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RS-20-002 10 CFR 50.90

February 6, 2020

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

Braidwood Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. 50-456 and 50-457

Byron Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. 50-454 and 50-455

R.E. Ginna Nuclear Power Plant
Renewed Facility Operating License No. DPR-18
NRC Docket No. 50-244

Subject: Application to Revise Technical Specifications to Adopt TSTF-567, "Add Containment Sump TS to Address GSI-191 Issues"

Reference: 1. Final Safety Evaluation of Technical Specifications Task Force Traveler TSTF-567, Revision 1, "Add Containment Sump TS to Address GSI-191 Issues," using the Consolidated Line Item Improvement Process, dated July 3, 2018 (EPID: L-2017-PMP-0005)

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (EGC) is submitting a request for an amendment to the Technical Specifications (TS) for Renewed Facility Operating License Nos. NPF-72 and NPF-77 for Braidwood Station, Units 1 and 2 (Braidwood), Renewed Facility Operating License Nos. NPF-37 and NPF-66 for Byron Station, Units 1 and 2 (Byron), and Renewed Facility Operating License No. DPR-18 for R.E. Ginna Nuclear Power Plant (Ginna).

EGC requests adoption of TSTF-567, "Add Containment Sump TS to Address GSI-191 Issues," which is an approved change to the Improved Standard Technical Specifications (ISTS), into the Braidwood Station, Byron Station, and Ginna Nuclear Power Plant Technical Specifications (TS). The proposed amendment adds a new TS 3.6.8, "Containment Sump," for Braidwood and Byron and TS 3.6.7, "Containment Sump," for Ginna and adds an Action to address the condition of the containment sump made inoperable due to containment accident generated and transported debris exceeding the analyzed limits. The Action provides time to correct or evaluate the condition in lieu of an immediate plant shutdown.

Attachment 1 provides a description and assessment of the proposed changes. Attachments 2a, 2b, and 2c provide existing TS pages marked to show the proposed changes. Attachments 3a, 3b, and 3c provide existing TS Bases pages marked to show the proposed changes for information only.

The proposed change has been reviewed by Braidwood, Byron, and Ginna Plant Operations Review Committees in accordance with the requirements of the EGC Quality Assurance Program.

Approval of the proposed amendment is requested by August 6, 2020. Once approved, the amendment shall be implemented within 60 days.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), EGC is notifying the States of Illinois and New York of this supplement to the application for license amendment by transmitting a copy of this letter and its attachment to the designated State Official.

This letter contains no regulatory commitments. Should you have any questions concerning this letter, please contact Ms. Lisa Zurawski at (630) 657-2816.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 6th day of February 2020.

Respectfully,

Dwi Murray
Sr. Manager – Licensing
Exelon Generation Company, LLC

Attachments:
1. Description and Assessment
2a. Proposed Technical Specification Changes (Mark-Up) for Braidwood Station
2b. Proposed Technical Specification Changes (Mark-Up) for Byron Station
2c. Proposed Technical Specification Changes (Mark-Up) for Ginna Station
3a. Proposed Technical Specification Bases Changes (Mark-Up) for Information Only for Braidwood Station
3b. Proposed Technical Specification Bases Changes (Mark-Up) for Information Only for Byron Station
3c. Proposed Technical Specification Bases Changes (Mark-Up) for Information Only for Ginna Station

cc: NRC Regional Administrator, Region I
NRC Regional Administrator, Region III
NRC Senior Resident Inspector – Braidwood Station
NRC Senior Resident Inspector – Byron Station
NRC Senior Resident Inspector – Ginna Station
Illinois Emergency Management Agency – Division of Nuclear Safety
A.L. Peterson, NYSERDA

ATTACHMENT 1
Description and Assessment

Subject: Application to Revise Technical Specifications to Adopt TSTF-567, "Add Containment Sump TS to Address GSI-191 Issues"

ATTACHMENT 1
Description and Assessment

1.0 DESCRIPTION

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit or early site permit," Exelon Generation Company, LLC, (EGC) requests amendments to Renewed Facility Operating License Nos. NPF-72 and NPF-77 for Braidwood Station, Units 1 and 2, (Braidwood), Renewed Facility Operating License Nos. NPF-37 and NPF-66 for Byron Station, Units 1 and 2 (Byron), and Renewed Facility Operating License No. DPR-18 for R.E. Ginna Nuclear Power Plant (Ginna). EGC requests adoption of Technical Specifications Task Force (TSTF)-567, "Add Containment Sump TS to Address GSI-191 Issues," which is an approved change to the Improved Standard Technical Specifications (ISTS), into the Braidwood Station, Byron Station, and Ginna Nuclear Power Plant Technical Specifications (TS).

The proposed amendment adds a new Technical Specification (TS) 3.6.8, "Containment Sump," for Braidwood and Byron and TS 3.6.7, "Containment Sump," for Ginna and adds an Action to address the condition of the containment sump made inoperable due to containment accident generated and transported debris exceeding the analyzed limits. The Action provides time to correct or evaluate the condition in lieu of an immediate plant shutdown. This Action is placed in a new specification on the containment sump that otherwise retains the existing Technical Specifications requirements. An existing Surveillance Requirement (SR) is moved from TS 3.5.2 to the new specification. The requirement to perform the SR in TS 3.5.3 is deleted.

The proposed amendment also revises the Safety Function Determination Program (SFDP) to clarify its application when a supported system is made inoperable by the inoperability of a single Technical Specification support system.

2.0 ASSESSMENT

2.1 Applicability of Safety Evaluation

EGC has reviewed the safety evaluation for TSTF-567 provided to the Technical Specifications Task Force (TSTF) in a letter dated July 3, 2018. This review included the NRC staff's evaluation, as well as the information provided in TSTF-567. EGC has concluded that the justifications presented in TSTF-567 and the safety evaluation prepared by the NRC staff are applicable to Braidwood Station, Units 1 and 2, Byron Station, Units 1 and 2 and Ginna Nuclear Power Plant and justify this amendment for the incorporation of the changes to the Braidwood, Byron, and Ginna TS.

2.2 Variations

EGC is proposing the following variations from the TS changes described in the TSTF-567 or the applicable parts of the NRC staff's safety evaluation. These variations do not affect the applicability of TSTF-567 or the NRC staff's safety evaluation to the proposed license amendment.

The Braidwood and Byron TS utilize different numbering than the ISTS on which TSTF-567 was based. Specifically, the ISTS has this addition as TS 3.6.19. For Braidwood and Byron, this will be TS 3.6.8. These differences are administrative and do not affect the applicability of TSTF-567 to the Braidwood and Byron TS.

