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10 CFR 50.90

NMP2L2789

December 16, 2021

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

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

Subject: Response to Request for Additional Information by the Office of Nuclear Reactor Regulation to Support Review of Nine Mile Point Nuclear Station, Unit 2, License Amendment Request to Adopt TSTF-582, Revision 0

References:
1. Letter from D. Gudger (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Application to Revise Technical Specifications to Adopt TSTF-582, Revision 0 'Reactor Pressure Vessel Water Inventory Control (RPV WIC) Enhancements," dated September 30, 2021

2. Letter from R. Guzman (Senior Project Manager, U.S Nuclear Regulatory Commission) to R. Reynolds (Exelon),"Request for Additional Information, LAR to Adopt TSTF-582, Revision 0 (EPID L-2021-LLA-0176," dated November 16, 2021

By letter dated September 30, 2021 (Reference 1), Exelon Generation Company, LLC (Exelon) requested to change The Nine Mile Point Unit 2 (NMP2) Technical Specifications (TS). The proposed amendment request would modify NMP2 TS to adopt the changes described in Technical Specification Task Force (TSTF) Traveler TSTF-582, Revision 0, "Reactor Pressure Vessel Water Inventory Control (RPV WIC) Enhancements."

On November 8, 2021, the U.S. Nuclear Regulatory Commission (NRC) identified a draft request for additional information necessary to complete the review. On November 15, 2021, a clarification teleconference was held between NRC and Exelon personnel. On November 16, 2021 (Reference 2), the NRC issued to Exelon a formal request for additional information.

Attachment 1 to this letter contains the NRC's request for additional information immediately followed by Exelon's response. In addition to these RAI responses, Exelon is including the changes specified in TSTF-583-T as additional variations to TSTF-582, Revision 0.

Attachment 2 to this letter includes the TS marked up pages to reflect changes from TSTF-582, Revision 0, and changes described in TSTF-583-T, Revision 0. The attached TS markups supersede in its entirety the TS markups provided in Reference 1. Attachment 3 to this letter includes the TS Bases marked up pages to reflect changes from TSTF-582 and changes described in TSTF-583-T, Revision 0. These TS Bases markups supersede in its entirety the TS Bases markups provided in Reference 1. Attachment 4 contains a revised list of optional changes and variations. The additional variations as a result of adding TSTF-583-T changes are identified in Attachment 4. This list supersedes in its entirety the list provided in Section 2.2 of Reference 1.

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 16th day of December 2021.

Respectfully,

David T. Gudger

David T. Gudger
Senior Manager – Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Attachment 1: Response to Request for Additional Information
Attachment 2: Technical Specification Marked Up Pages
Attachment 3: Technical Specifications Bases Marked Up Pages
Attachment 4: Optional Changes and Variations

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

ATTACHMENT 1

Response to Request for Additional Information

REQUEST FOR ADDITIONAL INFORMATION

Regulatory Basis:

The regulation at Title 10 to the *Code of Federal Regulations* (10 CFR) Section 50.36(c)(2) requires that TSs include limiting conditions for operation (LCOs). Per 10 CFR 50.36(c)(2)(i), LCOs "are the lowest functional capability or performance levels of equipment required for safe operation of the facility." The regulation also requires that when an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TS until the condition can be met.

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

Request:

Section 2.2 of Attachment 1 to the LAR describes optional changes and variations (a few of the items identified as variations are included in the NUREG-1434 mark-up for TSTF-582). However, there are other variations in the TS markup pages that are not listed. The NRC staff identified items that were not included in Section 2.2 of the LAR. Please provide technical justification for the following variations from TSTF-582.

RAI 1.:

NMP2 TS 3.3.5.2 (RPV WIC Instrumentation):

a. Condition A was not deleted, and Condition B and Required Actions were not renumbered as A.

b. Note 1 above the TS 3.3.5.2 SRs has edits that are different.

c. The Table 3.3.5.2-1 column headings “Conditions Referenced from Required Action A.1” and “Surveillance Requirements” and the associated contents are not deleted in total.

Exelon Response to RAI 1.

