subsystems~~

~~1.a, 1.b, 2.a. LPCS and LPCI Differential Pressure – Low (Injection Permissive)~~

~~Low differential pressure across the injection valves signals are used as permissives for the low pressure ECCS subsystems. This 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. The Differential Pressure – Low (Injection Permissive) is one of the Functions assumed to be OPERABLE and capable of permitting initiation of the ECCS during the transients analyzed in References 1 and 3. In addition, the Differential Pressure – Low (Injection Permissive) Function is directly assumed in the analysis of the recirculation line break (Ref. 2). The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.~~

~~The Differential Pressure – Low (Injection Permissive) signals are initiated from four differential pressure transmitters that sense the pressure difference across the injection valves of the low pressure ECCS subsystems.~~

~~The Allowable Value is low enough to prevent overpressurizing the equipment in the low pressure ECCS, but high enough to ensure that the ECCS injection prevents the fuel peak cladding temperature from exceeding the limits of 10 CFR 50.46.~~

~~Each channel of Differential Pressure – Low (Injection Permissive) Function (one per valve) is only required to be OPERABLE when the associated ECCS is required to be OPERABLE to ensure that no single instrument failure can preclude ECCS initiation.~~

~~1.c, 1.d, 2.b. LPCS and LPCI Pump Discharge Flow – Low (Bypass)~~

~~The minimum flow instruments are provided to protect the associated low pressure ECCS 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 is sensed, and the valve is automatically closed when the flow rate is adequate to protect the pump.~~

(continued)

BASES

~~APPLICABLE  
SAFETY ANALYSIS,  
LCO, and  
APPLICABILITY  
(continued)~~

~~The LPCI and LPCS Pump Discharge Flow – Low (Bypass) Functions are assumed to be OPERABLE and capable of closing the minimum flow valves to ensure that the low pressure ECCS flows assumed during the transients and accidents analyzed in References 1, 2, and 3 are met. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.~~

~~One differential pressure transmitter 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 when flow is low with the pump running. The logic will close the minimum flow valves once the closure setpoint is exceeded. The LPCI minimum flow valves are time delayed such that the valves will not open for approximately 8 seconds after the switches detect low flow. The time delay is provided to limit reactor vessel inventory loss during the startup of the Residual Heat Removal (RHR) shutdown cooling mode.~~

~~The Pump Discharge Flow – Low Allowable Values are high enough to ensure that the pump flow rate is sufficient to protect the pump, yet low enough to ensure that the closure of the minimum flow valve is initiated to allow full flow into the core.~~

~~One channel of the Pump Discharge Flow – Low Function is required to be OPERABLE in MODES 4 and 5 when the associated LPCS or LPCI pump is required to be OPERABLE by LCO 3.5.2 to ensure the pumps are capable of injecting into the Reactor Pressure Vessel when manually initiated.~~

~~1.e, 2.c. 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.~~

~~There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the push buttons. Each channel of the Manual Initiation Function (two channels per division) is only required to be OPERABLE when the associated ECCS is required to be OPERABLE.~~

(continued)

BASES

~~APPLICABLE  
SAFETY ANALYSIS  
LCO, and  
APPLICABILITY  
(continued)~~

~~High Pressure Core Spray System~~

~~3.a. Pump Suction Pressure – Low~~

~~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. 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.~~

~~Pump Suction Pressure – Low signals are initiated from two pressure transmitters. The Pump Suction Pressure – Low Function Allowable Value is high enough to ensure adequate pump suction head while water is being taken from the CST. The pressure at which the transfer occurs also ensures sufficient volume of water is used by the HPCS pump before the transfer occurs and is analytically determined to prevent the effects of vortexing. The Pump Suction Pressure – Timer Function is initiated by a single time delay relay. While the Pump Suction Pressure – Timer Function is provided to prevent spurious suction source automatic swaps, the Allowable Value 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 Pump Suction Pressure – Low Function are only required to be OPERABLE when HPCS is required to be OPERABLE to ensure that no single instrument failure can preclude HPCS swap to suppression pool source. In addition, one channel of the Pump Suction Pressure – Timer Function is only required to be OPERABLE when HPCS is required to be OPERABLE. Thus, the Functions are required to be OPERABLE in MODES 1, 2, and 3. In MODES 4 and 5, the Functions are required to be OPERABLE only when HPCS is required to be OPERABLE to fulfill the requirements of LCO 3.5.2, HPCS is aligned to the CST, and the CST water level is not within the~~