The Ginna TS utilizes different numbering than the ISTS on which TSTF-567 was based. Specifically, the ISTS has this addition as TS 3.6.19. For Ginna, this will be TS 3.6.7. Additionally, the ISTS has TS 5.5.15 Safety Function Determination Program (SFDP). For Ginna, the SFDP is TS 5.5.14. Furthermore, the second Note from Action B of TS 3.6.7 has been removed since Ginna is not designed to have the Containment Spray pumps take suction from the Containment Sump. These differences are administrative and do not affect the applicability of TSTF-567 to the Ginna TS.

The Braidwood, Byron and Ginna Technical Specifications contain a Surveillance Frequency Control Program. Therefore, the Frequency for Surveillance Requirement (SR) 3.6.8.1 for Braidwood and Byron and SR 3.6.7.1 for Ginna is "In accordance with the Surveillance Frequency Control Program."

3.0 REGULATORY ANALYSIS

3.1 No Significant Hazards Consideration Analysis

The proposed amendment adds a new Technical Specification (TS) 3.6.8, "Containment Sump," for Braidwood and Byron and TS 3.6.7, "Containment Sump," for Ginna and adds an Action to address the condition of the containment sump made inoperable due to containment accident generated and transported debris exceeding the analyzed limits. The Action provides time to correct or evaluate the condition in lieu of an immediate plant shutdown. This Action is placed in a new specification on the containment sump that otherwise retains the existing Technical Specifications requirements. An existing Surveillance Requirement (SR) is moved from TS 3.5.2 to the new specification. The requirement to perform the SR in TS 3.5.3 is deleted.

The proposed amendment also revises the Safety Function Determination Program (SFDP) to clarify its application when a supported system is made inoperable by the inoperability of a single Technical Specification support system.

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

1) Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed change adds a new specification to the TS for the containment sump. An existing SR on the containment sump is moved to the new specification and a duplicative requirement to perform the SR in TS 3.5.3 is removed. The new specification retains the existing requirements on the containment sump and the actions to be taken when the containment sump is inoperable with the exception of adding new actions to be taken when the containment sump is inoperable due to containment accident generated and transported debris exceeding the analyzed limits. The new action provides time to evaluate and correct the condition instead of requiring an immediate plant shutdown.

The containment sump is not an initiator of any accident previously evaluated. The containment sump is a passive component and the proposed change does not increase the likelihood of the malfunction. As a result, the probability of an accident is unaffected by the proposed change.

The containment sump is used to mitigate accidents previously evaluated by providing a borated water source for the Emergency Core Cooling System (ECCS) and Containment Spray System (CSS). The design of the containment sump and the capability of the containment sump assumed in the accident analysis is not changed. The proposed action requires implementation of mitigating actions while the containment sump is inoperable and more frequent monitoring of reactor coolant leakage to detect any increased potential for an accident that would require the containment sump. The consequences of an accident during the proposed action are no different than the current consequences of an accident if the containment sump is inoperable.

The proposed change clarifies the SFDP when a supported system is made inoperable by the inoperability of a single Technical Specification support system. The SFDP directs the appropriate use of TS actions and the proposed change does not alter the current intent of the TS. The actions taken when a system is inoperable are not an assumption in the initiation or mitigation of any previously evaluated accident.

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

2) Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed change adds a new specification to the TS for the containment sump. An existing SR on the containment sump is moved to the new specification and a duplicative requirement to perform the SR in TS 3.5.3 is removed. The new specification retains the existing requirements on the containment sump and the actions to be taken when the containment sump is inoperable with the exception of adding new actions to be taken when the containment sump is inoperable due to containment accident generated and transported debris exceeding the analyzed limits. The new action provides time to evaluate and correct the condition instead of requiring an immediate plant shutdown.

The proposed change does not alter the design or design function of the containment sump or the plant. No new systems are installed or removed as part of the proposed change. The containment sump is a passive component and cannot initiate a malfunction or accident. No new credible accident is created that is not encompassed by the existing accident analyses that assume the function of the containment sump.

The proposed change clarifies the SFDP when a supported system is made inoperable by the inoperability of a single Technical Specification support system. The SFDP directs the appropriate use of TS actions and the proposed change does not alter the current intent of the TS. The proposed change to the SFDP will not result in any change to the design or design function of the containment sump or a method of operation of the plant.

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

3) Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

The proposed change adds a new specification to the TS for the containment sump. An existing SR on the containment sump is moved to the new specification and a duplicative requirement to perform the SR in TS 3.5.3 is removed. The new specification retains the existing requirements on the containment sump and the actions to be taken when the containment sump is inoperable with the exception of adding new actions to be taken when the containment sump is inoperable due to containment accident generated and transported debris exceeding the analyzed limits. The new action provides time to evaluate and correct the condition instead of requiring an immediate plant shutdown.

The proposed change does not affect the controlling values of parameters used to avoid exceeding regulatory or licensing limits. No Safety Limits are affected by the proposed change. The proposed change does not affect any assumptions in the accident analyses that demonstrate compliance with regulatory and licensing requirements.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, EGC concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

3.2 <u>Conclusion</u>

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

4.0 ENVIRONMENTAL CONSIDERATION

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

Attachment 2a

Braidwood Station, Units 1 and 2
NRC Docket Nos. 50-456 and 50-457

Proposed Technical Specification Changes (Mark-Up)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.3	Verify ECCS locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.5.2.5	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.7	Verify, for each ECCS throttle valve listed below, each position stop is in the correct position: <u>Valve Number</u> — <u>Valve Function</u> SI8810 A,B,C,D — Centrifugal Charging System SI8816 A,B,C,D — SI System (Hot Leg) SI8822 A,B,C,D — SI System (Cold Leg)	In accordance with the Surveillance Frequency Control Program
~~SR 3.5.2.8~~	~~Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet screens show no evidence of structural distress or abnormal corrosion.~~	~~In accordance with the Surveillance Frequency Control Program~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	The following SRs are applicable for all equipment required to be OPERABLE: SR 3.5.2.1 SR 3.5.2.7 SR 3.5.2.3 ~~SR 3.5.2.8~~. SR 3.5.2.4	In accordance with applicable SRs

5.5.15 Safety Function Determination Program (SFDP) (continued)

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

When a loss of safety function is caused by the inoperability of a single Technical Specification support system, the appropriate Conditions and Required Actions to enter are those of the support system.

5.5.16 Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, September 1995 and NEI 94-01, Revision 0.

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 42.8 psig for Unit 1 and 38.4 psig for Unit 2

The maximum allowable containment leakage rate, L_a, at P_a, shall be 0.20% of containment air weight per day.