1.a The revised Technical Specifications (TS) markup for TS page 3.3.5.2-1 deletes Condition A and re-numbers Condition B to Condition A in accordance with TSTF-582, Revision 0. See Attachments 2 and 3 for TS and TS Bases marked up pages, respectively.

1.b Note 1 on TS page 3.3.5.2-3 is revised in accordance with TSTF-582, Revision 0. See Attachments 2 and 3 for TS and TS Bases marked up pages, respectively.

1.c TS pages 3.3.5.2-4 (Table 3.3.5.2-1, page 1 of 2) and 3.3.5.2-5 (Table 3.3.5.2-1, page 2 of 2) are revised to delete columns "Conditions Referenced from Required Action A.1," and "Surveillance Requirements," in accordance with TSTF-582, Revision 0. See TS Marked Up Pages in Attachment 2 for revised changes.

RAI 2.:

NMP2 TS 3.5.2 (RPV WIC):

a. The licensee proposed to delete the existing Note for NMP2 SR 3.5.2.6 which states, “Not required to be met for ECCS pumps aligned for shutdown cooling.” TSTF-582 equivalent (NUREG-1434), SR 3.5.2.6 does not have this Note.

b. The revision of the SR 3.5.2.6 wording is different from TSTF-582.

c. Standard TSs (STS) SR 3.5.2.8 (Verify the required ECCS [emergency core cooling system] injection/spray subsystem actuates on a manual initiation signal) is revised in TSTF-582 to verify manual operation capability. Conversely in the LAR, the licensee proposed to delete NMP2 SR 3.5.2.8, which is a plant-specific version of the aforementioned SR.

Exelon Response to RAI 2.

2.a With the deletion of SR 3.5.2.5 in accordance with TSTF-582, Revision 0, SR 3.5.2.6 is renumbered as SR 3.5.2.5. The renumbered SR 3.5.2.5 currently contains a Note "Not required to be met for ECCS pumps aligned for shutdown cooling." This Note is deleted as TSTF-582, Revision 0, new Note 2, allows to take credit for normal system operation that satisfies this SR. The deletion of the existing Note is a variation to TSTF-582. However, this change aligns NMP2 TS with the TSTF. This variation is added to the Optional Changes and Variations and is provided in Attachment 4.

2.b TS page 3.5.2-5, SR 3.5.2.6, is revised to renumber the SR to SR 3.5.2-5 and to delete the phrase "through the recirculation line," in accordance with TSTF-582, Revision 0. See TS Marked Up Pages in Attachment 2 for revised changes.

2.c With the deletion of SR 3.5.2.5 in accordance with TSTF-582, Revision 0, SR 3.5.2.8 on TS page 3.5.2-5, is renumbered as SR 3.5.2.7. The renumbered SR 3.5.2.7 is revised to say, "Verify the required ECCS injection/spray subsystem can be manually operated." This change is in accordance with TSTF-582, Revision 0.

ATTACHMENT 2

Technical Specification Marked Up Pages

These TS markups supersede, in its entirety,
the TS markups submitted in Reference 1

TS Marked Up Pages

1.1-4
3.3.5.2-1 thru -5
3.3.6-3
3.3.6-4
3.3.8-1
3.5.1-1
3.5.2-2 thru -5
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)

3.3 INSTRUMENTATION

3.3.5.2 Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation

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

APPLICABILITY:
According to Table 3.3.5.2-1.

ACTIONS

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

A. One or more channels inoperable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A. One or more channels inoperable.~~	~~A.1~~ ~~Enter the Condition referenced in Table 3.3.5.2-1 for the channel.~~	~~Immediately~~
OR		
~~B. As required by Required Action A.1 and referenced in Table 3.3.5.2-1~~	~~B.1~~ Declare associated penetration flow path(s) incapable of automatic isolation.	Immediately
A.2.1		
Initiate action to calculate	AND	
A.2.2	~~B.2~~ ~~Calculate~~ DRAIN TIME.	Immediately
~~C. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.~~	~~C.1~~ ~~Place channel in trip.~~	~~1 hour~~

Initiate action to place channel in trip.