(continued)

BASES

~~APPLICABLE  
SAFETY ANALYSIS,  
LCO, and  
APPLICABILITY  
(continued)~~

~~limits of SR 3.5.2.2. With CST water level within limits, a sufficient supply of water exists for injection to minimize the consequences of a vessel draindown event. Refer to LCO 3.5.1 and LCO 3.5.2 for HPCS Applicability Bases.~~

~~3.b. 3.c. HPCS Pump Discharge Pressure – High (Bypass) and 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). The HPCS System Flow Rate – Low (Bypass) and HPCS Pump Discharge Pressure – High (Bypass) Functions are assumed to be OPERABLE and capable of closing the minimum flow valve to ensure that the ECCS flow assumed during the transients and accidents analyzed in References 1, 2, and 3 are met. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.~~

~~One differential pressure transmitter is used to detect the HPCS Systems' flow rate. The logic is arranged such that the transmitter causes the minimum flow valve to open, provided the HPCS pump discharge pressure, sensed by another transmitter, is high enough (indicating the pump is operating). The logic will close the minimum flow valve once the closure setpoint is exceeded. (The valve will also close upon HPCS pump discharge pressure decreasing below the setpoint.)~~

~~The HPCS System Flow Rate – Low and HPCS Pump Discharge Pressure – High Allowable Value is high enough to ensure that pump flow rate is sufficient to protect the pump, yet low enough to ensure that the closure of the minimum flow valve is initiated to allow full flow into the core.~~

~~The HPCS Pump Discharge Pressure – High Allowable Value is set high enough to ensure that the valve will not be open when the pump is not operating.~~

~~One channel of each Function associated with one pump is required to be OPERABLE when HPCS is required to be OPERABLE by LCO 3.5.2 in MODES 4 and 5.~~

(continued)



BASES

APPLICABLE  
SAFETY ANALYSIS,  
LCO, and  
APPLICABILITY  
(continued)

RHR System Isolation

**1** 4.a - Reactor Vessel Water Level - Low, Level 3

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 being equal to the TAF. The Reactor Vessel Water Level - Low, Level 3 Function is only required to be OPERABLE when automatic isolation of the associated RHR penetration flow path is credited in calculating DRAIN TIME.

Reactor Vessel Water Level – Low, Level 3 signals are initiated from two differential pressure transmitters (two per trip system) that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. While four channels (two channels per trip system) of the Reactor Vessel Water Level - Low, Level 3 Function are available, only two channels (all in the same trip system) are required to be OPERABLE.

The Reactor Vessel Water Level - Low, Level 3 Allowable Value was chosen to be the same as the RPS Reactor Vessel Water Level - Low, Level 3 Allowable Value (LCO 3.3.1.1), since the capability to cool the fuel may be threatened.

This Function isolates the Group 5 valves.

Reactor Water Cleanup (RWCU) System Isolation

**2** 5.a - Reactor Vessel Water level - Low Low, Level 2

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 being equal to the TAF. The Reactor Vessel Water Level - Low Low, Level 2 Function associated with RWCU System isolation may be credited for automatic isolation of penetration flow paths associated with the RWCU System.

(continued)

## BASES

### APPLICABLE SAFETY ANALYSIS, LCO, and APPLICABILITY (continued)

Reactor Vessel Water Level - Low Low, Level 2 is initiated from four differential pressure transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. While four channels (two channels per trip system) of the Reactor Vessel Water Level - Low, Level 2 Function are available, only two channels (all in the same trip system) are required to be OPERABLE.

The Reactor Vessel Water Level - Low Low, Level 2 Allowable Value was chosen to be the same as the ECCS Reactor Vessel Water Level – Low Low, Level 2 Allowable Value (LCO 3.3.5.1), since the capability to cool the fuel may be threatened.

The Reactor Vessel Water Level – Low Low, Level 2 function is only required to be OPERABLE when automatic isolation of the associated penetration flow path is credited in calculating DRAIN TIME.

This Function isolates Groups 6, 7, and 8 valves.