Leakage Rate acceptance criteria are:

a. Containment leakage rate acceptance criterion is $\leq 1.0\ L_a$. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $< 0.60\ L_a$ for the Type B and C tests and $< 0.75\ L_a$ for Type A tests; and

3.6 CONTAINMENT SYSTEMS

3.6.8 ~~(Deleted)~~ Containment Sump

LCO 3.6.8 Two containment sumps shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment sump(s) inoperable due to containment accident generated and transported debris exceeding the analyzed limits.	A.1 Initiate action to mitigate containment accident generated and transported debris.	Immediately
	AND	
	A.2 Perform SR 3.4.13.1.	Once per 24 hours
	AND	
	A.3 Restore the containment sump(s) to OPERABLE status.	90 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One or more containment sump(s) inoperable for reasons other than Condition A.	B.1	--------------NOTES------------- 1. Enter applicable Conditions and Required Actions of LCO 3.5.2, "ECCS - Operating," and LCO 3.5.3, "ECCS - Shutdown," for emergency core cooling trains made inoperable by the containment sump(s). 2. Enter applicable Conditions and Required Actions of LCO 3.6.6, "Containment Spray and Cooling Systems," for containment spray trains made inoperable by the containment sump(s). -------------------------------------	
		Restore the containment sump(s) to OPERABLE status.	7 days
C. Required Action and associated Completion Time not met.	C.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	C.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.8.1	Verify, by visual inspection, the containment sump(s) do not show structural damage, abnormal corrosion, or debris blockage.	In accordance with the Surveillance Frequency Control Program

Attachment 2b

Byron Station, Units 1 and 2
NRC Docket Nos. 50-454 and 50-455

Proposed Technical Specification Changes (Mark-Up)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.3	Verify ECCS locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.5.2.5	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.7	Verify, for each ECCS throttle valve listed below, each position stop is in the correct position: Valve Number — Valve Function SI8810 A,B,C,D — Centrifugal Charging System SI8816 A,B,C,D — SI System (Hot Leg) SI8822 A,B,C,D — SI System (Cold Leg)	In accordance with the Surveillance Frequency Control Program
~~SR 3.5.2.8~~	~~Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet screens show no evidence of structural distress or abnormal corrosion.~~	~~In accordance with the Surveillance Frequency Control Program~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	The following SRs are applicable for all equipment required to be OPERABLE: SR 3.5.2.1 SR 3.5.2.7 SR 3.5.2.3 ~~SR 3.5.2.8~~. SR 3.5.2.4	In accordance with applicable SRs

3.6 CONTAINMENT SYSTEMS

3.6.8 ~~(Deleted)~~ Containment Sump

LCO 3.6.8 Two containment sumps shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment sump(s) inoperable due to containment accident generated and transported debris exceeding the analyzed limits.	A.1 Initiate action to mitigate containment accident generated and transported debris.	Immediately
	<u>AND</u>	
	A.2 Perform SR 3.4.13.1.	Once per 24 hours
	<u>AND</u>	
	A.3 Restore the containment sump(s) to OPERABLE status.	90 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One or more containment sump(s) inoperable for reasons other than Condition A.	B.1	--------------NOTES------------- 1. Enter applicable Conditions and Required Actions of LCO 3.5.2, "ECCS - Operating," and LCO 3.5.3, "ECCS - Shutdown," for emergency core cooling trains made inoperable by the containment sump(s). 2. Enter applicable Conditions and Required Actions of LCO 3.6.6, "Containment Spray and Cooling Systems," for containment spray trains made inoperable by the containment sump(s). ---------------------------------------	
		Restore the containment sump(s) to OPERABLE status.	7 days
C. Required Action and associated Completion Time not met.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.8.1	Verify, by visual inspection, the containment sump(s) do not show structural damage, abnormal corrosion, or debris blockage.	In accordance with the Surveillance Frequency Control Program

5.5 Programs and Manuals

5.5.15 Safety Function Determination Program (SFDP) (continued)

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

When a loss of safety function is caused by the inoperability of a single Technical Specification support system, the appropriate Conditions and Required Actions to enter are those of the support system.

5.5.16 Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, September 1995 and NEI 94-01, Revision 0.

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 42.8 psig for Unit 1 and 38.4 psig for Unit 2

The maximum allowable containment leakage rate, L_a, at P_a, shall be 0.20% of containment air weight per day.

Leakage Rate acceptance criteria are:

a. Containment leakage rate acceptance criterion is $\leq 1.0\ L_a$. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $< 0.60\ L_a$ for the Type B and C tests and $< 0.75\ L_a$ for Type A tests; and

Attachment 2c

R.E. Ginna Nuclear Power Plant NRC Docket No. 50-244

Proposed Technical Specification Changes (Mark-Up)

	SURVEILLANCE	FREQUENCY
SR 3.5.2.3	Verify each breaker or key switch, as applicable, for each valve listed in SR 3.5.2.1, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.5.2.5	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
~~SR 3.5.2.7~~	~~Verify, by visual inspection, each RHR containment sump suction inlet is not restricted by debris and the containment sump screen shows no evidence of structural distress or abnormal corrosion.~~	~~In accordance with the Surveillance Frequency Control Program~~
SR 3.5.2.~~8~~ 7	Verify ECCS locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.3.1	- NOTE - An RHR train may be considered OPERABLE during alignment and operation for decay heat removal, if capable of being manually realigned to the ECCS mode of operation. SR 3.5.2.4 and SR ~~3.5.28~~ 3.5.2.7 are applicable for all equipment required to be OPERABLE.	In accordance with applicable SR

3.6 CONTAINMENT SYSTEMS

3.6.7 Containment Sump

LCO 3.6.7 The containment sump shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment sump inoperable due to containment accident generated and transported debris exceeding the analyzed limits.	A.1 Initiate action to mitigate containment accident generated and transported debris.	Immediately
	AND	
	A.2 Perform SR 3.4.13.1.	Once per 24 hours
	AND	
	A.3 Restore the containment sump to OPERABLE status.	90 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Containment sump inoperable for reasons other than Condition A.	B.1	--------------NOTES------------- 1. Enter applicable Conditions and Required Actions of LCO 3.5.2, "ECCS – MODES 1, 2, and 3," and LCO 3.5.3, "ECCS – MODE 4," for emergency core cooling trains made inoperable by the containment sump. ------------------------------------- Restore the containment sump to OPERABLE status.	72 hours
C. Required Action and associated Completion Time not met.	C.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	C.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.1	Verify, by visual inspection, the containment sump does not show structural damage, abnormal corrosion, or debris blockage.	In accordance with the Surveillance Frequency Control Program

b. A required system redundant to the system(s) in turn supported by the inoperable supported system is also inoperable; or

c. A required system redundant to the inoperable support system(s) for the supported systems (a) and (b) above is also inoperable.

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

When a loss of safety function is caused by the inoperability of a single Technical Specification support system, the appropriate Conditions and Required Actions to enter are those of the support system.

5.5.15 Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, as modified by the following exception to NEI 94-01, Rev. 0, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50, Appendix J":

a. Section 9.2.3: The first Type A test performed after the May 31, 1996 Type A test shall be performed by May 31, 2011.

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 60 psig.

The maximum allowable primary containment leakage rate, L_a, at P_a, shall be 0.2% of containment air weight per day.