A.1

Immediately

(continued)

ACTIONS (continued)

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

These SRs apply to each Function in

SURVEILLANCE REQUIREMENTS

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

1. ~~Refer to~~ Table 3.3.5.2-1 ~~to determine which SRs apply for each ECCS Function~~.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function or the redundant Function maintains ECCS initiation capability.

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

Table 3.3.5.2-1 (page 1 of 2)
RPV Water Inventory Control Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1.	Low Pressure Coolant Injection-A (LPCI) and Low Pressure Core Spray (LPCS) Subsystems					
a.	LPCS Differential Pressure-Low (Injection Permissive)	4, 5	1(a)	C	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 40 psid and ≤ 98 psid
b.	LPCI A Differential Pressure-Low (Injection Permissive)	4, 5	1(a)	C	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 70 psid and ≤ 150 psid
c.	LPCS Pump Discharge Flow-Low (Bypass)	4, 5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 1000 gpm and ≤ 1440 gpm
d.	LPCI Pump A Discharge Flow-Low (Bypass)	4, 5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 770 gpm and ≤ 930 gpm
e.	Manual Initiation	4, 5	1 per subsystem (a)	E	SR 3.3.5.2.3	N/A
2.	LPCI B and LPCI C Subsystems					
a.	LPCI B and C Differential Pressure-Low (Injection Permissive)	4, 5	1(a)	C	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 70 psid and ≤ 150 psid
b.	LPCI Pump B and LPCI Pump C Discharge Flow-Low (Bypass)	4, 5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 770 gpm and ≤ 930 gpm
c.	Manual Initiation	4, 5	1 per subsystem	E	SR 3.3.5.2.3	N/A

(continued)

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

Table 3.3.5.2-1 (page 2 of 2)
RPV Water Inventory Control Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3.	High Pressure Core Spray (HPCS) System					
	a. Pump Suction Pressure-Low	4[(b)], 5[(b)]	1(a)	D	SR 3.3.5.2.1 SR 3.3.5.2.2	≥94.5 inches H_2O
	b. HPCS Pump Discharge Pressure-High (Bypass)	4, 5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 220 psig
	c. HPCS System Flow Rate-Low (Bypass)	4, 5	1 per pump (a)	E	SR 3.3.5.2.1 SR 3.3.5.2.2	> 580 gpm and ≤ 720 gpm
1 4.	RHR System Isolation					
	a. Reactor Vessel Water Level-Low, Level 3	(a) (c)	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	(a) (c)	2 in one Trip system	B	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 101.8 inches

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	F.1 Isolate the affected penetration flow path(s).	1 hour
G. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	G.1 Isolate the affected penetration flow path(s).	24 hours
H. Required Action and associated Completion Time of Condition F or G not met. OR As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	H.1 Be in MODE 3. AND H.2 Be in MODE 4.	12 hours 36 hours
I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	I.1 Declare associated standby liquid control (SLC) subsystem inoperable. OR I.2 Isolate the Reactor Water Cleanup (RWCU) System.	1 hour 1 hour
J. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	J.1 Initiate action to restore channel to OPERABLE status. ~~OR~~	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~J. (continued)~~	~~J.2 Initiate action to isolate the Residual Heat Removal (RHR) Shutdown Cooling (SDC) System.~~	~~Immediately~~

3.3 INSTRUMENTATION

3.3.8.1 Loss of Power (LOP) Instrumentation

LCO 3.3.8.1 The LOP instrumentation for each Function in Table 3.3.8.1-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
~~When the associated diesel generator (DG) is required to be OPERABLE by LCO 3.8.2, "AC Sources – Shutdown."~~

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Place channel in trip.	1 hour OR ---------NOTE--------- Not applicable when trip capability is not maintained. ---------- In accordance with the Risk Informed Completion Time Program
B. Required Action and associated Completion Time not met.	B.1 Declare associated DG inoperable.	Immediately

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

3.5.1 ECCS – Operating

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

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

High Pressure Core Spray (HPCS)

ACTIONS

---------- NOTE ----------
LCO 3.0.4.b is not applicable to ~~HPCS~~.