### ACTIONS

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

#### A.1

Required Action A.1 directs entry into the appropriate Condition referenced in Table 3.3.5.2-1. The applicable Condition referenced in the Table is Function dependent. Each time a channel is discovered inoperable, Condition A is entered for that channel and provides for transfer to the appropriate subsequent Condition.

(continued)

BASES

B.1, B.2.1, and B.2.2

ACTIONS  
(continued)

B.1 and B.2

to be immediately declared

RHR System Isolation, Reactor Vessel Water Level - Low Level 3, and Reactor Water Cleanup System, Reactor Vessel Water Level - Low Low, Level 2 functions are applicable when automatic isolation of the associated penetration flow path is credited 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 directs calculation of DRAIN TIME. The calculation cannot credit automatic isolation of the affected penetration flow paths.

C.1

initiating action to calculate

~~Low reactor steam dome pressure signals are used as permissives for the low pressure ECCS injection/spray subsystem manual initiation functions. If this permissive is inoperable, manual initiation of ECCS is prohibited. Therefore, the permissive must be placed in the trip condition within 1 hour. With the permissive in the trip condition, manual initiation may be performed. Prior to placing the permissive in the tripped condition, the operator can take manual control of the pump and the injection valve to inject water into the RPV.~~

~~The Completion Time of 1 hour is intended to allow the operator time to evaluate any discovered inoperabilities and to place the channel in trip.~~

D.1 and D.2

~~Required Actions D.1 and D.2 are intended to ensure that appropriate actions are taken if multiple, inoperable channels within the same Function result in a loss of automatic suction swap for the HPCS system from the condensate storage tank 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.~~

~~The 1 hour Completion Time is acceptable because it minimizes the risk of HPCS being needed without an adequate water source while allowing time for restoration or alignment of HPCS pump suction to the suppression pool.~~

(continued)

action to place the channel in trip. With the inoperable channel in the tripped condition, the remaining channel will isolate the penetration flow path on low water level. If both channels are inoperable and placed in trip, the penetration flow path will be isolated. Alternatively, Required Action B.2.1 requires

BASES

ACTIONS  
(continued)

E.1

~~If LPCI or LPCS Discharge Flow Low bypass function or HPCS System Discharge Pressure High or Flow Rate Low bypass function is inoperable, 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 the pump does not overheat. 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.~~

F.1

~~With the Required Action and associated Completion Time of Conditions C, D, or E not met, the associated ECCS injection/spray subsystem may be incapable of performing the intended function, and must be declared inoperable immediately.~~

SURVEILLANCE  
REQUIREMENTS

As noted in the beginning of the SRs, the SRs for each RPV Water Inventory Control instrument Function are found in the SRs column of Table 3.3.5.2-1. The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function or redundant Function maintains ECCS initiation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on reliability analyses (Refs. 6 and 7) 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.

(continued)

BASES

SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.3.5.2.1

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

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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.5.2.2

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

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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE  
REQUIREMENTS  
(continued)

~~SR 3.3.5.2.3~~

~~The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.2 overlaps this Surveillance to complete testing of the assumed safety function.~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

REFERENCES

1. Information Notice 84-81 "Inadvertent Reduction in Primary Coolant Inventory in Boiling Water Reactors During Shutdown and Startup," November 1984.
2. Information Notice 86-74, "Reduction of Reactor Coolant Inventory Because of Misalignment of RHR Valves," August 1986.
3. Generic Letter 92-04, "Resolution of the Issues Related to Reactor Vessel Water Level Instrumentation in BWRs Pursuant to 10 CFR 50.54(F)," August 1992.
4. NRC Bulletin 93-03, "Resolution of Issues Related to Reactor Vessel Water Level Instrumentation in BWRs," May 1993.
5. Information Notice 94-52, "Inadvertent Containment Spray and Reactor Vessel Draindown at Millstone 1," July 1994.
- ~~6. NEDC-30936-P-A, "BWR Owners' Group Technical Specification Improvement Analyses for ECCS Actuation Instrumentation, Part 2," December 1988~~
7. NEDC-30851-P-A, Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989

6.