Leakage Rate acceptance criteria are:

a. Containment leakage rate acceptance criterion is $\leq 1.0\ L_a$. During the first plant startup following testing in accordance with this program, the leakage rate acceptance criteria are $\leq 0.60\ L_a$ for the Type B and Type C tests and $\leq 0.75\ L_a$ for Type A tests;

b. Air lock testing acceptance criteria are:

   1. For each air lock, overall leakage rate is $\leq 0.05\ L_a$ when tested at $\geq P_a$, and

   2. For each door, leakage rate is $\leq 0.01\ L_a$ when tested at $\geq P_a$.

Attachment 3a

Braidwood Station, Units 1 and 2
NRC Docket Nos. 50-456 and 50-457

Proposed Technical Specification Bases Changes (Mark-Up) for Information Only

BASES

BACKGROUND (continued)

During the recirculation phase of LOCA recovery, RHR pump suction is transferred to the containment sump. The RHR pumps then supply the other ECCS pumps. Initially, recirculation is through the same paths as the injection phase, i.e., through the cold legs. After approximately 6.0 hours, the ECCS flow is shifted to the hot legs.

The centrifugal charging subsystem of the ECCS also functions to supply borated water to the reactor core following increased heat removal events, such as a Main Steam Line Break (MSLB). The limiting design conditions occur when the negative moderator temperature coefficient is highly negative, such as at the end of each cycle.

During low temperature conditions in the RCS, limitations are placed on the maximum number of ECCS pumps that may be OPERABLE. Refer to the Bases for LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," for the basis of these requirements.

The ECCS subsystems are actuated upon receipt of an SI signal. The actuation of safeguard loads is accomplished in a programmed time sequence. If offsite power is available, the safeguard loads start immediately in the programmed sequence. If offsite power is not available, the Engineered Safety Feature (ESF) buses shed normal operating loads and are connected to the emergency Diesel Generators (DGs). Safeguard loads are then actuated in the programmed time sequence. The time delay associated with diesel starting, sequenced loading, and pump starting determines the time required before pumped flow is available to the core following a LOCA.

, the RWST, and the containment sump(s), are

The active ECCS components, along with the passive accumulators ~~and the RWST~~ covered in LCO 3.5.1, "Accumulators," ~~and~~ LCO 3.5.4, "Refueling Water Storage Tank (RWST)," provide the cooling water necessary to meet GDC 35 (Ref. 1).

and LCO 3.6.8, "Containment Sump," and

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.5

This Surveillance demonstrates that each automatic ECCS valve actuates to the required position on an actual or simulated SI signal (a coincident RWST Level Low-Low signal is required to open the containment sump isolation valves). This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The actuation logic is tested as part of ESF Actuation System testing, and equipment performance is monitored as part of the INSERVICE TESTING PROGRAM.

SR 3.5.2.6

This Surveillance demonstrates that each ECCS pump starts on receipt of an actual or simulated SI signal. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The actuation logic is tested as part of ESF Actuation System testing, and equipment performance is monitored as part of the INSERVICE TESTING PROGRAM.

SR 3.5.2.7

Realignment of valves in the flow path on an SI signal is necessary for proper ECCS performance. These valves have mechanical stops to allow proper positioning for restricted flow to a ruptured cold leg, ensuring that the other cold legs receive at least the required minimum flow. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~SR 3.5.2.8~~

~~Periodic inspections of the containment sump suction inlet ensure that it is unrestricted and stays in proper operating condition. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.3 ECCS-Shutdown

BASES

BACKGROUND

The Background section for Bases 3.5.2, "ECCS-Operating," is applicable to these Bases, with the following modifications.

In MODE 4, the required ECCS train consists of two separate subsystems: centrifugal charging (high head) and Residual Heat Removal (RHR) (low head).

and the containment sump

The ECCS flow paths consist of piping, valves, heat exchangers, and pumps such that water from the Refueling Water Storage Tank (RWST) can be injected into the Reactor Coolant System (RCS) following the accidents described in Bases 3.5.2.

APPLICABLE SAFETY ANALYSES

The Applicable Safety Analyses section of Bases 3.5.2 also applies to this Bases section.

Due to the stable conditions associated with operation in MODE 4 and the reduced probability of occurrence of a Design Basis Accident (DBA), the ECCS operational requirements are reduced. It is understood in these reductions that certain automatic Safety Injection (SI) actuation is not available. In this MODE, sufficient time exists for manual actuation of the required ECCS to mitigate the consequences of a DBA.

Only one train of ECCS is required for MODE 4. This requirement dictates that single failures are not considered during this MODE of operation. The ECCS trains satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

B 3.6 CONTAINMENT SYSTEMS

B 3.6.8 ~~(Deleted)~~ Containment Sump

BASES

BACKGROUND

The containment sump provides a borated water source to support recirculation of coolant from the containment sump for residual heat removal, emergency core cooling, and containment cooling during accident conditions.

The containment sumps supply both trains of the Emergency Core Cooling System (ECCS) and the Containment Spray System during any accident that requires recirculation of coolant from the containment sumps. The recirculation mode is initiated when the pump suction is transferred to the containment sump on low Refueling Water Storage Tank (RWST) level, which ensures the containment sump has enough water to supply the net positive suction head to the ECCS and Containment Spray System pumps. The containment sumps include two separate sumps, fully redundant, each servicing one train of the ECCS.

The containment sump contains strainers to limit the quantity of the debris materials from entering the sump suction piping. Debris accumulation on the strainers can lead to undesirable hydraulic effects including air ingestion through vortexing or deaeration, and reduced net positive suction head (NPSH) at pump suction piping.

While the majority of debris accumulates on the strainers, some fraction penetrates the strainers and is transported to downstream components in the ECCS, Containment Spray System, and the Reactor Coolant System (RCS). Debris that penetrates the strainer can result in wear to the downstream components, blockages, or reduced heat transfer across the fuel cladding. Excessive debris in the containment sump water source could result in insufficient recirculation of coolant during the accident, or insufficient heat removal from the core during the accident.

BASES

APPLICABLE SAFETY ANALYSIS	During all accidents that require recirculation, the containment sump provides a source of borated water to the ECCS and Containment Spray System pumps. As such, it supports residual heat removal, emergency core cooling, and containment cooling during an accident. It also provides a source of negative reactivity (Ref. 1). The design basis transients and applicable safety analyses concerning each of these systems are discussed in the Applicable Safety Analyses section of B 3.5.2, "ECCS - Operating," B 3.5.3, "ECCS - Shutdown," and B 3.6.6, "Containment Spray and Cooling Systems." UFSAR Section A1.82 (Ref. 2) references evaluations that confirm long-term core cooling is assured following any accident that requires recirculation from the containment sump. The containment sump satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	Two containment sumps are required to ensure a source of borated water to support ECCS and Containment Spray System OPERABILITY. A containment sump consists of the containment drainage flow paths, a trash rack structure, vertical grating on the perimeter and checkered plate on top, protecting the openings for both sumps. The trash rack prevents debris sliding along the floor from reaching the screens, the containment sump strainers, the pump suction trash racks, and the inlet to the ECCS and Containment Spray System piping. An OPERABLE containment sump has no structural damage or abnormal corrosion that could prevent recirculation of coolant and will not be restricted by containment accident generated and transported debris.