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

(continued)

ACTIONS (continued)

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

(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify DRAIN TIME ≥ 36 hours.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.2	Verify, for a required low pressure ECCS injection/spray subsystem, the suppression pool water level is ≥ 195 ft.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	Verify, for a required High Pressure Core Spray (HPCS) System, the: a. Suppression pool water level is ≥ 195 ft. OR b. Condensate storage tank B water level is ≥ 26.9 ft.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify, for the required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
~~SR 3.5.2.5~~	~~----------NOTE---------- Not required to be met for system vent paths opened under administrative control. ---------- Verify, for the required ECCS injection/spray subsystem each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.~~	~~In accordance with the Surveillance Frequency Control Program~~

(~~(~~continued)

----------NOTES----------
1. Operation may be through the test return line.
2. Credit may be taken for normal system operation that satisfies this SR.

SURVEILLANCE REQ

	SURVEILLANCE	FREQUENCY
SR 3.5.2.~~6~~ 5	----------~~NOTE~~---------- ~~Not required to be met for ECCS pumps aligned for shutdown cooling.~~ ---------- Operate the required ECCS injection/spray subsystem ~~through the recirculation line~~ for ≥ 10 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.~~7~~ 6	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.~~8~~ 7	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify ~~the required LPCI or LPCS subsystem actuates on a manual initiation signal or~~ the required ~~HPCS~~ subsystem can be manually operated.	In accordance with the Surveillance Frequency Control Program

ECCS injection/spray

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, SR 3.8.1.13, SR 3.8.1.14 and SR 3.8.1.16.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.2.1 ~~---------- NOTES ----------~~ ~~1. The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.7 through SR 3.8.1.9, SR 3.8.1.11 through SR 3.8.1.14, SR 3.8.1.16, and SR 3.8.1.17.~~ ~~2. SR 3.8.1.10 and SR 3.8.1.17 are not required to be met when associated ECCS subsystem(s) are not required to be OPERABLE per LCO 3.5.2, "RPV Water Inventory Control."~~ ~~----------~~ ~~For AC sources required to be OPERABLE, the SRs of Specification 3.8.1, except SR 3.8.1.15 and SR 3.8.1.18, are applicable.~~	In accordance with applicable SRs

The following SRs are applicable for AC sources required to be OPERABLE:
SR 3.8.1.1
SR 3.8.1.2
SR 3.8.1.3
SR 3.8.1.4
SR 3.8.1.5
SR 3.8.1.6
SR 3.8.1.7
SR 3.8.1.8
SR 3.8.1.12
SR 3.8.1.14

ATTACHMENT 3

Technical Specification Bases Marked Up Pages

These TS Bases markups supersede, in its entirety,
the TS Bases markups submitted in Reference 1

TS Bases Marked Up Pages

B 3.3.5.2-1 thru -10
B 3.3.5.2-11 (provided for completeness)
B 3.3.5.2-12
B 3.3.6.1-33
B 3.3.8.1-4 thru -7
B 3.5.2-1 (provided for completeness)
B 3.5.2-2
B 3.5.2-3 and -4 (provided for completeness)
B 3.5.2-5 thru -9
B 3.5.3-7
B 3.8.2-3 and -4
B 3.8.4-7

B 3.3 INSTRUMENTATION

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

BASES

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.

considered

considered

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, 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 MODES 4 and 5, one ECCS injection/spray subsystem can be manually initiated to maintain adequate reactor vessel water level.

an

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)

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

A.1, A.2.1, and A.2.2

ACTIONS
(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 A.2.1 requires that

~~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.

A

A.2.2

~~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)

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 or 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.

The following SRs apply to each RPV Water Inventory Control instrument Function in Table 3.3.5.2-1.

(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~~

6.