BASES

ACTIONS  
(continued)

H.1 and H.2

If the channel is not restored to OPERABLE status or placed in trip, or any Required Action of Condition F or G is not met and the associated Completion Time has expired, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. This is done by placing the plant in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

I.1 and I.2

If the channel is not restored to OPERABLE status within the allowed Completion Time, the associated SLC subsystem(s) is declared inoperable or the RWCU System is isolated. Since this Function is required to ensure that the SLC System performs its intended function, sufficient remedial measures are provided by declaring the associated SLC subsystem inoperable or isolating the RWCU System.

The Completion Time of 1 hour is acceptable because it minimizes risk while allowing sufficient time for personnel to isolate the RWCU System.

J.1 and J.2

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the associated penetration flow path should be closed. However, if the shutdown cooling function is needed to provide core cooling, these Required Actions allow the penetration flow path to remain unisolated provided action is immediately initiated to restore the channel to OPERABLE status ~~or to isolate the RHR Shutdown Cooling System (i.e., provide alternate decay heat removal capabilities so the penetration flow path can be isolated).~~ ACTIONS must continue until the channel is restored to OPERABLE status ~~or the RHR Shutdown Cooling System is isolated.~~

(continued)

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

### B 3.5.2 Reactor Pressure Vessel (RPV) Water Inventory Control

#### BASES

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##### BACKGROUND

The RPV contains penetrations below the top of the active fuel (TAF) that have the potential to drain the reactor coolant inventory to below the TAF. If the water level should drop below the TAF, the ability to remove decay heat is reduced, which could lead to elevated cladding temperatures and clad perforation. Safety Limit 2.1.1.3 requires the RPV water level to be above the top of the active irradiated fuel at all times to prevent such elevated cladding temperatures.

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##### APPLICABLE SAFETY ANALYSES

The ECCS performance is evaluated for the entire spectrum of break sizes for a postulated loss of coolant accident (LOCA). The long term cooling analysis following a design basis LOCA (Ref. 1) demonstrates that only one ECCS injection/spray subsystem is required, post LOCA, to maintain adequate reactor vessel water level in the event of an inadvertent vessel draindown. It is reasonable to assume, based on engineering judgment, that while in MODES 4 and 5, one ECCS injection/spray subsystem can maintain adequate reactor vessel water level. A minimum of one ECCS injection/spray subsystem is required to be OPERABLE in MODES 4 and 5.

The ECCS satisfy Criterion 3 of Reference 2.

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##### LCO

The RPV water level must be controlled in MODES 4 and 5 to ensure that if an unexpected draining event should occur, the reactor coolant water level remains above the top of the active irradiated fuel as required by Safety Limit 2.1.1.3.

The Limiting Condition for Operation (LCO) requires the DRAIN TIME of RPV water inventory in the TAF to be  $\geq 36$  hours. A DRAIN TIME of 36 hours is considered reasonable to identify and initiate action to mitigate unexpected draining of reactor coolant. An event that could cause loss of RPV water inventory and result in the RPV water level reaching the TAF in greater than 36 hours does not represent a significant challenge to Safety Limit 2.1.1.3 and can be managed as part of normal plant operation.

(continued)



Operability of the ECCS injection/spray subsystem includes any necessary valves, instrumentation, or controls needed to manually align and start the subsystem from the control room

RPV Water Inventory Control  
B 3.5.2

## BASES

from the control room

aligned and

## LCO (continued)

One ECCS injection/spray subsystem is required to be OPERABLE and capable of being manually started to provide defense-in-depth should an unexpected draining event occur. A ECCS injection/spray subsystem is defined as either one of the three Low Pressure Coolant Injection (LPCI) subsystems, one Low Pressure Core Spray (LPCS) System, or one High Pressure Core Spray (HPCS) System. The LPCS System and each LPCI subsystem consist 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 condensate storage tank B (CST) to the RPV. The necessary portions of the Service Water System and Ultimate Heat Sink capable of providing cooling to the RHR pump seal cooler are also required for a LPCI subsystem. Management of gas voids is important to ECCS injection/spray subsystem OPERABILITY.

The LCO is modified by a Note which allows a required LPCI subsystem (A or B) to be considered OPERABLE during alignment and operation for decay heat removal, if capable of being manually realigned (remote or local) to the LPCI mode and not otherwise inoperable. Alignment and operation for decay heat removal includes when the required RHR pump is not operating or when the system is realigned from or to the RHR shutdown cooling mode. Because of the restrictions on DRAIN TIME, sufficient time will be available following an unexpected draining event to manually align and initiate LPCI subsystem operation to maintain RPV water inventory prior to the RPV level reaching the TAF.