BASES

LCO (continued)

Containment accident generated and transported debris consists of the following:

a. Accident generated debris sources - Insulation, coatings, and other materials which are damaged by the high-energy line break (HELB) and transported to the containment sump. This includes materials within the HELB zone of influence and other materials (e.g., unqualified coatings) that fail due to the post-accident containment environment following the accident;

b. Latent debris sources – Pre-existing dirt, dust, paint chips, fines or shards of insulation, and other materials inside containment that do not have to be damaged by the HELB to be transported to the containment sump; and

c. Chemical product debris sources – Aluminum, zinc, carbon steel, copper, and non-metallic materials such as paints, thermal insulation, and concrete that are susceptible to chemical reactions within the post-accident containment environment leading to corrosion products that are generated within the containment sump pool or are generated within containment and transported to the containment sump.

Containment debris limits are listed in analyses referenced in UFSAR Section A1.82 (Ref. 2).

APPLICABILITY

In MODES 1, 2, 3, and 4, containment sump OPERABILITY requirements are dictated by the ECCS and Containment Spray System OPERABILITY requirements. Since both the ECCS and the Containment Spray System must be OPERABLE in MODES 1, 2, 3, and 4, the containment sump must also be OPERABLE to support their operation.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Thus, the containment sump is not required to be OPERABLE in MODES 5 or 6.

BASES

ACTIONS

A.1, A.2, and A.3

Condition A is applicable when there is a condition which results in containment accident generated and transported debris exceeding the analyzed limits. Containment debris limits are listed in analyses referenced in UFSAR Section A1.82 (Ref. 2).

Immediate action must be initiated to mitigate the condition. Examples of mitigating actions are:

- Removing the debris source from containment or preventing the debris from being transported to the containment sump;
- Evaluating the debris source against the assumptions in the analysis;
- Deferring maintenance that would affect availability of the affected systems and other LOCA mitigating equipment;
- Deferring maintenance that would affect availability of primary defense-in-depth systems, such as containment coolers;
- Briefing operators on LOCA debris management actions; or
- Applying an alternative method to establish new limits.

While in this condition, the RCS water inventory balance, SR 3.4.13.1, must be performed at an increased Frequency of once per 24 hours. An unexpected increase in RCS leakage could be indicative of an increased potential for an RCS pipe break, which could result in debris being generated and transported to the containment sumps. The more frequent monitoring allows operators to act in a timely fashion to minimize the potential for an RCS pipe break while the containment sumps are inoperable.

For the purposes of applying LCO 3.0.6 and the Safety Function Determination Program while in Condition A, two containment sumps are considered a single support system for all ECCS and Containment Spray System trains because containment accident generated and transported debris issues that would render one sump inoperable would render all of the sumps inoperable.

The inoperable containment sump(s) must be restored to OPERABLE status in 90 days. A 90-day Completion Time is reasonable for emergent conditions that involve debris in excess of the analyzed limits that could be generated and transported to the containment sump under accident conditions. The likelihood of an initiating event in the 90-day Completion

BASES

ACTIONS (continued)

Time is very small and there is margin in the associated analyses. The mitigating actions of Required Action A.1 provide additional assurance that the effects of debris in excess of the analyzed limits will be mitigated during the Completion Time.

B.1

When the containment sump(s) is inoperable for reasons other than Condition A, such as blockage, structural damage, or abnormal corrosion that could prevent recirculation of coolant, it must be restored to OPERABLE status within 7 days. The 7 day Completion Time takes into account the reasonable time for repairs, and low probability of an accident that requires the containment sump occurring during this period.

Required Action B.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.5.2, "ECCS - Operating," and LCO 3.5.3, "ECCS - Shutdown," should be entered if an inoperable containment sump results in an inoperable ECCS train. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.6.6, "Containment Spray and Cooling Systems," should be entered if an inoperable containment sump results in an inoperable Containment Spray System train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

C.1 and C.2

If the containment sump cannot be restored to OPERABLE status within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 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.

BASES

SURVEILLANCE REQUIREMENTS	<u>SR 3.6.8.1</u> Periodic inspections are performed to verify the containment sump does not show current or potential debris blockage, structural damage, or abnormal corrosion to ensure the operability and structural integrity of the containment sump (Ref. 1). The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
REFERENCES	1. UFSAR, Sections 6.2.1 and 15.6.5. 2. UFSAR, Section A1.82, Regulatory Guide 1.82, Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident.

Attachment 3b

Byron Station, Units 1 and 2
NRC Docket Nos. 50-454 and 50-455

Proposed Technical Specification Bases Changes (Mark-Up) for Information Only

BASES

BACKGROUND (continued)

During the recirculation phase of LOCA recovery, RHR pump suction is transferred to the containment sump. The RHR pumps then supply the other ECCS pumps. Initially, recirculation is through the same paths as the injection phase, i.e., through the cold legs. After approximately 6.0 hours, the ECCS flow is shifted to the hot legs.

The centrifugal charging subsystem of the ECCS also functions to supply borated water to the reactor core following increased heat removal events, such as a Main Steam Line Break (MSLB). The limiting design conditions occur when the negative moderator temperature coefficient is highly negative, such as at the end of each cycle.

During low temperature conditions in the RCS, limitations are placed on the maximum number of ECCS pumps that may be OPERABLE. Refer to the Bases for LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," for the basis of these requirements.

The ECCS subsystems are actuated upon receipt of an SI signal. The actuation of safeguard loads is accomplished in a programmed time sequence. If offsite power is available, the safeguard loads start immediately in the programmed sequence. If offsite power is not available, the Engineered Safety Feature (ESF) buses shed normal operating loads and are connected to the emergency Diesel Generators (DGs). Safeguard loads are then actuated in the programmed time sequence. The time delay associated with diesel starting, sequenced loading, and pump starting determines the time required before pumped flow is available to the core following a LOCA.

The active ECCS components, along with the passive accumulators ~~and the RWST~~ [, the RWST, and the containment sump(s), are] covered in LCO 3.5.1, "Accumulators," and LCO 3.5.4, "Refueling Water Storage Tank (RWST)," [and LCO 3.6.8, "Containment Sump," and] provide the cooling water necessary to meet GDC 35 (Ref. 1).

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The actuation logic is tested as part of ESF Actuation System testing, and equipment performance is monitored as part of the INSERVICE TESTING PROGRAM.

SR 3.5.2.6

This Surveillance demonstrates that each ECCS pump starts on receipt of an actual or simulated SI signal. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The actuation logic is tested as part of ESF Actuation System testing, and equipment performance is monitored as part of the INSERVICE TESTING PROGRAM.