~~7.~~ NEDC-30851-P-A, Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation, "March 1989

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)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.a, 1.b, 2.a, 2.b. 4.16 kV Emergency Bus Undervoltage (Loss of Voltage) (continued)

Three channels of Division 1, 2 and 3, 4.16 kV Emergency Bus Undervoltage (Loss of Voltage) – 4.16 kV Basis Function per associated emergency bus are available, but only two channels of Loss of Voltage – 4.16 kV Basis per 4.16 kV emergency bus is required to be OPERABLE when the associated DG is required to be OPERABLE. One channel of Loss of Voltage – Time Delay Function per associated emergency bus is available and required to be OPERABLE when the associated DG is required to be OPERABLE. These requirements ensure that no single instrument failure can preclude the DG function (Since a failure of a required loss of voltage channel or a time delay channel will only impact the ability of one of the three DGs to start, and only two DGs are credited in the accident analyses, the DG function is still maintained). Refer to LCO 3.8.1, "AC Sources – Operating~~,~~" ~~and LCO 3.8.2, "AC Sources – Shutdown,"~~ for Applicability Bases for the DGs.

1.c, 1.d, 1.e, 2.c, 2.d. 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)

A reduced voltage condition on a 4.16 kV emergency bus indicates that while offsite power may not be completely lost to the respective emergency bus, power may be insufficient for starting large motors without risking damage to the motors that could disable the ECCS function. Therefore, power supply to the bus is transferred from offsite power to onsite DG power prior to the voltage on the bus dropping below the minimum Degraded Voltage Function Allowable Value but after the voltage drops below the maximum Degraded Voltage Function Allowable Value (degraded voltage with a time delay). This ensures that adequate power will be available to the required equipment.

The Bus Undervoltage Allowable Values are low enough to prevent inadvertent power supply transfer, but high enough to ensure that sufficient power is available to the required equipment. The Time Delay Allowable Values are long enough to provide time for the offsite power supply to recover to normal voltages, but short enough to ensure that sufficient power is available to the required equipment.

Three channels of the Division 1, 2 and 3, 4.16 kV Emergency Bus Undervoltage (Degraded Voltage) – 4.16 kV Basis Function

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.c, 1.d, 1.e, 2.c, 2.d. 4.16 kV Emergency Bus Undervoltage (Degraded Voltage) (continued)

per associated emergency bus are available, but only two channels of the Degraded Voltage – 4.16 kV Basis per 4.16 kV emergency bus are required to be OPERABLE when the associated DG is required to be OPERABLE. One channel of each Division 1 and 2 Degraded Voltage – Time Delay, No LOCA Function and Degraded Voltage – Time Delay, LOCA Function per associated emergency bus, is available and required to be OPERABLE when the associated DG is required to be OPERABLE. One channel of the Division 3 Degraded Voltage – Time Delay Function is available and required to be OPERABLE when the associated DG is required to be OPERABLE. These requirements ensure that no single instrument failure can preclude the DG function (Since a failure of a required degraded voltage channel or a time delay channel will only impact the ability of one of the three DGs to start, and only two DGs are credited in the accident analyses, the DG function is still maintained). Refer to LCO 3.8.1 ~~and LCO 3.8.2~~ for Applicability Bases for the DGs.

ACTIONS

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

A.1

With one or more required channels of a Function inoperable, the Function may not be capable of performing the intended function. Therefore, only 1 hour is allowed to restore the inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the

(continued)

BASES

ACTIONS

A.1 (continued)

allowable out of service time, the channel must be placed in the tripped condition per Required Action A.1. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the channel in trip would result in a DG initiation), Condition B must be entered and its Required Action taken.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

B.1

If any Required Action and associated Completion Time is not met, the associated Function may not be capable of performing the intended function. Therefore, the associated DG(s) are declared inoperable immediately. This requires entry into applicable Conditions and Required Actions of LCO 3.8.1 ~~and LCO 3.8.2,~~ which ~~provide~~ provides appropriate actions for the inoperable DG(s).

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs for each LOP Instrumentation Function are located in the SRs column of Table 3.3.8.1-1.