"Instrumentation,"

## APPLICABILITY

RPV water inventory control is required in MODES 4 and 5. Requirements on water inventory control in either MODES are contained in LCOs to Section 3.3, ~~Instrumentation~~, and other LCOs in Section 3.5, ~~ECCS, RCIC, and RPV Water Inventory Control~~. RPV water inventory control is required to protect Safety Limit 2.1.1.3 which is applicable whenever irradiated fuel is in the reactor vessel.

"ECCS, RPV Water Inventory Control, and RCIC System."

## ACTIONS

A.1 and B.1

If the required ECCS injection/spray subsystem is inoperable, it must be restored to OPERABLE status within 4 hours. In this condition, the 4 hour Completion Time for restoring the required ECCS injection/spray subsystem to OPERABLE status is based on engineering judgment that considers the LCO controls on DRAIN TIME and the low probability of an unexpected draining event that would result in loss of RPV water inventory.

(continued)

## BASES

### ACTIONS

#### A.1 and B.1 (continued)

If the inoperable ECCS injection/spray subsystem is not restored to OPERABLE status within the required Completion Time, action must be initiated immediately to establish a method of water injection capable of operating without offsite electrical power. The method of water injection includes the necessary instrumentation and controls, water sources, and pumps and valves needed to add water to the RPV or refueling cavity should an unexpected draining event occur. The method of water injection may be manually initiated and may consist of one or more systems or subsystems, and must be able to access water inventory capable of maintaining the RPV water level above the TAF for a  $\geq 36$  hours. If recirculation of injected water would occur, it may be credited in determining the necessary water volume.

#### C.1, C.2, and C.3

With the DRAIN TIME less than 36 hours but greater than or equal to 8 hours, compensatory measures should be taken to ensure the ability to implement mitigating actions should an unexpected draining event occur. Should a draining event lower the reactor coolant level to below the TAF, there is potential for damage to the reactor fuel cladding and release of radioactive material. Additional actions are taken to ensure that radioactive material will be contained, diluted, and processed prior to being released to the environment.

The secondary containment provides a controlled volume in which fission products can be contained, diluted, and processed prior to release to the environment. Required Action C.1 requires verification of the capability to establish the secondary containment boundary in less than the DRAIN TIME. The required verification confirms actions to establish the secondary containment boundary are preplanned and necessary materials are available. The secondary containment boundary is considered established when one Standby Gas Treatment (SGT) subsystem is capable of maintaining a negative pressure in the secondary containment with respect to the environment.

(continued)

## BASES

### ACTIONS

#### C.1, C.2, and C.3 (continued)

Verification that the secondary containment boundary can be established must be performed within 4 hours. The required verification is an administrative activity and does not require manipulation or testing of equipment. Secondary containment penetration flow paths form a part of the secondary containment boundary. Required Action C.2 requires verification of the capability to isolate each secondary containment penetration flow path in less than the DRAIN TIME. The required verification confirms actions to isolate the secondary containment penetration flow paths are preplanned and necessary materials are available. Power operated valves are not required to receive automatic isolation signals if they can be closed manually within the required time. Verification that the secondary containment penetration flow paths can be isolated must be performed within 4 hours. The required verification is an administrative activity and does not required manipulation or testing of equipment.

One SGT subsystem is capable of maintaining the secondary containment at a negative pressure with respect to the environment and filter gaseous releases. Required Action C.3 requires verification of the capability to place one SGT subsystem in operation in less than the DRAIN TIME. The required verification confirms actions to place a SGT subsystem in operation are preplanned and necessary materials are available. Verification that a SGT subsystem can be placed in operation must be performed within 4 hours. The required verification is an administrative activity and does not require manipulation or testing of equipment.

#### D.1, D.2, D.3, and D.4

With the DRAIN TIME less than 8 hours, mitigating actions are implemented in case an unexpected draining event should occur. Note that if the DRAIN TIME is less than 1 hour, Required Action E.1 is also applicable.