SR 3.5.2.7

Realignment of valves in the flow path on an SI signal is necessary for proper ECCS performance. These valves have mechanical stops to allow proper positioning for restricted flow to a ruptured cold leg, ensuring that the other cold legs receive at least the required minimum flow. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~SR 3.5.2.8~~

~~Periodic inspections of the containment sump suction inlet ensure that it is unrestricted and stays in proper operating condition. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.3 ECCS-Shutdown

BASES

BACKGROUND

The Background section for Bases 3.5.2, "ECCS-Operating," is applicable to these Bases, with the following modifications.

In MODE 4, the required ECCS train consists of two separate subsystems: centrifugal charging (high head) and Residual Heat Removal (RHR) (low head).

and the containment sump

The ECCS flow paths consist of piping, valves, heat exchangers, and pumps such that water from the Refueling Water Storage Tank (RWST) can be injected into the Reactor Coolant System (RCS) following the accidents described in Bases 3.5.2.

APPLICABLE SAFETY ANALYSES

The Applicable Safety Analyses section of Bases 3.5.2 also applies to this Bases section.

Due to the stable conditions associated with operation in MODE 4 and the reduced probability of occurrence of a Design Basis Accident (DBA), the ECCS operational requirements are reduced. It is understood in these reductions that certain automatic Safety Injection (SI) actuation is not available. In this MODE, sufficient time exists for manual actuation of the required ECCS to mitigate the consequences of a DBA.

Only one train of ECCS is required for MODE 4. This requirement dictates that single failures are not considered during this MODE of operation. The ECCS trains satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

B 3.6 CONTAINMENT SYSTEMS

B 3.6.8 ~~(Deleted)~~ Containment Sump

BASES

BACKGROUND

The containment sump provides a borated water source to support recirculation of coolant from the containment sump for residual heat removal, emergency core cooling, and containment cooling during accident conditions.

The containment sumps supply both trains of the Emergency Core Cooling System (ECCS) and the Containment Spray System during any accident that requires recirculation of coolant from the containment sumps. The recirculation mode is initiated when the pump suction is transferred to the containment sump on low Refueling Water Storage Tank (RWST) level, which ensures the containment sump has enough water to supply the net positive suction head to the ECCS and Containment Spray System pumps. The containment sumps include two separate sumps, fully redundant, each servicing one train of the ECCS.

The containment sump contains strainers to limit the quantity of the debris materials from entering the sump suction piping. Debris accumulation on the strainers can lead to undesirable hydraulic effects including air ingestion through vortexing or deaeration, and reduced net positive suction head (NPSH) at pump suction piping.

While the majority of debris accumulates on the strainers, some fraction penetrates the strainers and is transported to downstream components in the ECCS, Containment Spray System, and the Reactor Coolant System (RCS). Debris that penetrates the strainer can result in wear to the downstream components, blockages, or reduced heat transfer across the fuel cladding. Excessive debris in the containment sump water source could result in insufficient recirculation of coolant during the accident, or insufficient heat removal from the core during the accident.

BASES

APPLICABLE SAFETY ANALYSIS	During all accidents that require recirculation, the containment sump provides a source of borated water to the ECCS and Containment Spray System pumps. As such, it supports residual heat removal, emergency core cooling, and containment cooling during an accident. It also provides a source of negative reactivity (Ref. 1). The design basis transients and applicable safety analyses concerning each of these systems are discussed in the Applicable Safety Analyses section of B 3.5.2, "ECCS - Operating," B 3.5.3, "ECCS - Shutdown," and B 3.6.6, "Containment Spray and Cooling Systems." UFSAR Section A1.82 (Ref. 2) references evaluations that confirm long-term core cooling is assured following any accident that requires recirculation from the containment sump. The containment sump satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	Two containment sumps are required to ensure a source of borated water to support ECCS and Containment Spray System OPERABILITY. A containment sump consists of the containment drainage flow paths, a trash rack structure, vertical grating on the perimeter and checkered plate on top, protecting the openings for both sumps. The trash rack prevents debris sliding along the floor from reaching the screens, the containment sump strainers, the pump suction trash racks, and the inlet to the ECCS and Containment Spray System piping. An OPERABLE containment sump has no structural damage or abnormal corrosion that could prevent recirculation of coolant and will not be restricted by containment accident generated and transported debris.

BASES

LCO (continued)

Containment accident generated and transported debris consists of the following:

a. Accident generated debris sources - Insulation, coatings, and other materials which are damaged by the high-energy line break (HELB) and transported to the containment sump. This includes materials within the HELB zone of influence and other materials (e.g., unqualified coatings) that fail due to the post-accident containment environment following the accident;

b. Latent debris sources – Pre-existing dirt, dust, paint chips, fines or shards of insulation, and other materials inside containment that do not have to be damaged by the HELB to be transported to the containment sump; and

c. Chemical product debris sources – Aluminum, zinc, carbon steel, copper, and non-metallic materials such as paints, thermal insulation, and concrete that are susceptible to chemical reactions within the post-accident containment environment leading to corrosion products that are generated within the containment sump pool or are generated within containment and transported to the containment sump.

Containment debris limits are listed in analyses referenced in UFSAR Section A1.82 (Ref. 2).

APPLICABILITY

In MODES 1, 2, 3, and 4, containment sump OPERABILITY requirements are dictated by the ECCS and Containment Spray System OPERABILITY requirements. Since both the ECCS and the Containment Spray System must be OPERABLE in MODES 1, 2, 3, and 4, the containment sump must also be OPERABLE to support their operation.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Thus, the containment sump is not required to be OPERABLE in MODES 5 or 6.

BASES

ACTIONS

A.1, A.2, and A.3

Condition A is applicable when there is a condition which results in containment accident generated and transported debris exceeding the analyzed limits. Containment debris limits are listed in analyses referenced in UFSAR Section A1.82 (Ref. 2).

Immediate action must be initiated to mitigate the condition. Examples of mitigating actions are:

- Removing the debris source from containment or preventing the debris from being transported to the containment sump;
- Evaluating the debris source against the assumptions in the analysis;
- Deferring maintenance that would affect availability of the affected systems and other LOCA mitigating equipment;
- Deferring maintenance that would affect availability of primary defense-in-depth systems, such as containment coolers;
- Briefing operators on LOCA debris management actions; or
- Applying an alternative method to establish new limits.

While in this condition, the RCS water inventory balance, SR 3.4.13.1, must be performed at an increased Frequency of once per 24 hours. An unexpected increase in RCS leakage could be indicative of an increased potential for an RCS pipe break, which could result in debris being generated and transported to the containment sumps. The more frequent monitoring allows operators to act in a timely fashion to minimize the potential for an RCS pipe break while the containment sumps are inoperable.