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 2 hours provided the associated Function maintains LOP initiation capability. LOP initiation capability is maintained provided bus load shedding control scheme can be initiated by the Loss of Voltage or Degraded Voltage Functions for two of the three 4.16 kV emergency buses. Upon completion of the Surveillance, or expiration of the 2 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.1.1

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the channel will perform the intended function. 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.

SR 3.3.8.1.2

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

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

SR 3.3.8.1.3

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required actuation logic for a specific channel. The system functional testing performed in LCO 3.8.1 ~~and LCO 3.8.2~~ overlaps this Surveillance to provide complete testing of the assumed safety functions.

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

(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

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.

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.

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 ≥ 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

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 ≥ 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 ≥ 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 eslish 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 ≥ 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 ≥ 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.

The exclusion of penetration flow paths from the determination of DRAIN TIME ~~must~~ 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.~~

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)

, 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 consistant 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."

a single

should

temporary alterations in support of maintenance

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.2 and SR 3.5.2.3 (Continued)

the CST contains ≥ 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~~ actuation. 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.

~~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

BASES

aligned, and the pump

may be done

SURVEILLANCE REQUIREMENTS (continued)

test return line

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

can be manually aligned and started from the control room, including any necessary valve alignment, instrumentation, or controls, to transfer water from the suppression pool or CST to the RPV.

SR 3.5.2.~~6~~ 5

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~~ 6

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~~ 7

~~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

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. 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.

3

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

the ability to manually start a

ensures

LCO
(continued)

a separate offsite circuit to the Division 3 Class 1E onsite electrical power distribution subsystem, or an OPERABLE Division 3 DG, ensures an additional source of power for the HPCS. This additional source for Division 3 is not necessarily required to be connected to be OPERABLE. Either the circuit required by LCO Item a., or a circuit required to meet LCO Item c. may be connected, with the second source available for connection. Together, OPERABILITY of the required offsite circuit(s) and DG(s) ~~ensure~~ the availability of sufficient AC sources to operate the plant in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents, reactor vessel draindown).

The qualified offsite circuit(s) must be capable of maintaining rated frequency and voltage while connected to their respective emergency bus(es), and of accepting required loads during an accident. Qualified offsite circuits are those that are described in the USAR and are part of the licensing basis for the plant. The offsite circuit from the 345 kV/115 kV Scriba Substation consists of the incoming breaker and disconnect to the respective reserve station service transformers 2RTX-XSR1A and 2RTX-XSR1B and auxiliary boiler transformer 2ABS-X1, the respective 2RTX-XSR1A, 2RTX-XSR1B, and 2ABS-X1 transformers, and the respective circuit path including feeder breakers to all 4.16 kV emergency buses required by LCO 3.8.9.

being manually started

The required DG must be capable of ~~starting~~, accelerating to rated speed and voltage, and connecting to its respective emergency bus ~~on detection of bus undervoltage~~, and accepting required loads. ~~This sequence must be accomplished within 13.20 seconds. The start time includes the 3.20 second Loss of Voltage—Time Delay Function Allowable Value specified in LCO 3.3.8.1, "Loss of Power (LOP) Instrumentation." Each DG must also be capable of accepting required loads within the assumed loading sequence intervals, and must continue to operate until offsite power can be restored to the emergency buses. These capabilities are required to be met from a variety of initial conditions such as: DG in standby with the engine hot and DG in standby with the engine at ambient conditions. Additional DG capabilities must be demonstrated to meet required Surveillances, e.g., capability of the DG to revert to standby status on an ECCS signal while operating in parallel test mode.~~

(continued)

BASES

LCO (~~continued~~)

~~Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY.~~ The necessary portions of the Service Water System and Ultimate Heat Sink capable of providing cooling to the required DG(s) are ~~also~~ required. ~~In addition, proper sequencing of loads is a required function for offsite circuit OPERABILITY.~~

It is acceptable for divisions to be cross tied during shutdown conditions, permitting a single offsite power circuit to supply all required divisions.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 4 and 5 and during movement of irradiated fuel assemblies in the secondary containment provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core in case of an inadvertent draindown of the reactor vessel;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, and 3 are covered in LCO 3.8.1.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 4 or 5. However, since irradiated fuel assembly movement can occur in MODE 1, 2, or 3, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Entering LCO 3.0.3 while in MODE 1, 2, or 3 would require the unit to be shutdown, but would not require

(continued)

SR 3.8.1.9, SR 3.8.1.10, SR 3.8.1.11, SR 3.8.1.13, SR 3.8.1.16 and SR 3.8.1.17 are not required to be met because DG start and load within a specified time and response on an offsite power or ECCS initiation signal is not required.