Required Action D.1 requires immediate action to establish an additional method of water injection augmenting the ECCS injection/spray subsystem required by the LCO. The additional method of water injection includes the necessary instrumentation and controls, water sources, and pumps and valves needed to add water to the RPV or refueling cavity should an unexpected draining event occur. The Note to Required Action D.1 states that either the ECCS injection/spray subsystem or the additional method of water injection must be

(continued)

## BASES

### D.1, D.2, D.3, and D.4 (Continued)

capable of operating without other electrical power. The additional method of water injection may be manually initiated and may consist of one or more systems or subsystems. The additional method of water injection must be able to access water inventory capable of being injected to maintain the RPV water level above the TAF for  $\geq 36$  hours. The additional method of water injection and the ECCS injection/spray subsystem may share all or part of the same water sources. If recirculation of injected water would occur, it may be credited in determining the required water volume.

Should a draining event lower the reactor coolant level to below the TAF, there is potential for damage to the reactor fuel cladding and release of radioactive material. Additional actions are taken to ensure that radioactive material will be contained, diluted, and processed prior to being released to the environment.

The secondary containment provides a control volume into which fission products can be contained, diluted, and processed prior to release to the environment. Required Action D.2 required that actions be immediately initiated to establish the secondary containment boundary. With the secondary containment boundary established, one SGT subsystem is capable of maintaining a negative pressure in the secondary containment with respect to the environment.

The secondary containment penetrations form a part of the secondary containment boundary. Required Action D.3 requires that actions be immediately initiated to verify that each secondary containment penetration flow path is isolated or to verify that it can be manually isolated from the control room.

↑ automatically or

One SGT subsystem is capable of maintaining the secondary containment at a negative pressure with respect to the environment and filter gaseous releases. Required Action D.4 requires that actions be immediately initiated to verify that at least one SGT subsystem is capable of being placed in operation. The required verification is an administrative activity and does not require manipulating or testing of equipment.

(continued)

BASES

E.1

If the Required Actions and associated Completion times of Condition C or D are not met or if the DRAIN TIME is less than 1 hour, actions must be initiated immediately to restore the DRAIN TIME to  $\geq 36$  hours. In this condition, there may be insufficient time to respond to an unexpected draining event to prevent the RPV water inventory from reaching the TAF. Note that Required Actions D.1, D.2, D.3, and D.4 are also applicable when DRAIN TIME is less than 1 hour.

SURVEILLANCE  
REQUIREMENTS

SR 3.5.2.1

The Surveillance verifies that the DRAIN TIME of RPV water inventory to the TAF is  $\geq 36$  hours. The period of 36 hours is considered reasonable to identify and initiate action to mitigate draining of reactor coolant. Loss of RPV water inventory that would result in the RPV water level reaching the TAF in greater than 36 hours does not represent a significant challenge to Safety Limit 2.1.1.3 and can be managed as part of normal plant operation.

The definition of DRAIN TIME states that realistic cross-sectional areas and drain rates are used in the calculation. A realistic drain rate may be determined using a single, step-wise, or integrated calculation considering the changing RPV water level during a draining event. For a Control Rod RPV penetration flow path with the Control Rod Drive Mechanism removed and not replaced with a blank flange, the realistic cross-sectional area is based on the control rod blade seated in the control rod guide tube. If the control rod blade will be raised from the penetration to adjust or verify seating of the blade, the exposed cross-sectional area of the RPV penetration flow path is used.

closed and  
administratively  
controlled

The definition of DRAIN TIME excludes from the calculation those 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. A blank flange or other bolted device must be connected with a sufficient number of bolts to prevent draining ~~in the event of an~~ ~~Operating Basis Earthquake~~. Normal or expected leakage from closed systems or past isolation devices is permitted. Determination that a system is intact and closed or isolated must consider the status of branch lines ~~and ongoing plant maintenance and testing activities.~~

(continued)

BASES

SURVEILLANCE  
REQUIREMENTS

SR 3.5.2.1 (Continued)

The Residual Heat Removal (RHR) Shutdown Cooling System is only considered an intact closed system when misalignment issues (Reference 6) have been precluded by functional valve interlocks or by isolation devices, such that redirection of RPV water out of an RHR subsystem is precluded. Further, RHR Shutdown Cooling System is only considered an intact closed system if its controls have not been transferred to Remote Shutdown, which disables the interlocks and isolation signals.