For the purposes of applying LCO 3.0.6 and the Safety Function Determination Program while in Condition A, two containment sumps are considered a single support system for all ECCS and Containment Spray System trains because containment accident generated and transported debris issues that would render one sump inoperable would render all of the sumps inoperable.

The inoperable containment sump(s) must be restored to OPERABLE status in 90 days. A 90-day Completion Time is reasonable for emergent conditions that involve debris in excess of the analyzed limits that could be generated and transported to the containment sump under accident conditions. The likelihood of an initiating event in the 90-day Completion

BASES

ACTIONS (continued)

Time is very small and there is margin in the associated analyses. The mitigating actions of Required Action A.1 provide additional assurance that the effects of debris in excess of the analyzed limits will be mitigated during the Completion Time.

B.1

When the containment sump(s) is inoperable for reasons other than Condition A, such as blockage, structural damage, or abnormal corrosion that could prevent recirculation of coolant, it must be restored to OPERABLE status within 7 days. The 7 day Completion Time takes into account the reasonable time for repairs, and low probability of an accident that requires the containment sump occurring during this period.

Required Action B.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.5.2, "ECCS - Operating," and LCO 3.5.3, "ECCS - Shutdown," should be entered if an inoperable containment sump results in an inoperable ECCS train. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.6.6, "Containment Spray and Cooling Systems," should be entered if an inoperable containment sump results in an inoperable Containment Spray System train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

C.1 and C.2

If the containment sump cannot be restored to OPERABLE status within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 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.

BASES

SURVEILLANCE REQUIREMENTS	<u>SR 3.6.8.1</u> Periodic inspections are performed to verify the containment sump does not show current or potential debris blockage, structural damage, or abnormal corrosion to ensure the operability and structural integrity of the containment sump (Ref. 1). The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
REFERENCES	1. UFSAR, Sections 6.2.1 and 15.6.5. 2. UFSAR, Section A1.82, Regulatory Guide 1.82, Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident.

Attachment 3c

R.E. Ginna Nuclear Power
Plant NRC Docket No. 50-244

Proposed Technical Specification Bases Changes (Mark-Up) for Information Only

The ECCS subsystems are actuated upon receipt of an SI signal. The actuation of safeguard loads is accomplished in a programmed time sequence. If offsite power is available, the safeguard loads start immediately in the programmed sequence. If offsite power is not available, the Engineered Safety Feature (ESF) buses shed normal operating loads and are connected to the emergency diesel generators (EDGs). Safeguard loads are then actuated in the programmed time sequence. The time delay associated with diesel starting, sequenced loading, and pump starting determines the time required before pumped flow is available to the core following a LOCA.

, the RWST, and the Containment Sump, are

The active ECCS components, along with the passive accumulators ~~and the RWST~~ covered in LCO 3.5.1, "Accumulators," and LCO 3.5.4, "Refueling Water Storage Tank (RWST)," provide the cooling water necessary to meet AIF-GDC 44 (Ref. 8).

and LCO 3.6.7, "Containment Sump," and

APPLICABLE SAFETY ANALYSES

The LCO helps to ensure that the following acceptance criteria for the ECCS, established by 10 CFR 50.46 (Ref. 9), will be met following a LOCA:

a. Maximum fuel element cladding temperature is ≤ 2200°F;

b. Maximum cladding oxidation is ≤ 0.17 times the total cladding thickness before oxidation;

c. Maximum hydrogen generation from a zirconium water reaction is ≤ 0.01 times the hypothetical amount generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react;

d. Core is maintained in a coolable geometry; and

e. Adequate long term core cooling capability is maintained.

The LCO also limits the potential for a post trip return to power following an SLB event and helps ensure that containment temperature limits are met post accident.

SR 3.5.2.6

See SR 3.5.2.5

SR 3.5.2.7

~~Periodic inspections of the containment sump suction inlet to the RHR System ensure that it is unrestricted and stays in proper operating condition. The Surveillance Frequency is controlled under the Surveillance Frequency Program.~~

~~SR 3.5.2.8~~

ECCS piping and components have the potential to develop voids and pockets of entrained gases. Preventing and managing gas intrusion and accumulation is necessary for proper operation of the ECCS and may also prevent water hammer, pump cavitation, and pumping of noncondensible gas into the reactor vessel.

Selection of ECCS locations susceptible to gas accumulation is based on a review of system design information, including piping and instrumentation drawings, isometric drawings, plan and elevation drawings, and calculations. The design review is supplemented by system walk downs to validate the system high points and to confirm the location and orientation of important components that can become sources of gas or could otherwise cause gas to be trapped or difficult to remove during system maintenance or restoration. Susceptible locations depend on plant and system configuration, such as stand-by versus operating conditions.

The ECCS is OPERABLE when it is sufficiently filled with water. Acceptance criteria are established for the volume of accumulated gas at susceptible locations. If accumulated gas is discovered that exceeds the acceptance criteria for the susceptible location (or the volume of accumulated gas at one or more susceptible locations exceeds an acceptance criteria for gas volume at the suction or discharge of a pump), the Surveillance is not met. If it is determined by subsequent evaluation that the ECCS is not rendered inoperable by the accumulated gas (i.e., the system is sufficiently filled with water), the Surveillance may be declared met. Accumulated gas should be eliminated or brought within the acceptance criteria limits.

ECCS locations susceptible to gas accumulation are monitored and, if gas is found, the gas volume is compared to the acceptance criteria for the location. Susceptible locations in the same system flow path which are subject to the same gas intrusion mechanisms may be verified by monitoring a representative sub-set of susceptible locations. Monitoring may not be practical for locations that are inaccessible due to radiological or environmental conditions, the plant configuration, or personnel safety.

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.3 ECCS-MODE 4

BASES

BACKGROUND

The Background section for Bases 3.5.2, "ECCS-MODES 1, 2, and 3," is applicable to these Bases, with the following modifications.

In MODE 4, the required ECCS train consists of two separate subsystems: safety injection (SI) and residual heat removal (RHR).

The ECCS flow paths consist of piping, valves, heat exchangers, and pumps such that water from the refueling water storage tank (RWST) can be injected into the Reactor Coolant System (RCS). The RHR subsystem must also be capable of taking suction from containment Sump B to provide recirculation.

and the containment sump

APPLICABLE SAFETY ANALYSES

There are no Applicable Safety Analyses which apply to the ECCS in MODE 4 due to the stable conditions associated with operation in MODE 4 and the reduced probability of occurrence of a Design Basis Accident (DBA). Therefore, the ECCS operational requirements are reduced in MODE 4. It is understood in these reductions that certain automatic SI actuations are not available. In this MODE, sufficient time is expected for manual actuation of the required ECCS to mitigate the consequences of a DBA. This time is also required since the RHR System may be aligned to provide normal shutdown cooling while the SI System may be isolated from the RCS due to low temperature overpressure protection (LTOP) concerns. Therefore, only one train of ECCS is required for MODE 4. This requirement dictates that single failures are not considered for this LCO due to the time available for operators to respond to an accident.