SURVEILLANCE REQUIREMENTS

SR 3.8.2.1

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.

a Note which precludes

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).

ATTACHMENT 4

Optional Changes and Variations

The Optional Changes and Variations supersede,
in its entirety, Section 2.2 in Reference 1

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.

In some cases, 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 and SRs in 3.8.1 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 does not contain Actions E.1 or E.2 as shown in TSTF-582, Revision 0, for TS 3.3.5.2, Condition E. NMP2 Conditions E and F are the same as TSTF-582, Revision 0, Conditions F and G, and are deleted in accordance with the TSTF. This is an administrative variation and do not affect the applicability of TSTF-582 to the NMP2 TS.

TSTF-583-T provides further TS clarifications that TSTF-582 did not include to reflect that TS 3.8.2 should not require automatic start and loading of a diesel generator within 10 seconds on an ECCS initiation signal or a loss of offsite power signal. Therefore, changes from TSTF-583-T are included as the following variations:

- TS 3.3.8.1, "Loss of Power (LOP) Instrumentation," is applicable when the associated diesel generator is required to be operable. TSTF-582 revised TS 3.8.2 to no longer require automatic start and loading of a diesel generator on a loss of offsite power signal. Consequently, the LOP instrumentation that generates the loss of offsite power signal should not be required to be operable when the diesel generator is required to be operable by TS 3.8.2. The Applicability of LCO 3.3.8.1 is revised to delete "When associated diesel generator is required to be OPERABLE by LCO 3.8.2, AC Sources-Shutdown."

- SR 3.8.2.1 requires TS SR 3.8.1.7 and SR 3.8.1.15 to be met. For NMP2, the comparable SRs are SR 3.8.1.2 and SR 3.8.1.13 require that the DG starts from standby or hot conditions, respectively, and achieves required voltage and frequency within 10 seconds. The 10 second start requirement supports the assumptions in the design basis LOCA analysis. This capability is not required during a manual diesel generator start to respond to a draining event, which has a minimum Drain Time of one hour. Therefore, SR 3.8.2.1 is revised to add SR 3.8.1.2 and SR 3.8.1.13 to the list of TS 3.8.1 SRs that are not applicable for AC sources to be Operable.

- SR 3.8.2.1 requires SR 3.8.1.18 to be met but not performed. For NMP2, the comparable SR is SR 3.8.1.16. SR 3.8.1.16 states, "Verify interval between each sequenced load block, for the Division 1 and 2 DGs only, is ≥ 90% of the design interval for each automatic load sequence time delay relay." The load sequencer is only used for the automatic start and loading of the diesel generator is not used during a manual diesel generator start. Therefore, SR 3.8.2.1 is revised to add SR 3.8.1.16 to the list of TS 3.8.1 SRs that are not applicable for AC sources to be Operable.

- As an editorial improvement identified in TSTF-583-T, SR 3.8.2.1 is revised to list the TS 3.8.1 SRs that are applicable instead of the TS 3.8.1 SRs that are not applicable. This has no effect on the requirements. The SR 3.8.2.1 Bases continue to explain why certain TS 3.8.1 SRs are omitted from the list.

SR 3.5.2.6 is renumbered to SR 3.5.2.5 in accordance with TSTF-582, Revision 0. The renumbered SR 3.5.2.5 currently contains a Note "Not required to be met for ECCS pumps aligned for shutdown cooling." This Note is deleted as the new Note 2 allows to take credit for normal system operation that satisfies this SR. The deletion of the Note is a variation to TSTF-582 and aligns NMP2 TS with the TSTF.

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.

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.