, or multiple  
penetration flow  
paths susceptible  
to a common mode  
failure,

Reasonable  
controls should be  
implemented to  
prevent such  
temporary  
alterations from  
causing

such as, but not limited to,  
controls consistent with the  
guidance in NUMARC 93-01,  
"Industry Guidelines for  
Monitoring the Effectiveness  
of Maintenance at Nuclear  
Power Plants," Revision 4,  
NUMARC 91-06, "Guidelines  
for Industry Actions to Assess  
Shutdown Management," or  
comments to NUREG-0612,  
Control of Heavy Loads at  
Nuclear Power Plants."

The exclusion of penetration flow paths from the determination of DRAIN TIME ~~must~~ <sup>a</sup> consider the ~~potential effects of a single operator error or initiating event on items supporting maintenance and testing (rigging, scaffolding, temporary shielding, piping plugs, snubber removal (except when risk is managed in accordance with TS LCO 3.0.8), freeze seals, etc.). If failure of such items could result and would cause a draining event from a closed system or between the RPV and the isolation device, the penetration flow path may not be excluded from the DRAIN TIME calculation.~~ <sup>should</sup>

temporary  
alterations in  
support of  
maintenance

Surveillance Requirement 3.0.1 requires SRs to be met between performances. Therefore, any changes in plant conditions that would change the DRAIN TIME requires that a new DRAIN TIME be determined. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.2 and SR 3.5.2.3

The minimum water level of 195 ft required for the suppression pool is periodically verified to ensure that the suppression pool will provide adequate net positive suction head (NPSH) for the ECCS pump, recirculation volume, and vortex prevention. With the suppression pool water level less than the required limit, the required ECCS injection/spray subsystem is inoperable unless aligned to an OPERABLE CST.

When the suppression pool level is < 195 ft, the HPCS System is considered OPERABLE only if it can take suction from CST B and CST B water level is sufficient to provide the required NPSH for the HPCS pump. Therefore, a verification that either the suppression pool water level is ≥ 195 ft or the HPCS System is aligned to take suction from the CST and

(continued)

## BASES

### SURVEILLANCE REQUIREMENTS

#### SR 3.5.2.2 and SR 3.5.2.3 (Continued)

the CST contains  $\geq 253,000$  gallons of water, equivalent to 26.9 ft, ensures that the HPCS System can supply 135,000 gallons of makeup water to the RPV. In addition, to ensure the 135,000 gallons of makeup water is available, the HPCS suction source auto-swap from the CST to the suppression pool must be disabled (e.g., by closing the suppression pool suction valve and deenergizing the breaker for the valve motor operator). This is necessary since the actual trip setpoint of the HPCS Pump Suction Pressure – Low Function is at a pressure sufficiently high such that 135,000 gallons would not be available before the auto-swap occurred.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

#### SR 3.5.2.4

The flow path piping has the potential to develop voids and pockets of entrained air. Maintaining the pump discharge lines of the required ECCS injection/spray subsystems full of water ensures that the ECCS subsystem will perform properly. This may also prevent a water hammer following an ECCS initiation signal. One acceptable method of ensuring that the lines are full is to vent at the high points. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

actuation

#### SR 3.5.2.5

~~Verifying the correct alignment for manual, power operated, and automatic valves in the required ECCS subsystem flow path provides assurance that the proper flow paths will be available for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

(continued)

This SR is modified by two Notes. Note 1 states that testing

RPV Water Inventory Control  
B 3.5.2

BASES

may be done

SURVEILLANCE  
REQUIREMENTS  
(continued)

test return line

Note 2 states that credit for meeting the SR may be taken for normal system operation that satisfies the SR, such as using the RHR mode of LPCI for  $\geq 10$  minutes.

SR 3.5.2.6 <sup>5</sup>

Verifying that the required ECCS injection/spray subsystem can be manually started and operate for at least 10 minutes demonstrates that the subsystem is available to mitigate a draining event. Testing the ECCS injection/spray subsystem through the recirculation line (full flow test line) is necessary to avoid overfilling the refueling cavity. The minimum operating time of 10 minutes was based on engineering judgment.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.7 <sup>6</sup>

Verifying 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. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~SR 3.5.2.8~~