Even though there are no DBAs in MODE 4, after the initiation of RHR shutdown cooling, there is a temperature range during which, if a shutdown loss-of-coolant-accident (LOCA) occurred, the RHR subsystem may not be fully capable of delivering water from the RWST to the reactor core. That is, when the temperature in the RCS is above the saturation temperature associated with the RWST at the suction to the pump, RHR suction pipe flashing could occur when the RHR suction is transferred from the RCS to the RWST. Consequently, the SI subsystem must have two injection paths available to deliver water to the reactor. This will ensure that, should an unisolable LOCA occur in MODE 4, regardless of break location, the reactor fuel will remain cooled. Calculations show that one SI pump will provide sufficient core cooling through injecting the contents of the RWST via two injection paths.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.7 Containment Sump

BASES

BACKGROUND

The containment sump provides a borated water source to support recirculation of coolant from the containment sump for emergency core cooling during accident conditions.

The containment sump supplies both trains of the Emergency Core Cooling System (ECCS) during any accident that requires recirculation of coolant from the containment sump. The recirculation mode is initiated when the pump suction is transferred to the containment sump on low Refueling Water Storage Tank (RWST) level, which ensures the containment sump has enough water to supply the net positive suction head to the ECCS System pumps. The use of a single containment sump to supply both trains of the ECCS is acceptable since the containment sump is a passive component, and passive failures are not required to be assumed to occur coincident with Design Basis Events.

The containment sump contains strainers to limit the quantity of the debris materials from entering the sump suction piping. Debris accumulation on the strainers can lead to undesirable hydraulic effects including air ingestion through vortexing or deaeration, and reduced net positive suction head (NPSH) at pump suction piping.

While the majority of debris accumulates on the strainers, some fraction penetrates the strainers and is transported to downstream components in the ECCS and the Reactor Coolant System (RCS). Debris that penetrates the strainer can result in wear to the downstream components, blockages, or reduced heat transfer across the fuel cladding. Excessive debris in the containment sump water source could result in insufficient recirculation of coolant during the accident, or insufficient heat removal from the core during the accident.

BASES

APPLICABLE SAFETY ANALYSIS	During all accidents that require recirculation, the containment sump provides a source of borated water to the ECCS pumps. As such, it supports emergency core cooling during an accident. It also provides a source of negative reactivity (Ref. 1). The design basis transients and applicable safety analyses concerning each of these systems are discussed in the Applicable Safety Analyses section of B 3.5.2, "ECCS – MODES 1, 2, and 3," and B 3.5.3, "ECCS – MODE 4." UFSAR Section 6.3 (Ref. 1) references evaluations that confirm long-term core cooling is assured following any accident that requires recirculation from the containment sump. The containment sump satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	The containment sump is required to ensure a source of borated water to support ECCS OPERABILITY. A containment sump consists of the containment drainage flow paths, the containment sump strainers, and the inlet to the ECCS piping. An OPERABLE containment sump has no structural damage or abnormal corrosion that could prevent recirculation of coolant and will not be restricted by containment accident generated and transported debris. Containment accident generated and transported debris consists of the following: a. Accident generated debris sources - Insulation, coatings, and other materials which are damaged by the high-energy line break (HELB) and transported to the containment sump. This includes materials within the HELB zone of influence and other materials (e.g., unqualified coatings) that fail due to the post-accident containment environment following the accident; b. Latent debris sources – Pre-existing dirt, dust, paint chips, fines or shards of insulation, and other materials inside containment that do not have to be damaged by the HELB to be transported to the containment sump; and c. Chemical product debris sources – Aluminum, zinc, carbon steel, copper, and non-metallic materials such as paints, thermal insulation, and concrete that are susceptible to chemical reactions within the post-accident containment environment leading to corrosion products that are generated within the containment sump pool or are generated within containment and transported to the containment sump. Containment debris limits are in analysis referenced in UFSAR Section 6.3 (Ref. 1).

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, containment sump OPERABILITY requirements are dictated by the ECCS OPERABILITY requirements. Since the ECCS must be OPERABLE in MODES 1, 2, 3, and 4, the containment sump must also be OPERABLE to support their operation.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Thus, the containment sump is not required to be OPERABLE in MODES 5 or 6.

ACTIONS

A.1, A.2, and A.3

Condition A is applicable when there is a condition which results in containment accident generated and transported debris exceeding the analyzed limits. Containment debris limits are in analysis referenced in UFSAR Section 6.3 (Ref. 1).

Immediate action must be initiated to mitigate the condition. Examples of mitigating actions are:

- Removing the debris source from containment or preventing the debris from being transported to the containment sump;
- Evaluating the debris source against the assumptions in the analysis;
- Deferring maintenance that would affect availability of the affected systems and other LOCA mitigating equipment;
- Deferring maintenance that would affect availability of primary defense-in-depth systems, such as containment coolers;
- Briefing operators on LOCA debris management actions; or
- Applying an alternative method to establish new limits.

While in this condition, the RCS water inventory balance, SR 3.4.13.1, must be performed at an increased Frequency of once per 24 hours. An unexpected increase in RCS leakage could be indicative of an increased potential for an RCS pipe break, which could result in debris being generated and transported to the containment sump. The more frequent monitoring allows operators to act in a timely fashion to minimize the potential for an RCS pipe break while the containment sump is inoperable.

BASES

ACTIONS (continued)

The inoperable containment sump must be restored to OPERABLE status in 90 days. A 90-day Completion Time is reasonable for emergent conditions that involve debris in excess of the analyzed limits that could be generated and transported to the containment sump under accident conditions. The likelihood of an initiating event in the 90-day Completion Time is very small and there is margin in the associated analyses. The mitigating actions of Required Action A.1 provide additional assurance that the effects of debris in excess of the analyzed limits will be mitigated during the Completion Time.

B.1

When the containment sump is inoperable for reasons other than Condition A, such as blockage, structural damage, or abnormal corrosion that could prevent recirculation of coolant, it must be restored to OPERABLE status within 72 hours. The 72 hour Completion Time takes into account the reasonable time for repairs, and low probability of an accident that requires the containment sump occurring during this period.

Required Action B.1 is modified by one Note. This Note indicates that the applicable Conditions and Required Actions of LCO 3.5.2, "ECCS – MODES 1, 2, and 3," and LCO 3.5.3, "ECCS – MODE 4," should be entered if an inoperable containment sump results in an inoperable ECCS train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

C.1 and C.2

If the containment sump cannot be restored to OPERABLE status within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 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.

BASES

SURVEILLANCE REQUIREMENTS	SR 3.6.7.1 Periodic inspections are performed to verify the containment sump does not show current or potential debris blockage, structural damage, or abnormal corrosion to ensure the operability and structural integrity of the containment sump (Ref. 1). The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
REFERENCES	1. UFSAR, Section 6.3 and 15.6.