~~The required ECCS subsystem is required to actuate on a manual initiation signal. This Surveillance verifies that a manual initiation signal will cause the required LPCI subsystem or LCPS System to start and operate as designed, including pump startup and actuation of all automatic valves to their required positions. The HPCS System is verified to start manually from a standby configuration, and includes the ability to override the RPV Level 8 injection valve isolation. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~This SR is modified by a Note that excludes vessel injection/spray during the Surveillance. Since all active components are testable and full flow can be demonstrated by recirculation through the test line, coolant injection into the RPV is not required during the Surveillance.~~



BASES

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REFERENCES

1. Information Notice 84-81 "Inadvertent Reduction in Primary Coolant Inventory in Boiling Water Reactors During Shutdown and Startup," November 1984.
2. Information Notice 86-74, "Reduction of Reactor Coolant Inventory Because of Misalignment of RHR Valves," August 1986.
3. Generic Letter 92-04, "Resolution of the Issues Related to Reactor Vessel Water Level Instrumentation in BWRs Pursuant to 10 CFR 50.54(F), " August 1992.
4. NRC Bulletin 93-03, "Resolution of Issues Related to Reactor Vessel Water Level Instrumentation in BWRs," May 1993.
5. Information Notice 94-52, "Inadvertent Containment Spray and Reactor Vessel Drindown at Millstone 1," July 1994.
6. General Electric Service Information Letter No. 388, "RHR Valve Misalignment During Shutdown Cooling Operation for BWR 3/4/5/6," February 1983.
7. 10 CFR 50.36(c)(2)(ii).

## BASES

### SURVEILLANCE REQUIREMENTS (continued)

#### SR 3.5.3.5

The RCIC System is required to actuate automatically to perform its design function. This Surveillance verifies that with a required system initiation signal (actual or simulated) the automatic initiation logic of RCIC will cause the system to operate as designed, i.e., actuation of the system throughout its emergency operating sequence, which includes automatic pump startup and actuation of all automatic valves to their required positions. This Surveillance also ensures that the RCIC System will automatically restart on an RPV low water level (Level 2) signal received subsequent to an RPV high water level (Level 8) trip and that the suction is automatically transferred from the CST to the suppression pool on a CST low water level signal. The LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.2 overlaps this Surveillance to provide complete testing of the assumed design function.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note that excludes vessel injection during the Surveillance. Since all active components are testable and full flow can be demonstrated by recirculation through the test line, coolant injection into the RPV is not required during the Surveillance.

### REFERENCES

1. 10 CFR 50, Appendix A, GDC 33.
2. USAR, Section 5.4.6.1.
3. 10 CFR 50.36(c)(2)(ii).
4. Memorandum from R.L. Baer (NRC) to V. Stello, Jr. (NRC), "Recommended Interim Revisions to LCO's for ECCS Components," December 1, 1975.

BASES (continued)

SR 3.8.1.9 through Sr 3.8.1.11,

SURVEILLANCE  
REQUIREMENTS

SR 3.8.2.1

and SR 3.8.1.17 are

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the AC sources in other than MODES 1, 2, and 3 to be applicable. SR 3.8.1.15 is not required to be met because the required OPERABLE DG(s) is not required to undergo periods of being synchronized to the offsite circuit. SR 3.8.1.18 is excepted because starting independence is not required with the DG(s) that is not required to be OPERABLE. Refer to the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

which precludes

a

This SR is modified by two Notes. The reason for Note 1 is to preclude requiring the OPERABLE DG(s) from being paralleled with the offsite power network or otherwise rendered inoperable during the performance of SRs, and to preclude de-energizing a required 4.16 kV emergency bus or disconnecting a required offsite circuit during performance of SRs. With limited AC sources available, a single event could compromise both the required circuit and the DG. It is the intent that these SRs must still be capable of being met, but actual performance is not required during periods when the DG and offsite circuit are required to be OPERABLE. Note 2 states that SRs 3.8.1.10 and 3.8.1.17 are not required to be met when its associated ECCS subsystem(s) are not required to be OPERABLE. These SRs demonstrate the DG response to an ECCS initiation signal (either alone or in conjunction with a loss of offsite power signal). This is consistent with the ECCS instrumentation requirements that do not require the ECCS initiation signals when the associated ECCS subsystem is not required to be OPERABLE per LCO 3.5.2, "ECCS Shutdown."

REFERENCES

1. 10 CFR 50.36(c)(2)(ii).