ENCLOSURE 1 TO
NRC-17-0057

10 CFR 50.59 Evaluation Summary Report

50.59 EVALUATION SUMMARY

50.59 Evaluation No:	15-0228 Rev. 0	**UFSAR Revision No.**	21
Reference Document:	EDP 37429 LCR 15-064-UFS	**Section(s)**	
		Table(s)	
		Figure Change	☒ Yes ☐ No

Title of Change: **Modifying Reactor Recirculation Motor Generator Single Point Vulnerability Load Shedding Logic**

The trip logic for the Reactor Recirculation Motor Generator (RRMG) sets is modified from the original one-out-of-one taken once configuration to a two-out-of-three taken once configuration. This modification is implemented to eliminate a single point vulnerability identified during the root cause investigation of the 2008 manual reactor scram following a trip of both reactor recirculation motor pumps. The alteration of the trip logic constitutes a fundamental change in how the reactor recirculation system achieves its design function of mitigating the effects of an Anticipated Transient Without Scram event.

While the Reactor Recirculation System is not an Engineered Safety System, nor is it required for plant safe shutdown, the fundamental change in how this system responds to an undervoltage and/or a phase sequence event conservatively requires further evaluation. The review of the modified trip configuration, utilizing a two-out-of-three taken once logic, does not identify any new potential failures. Therefore, the proposed activity does not result in a more than minimal increase in an accident frequency or the likelihood of a malfunction. Since the tripping of the reactor recirculation motor generators does not result in the release of radioactive material from the fuel, there is no increase with regards to the consequences of an accident or malfunction previously evaluated. The Failure Modes and Effects Analysis completed for this activity identified failure effects similar to those with the existing trip logic components, therefore, this modification does not create the possibility for an accident different than any previously described in the UFSAR or a malfunction of a structure, system, or component important to safety with a different result than any previously evaluated in the UFSAR. Furthermore, the replacement trip logic components do not constitute part of any fission product barriers so that no design basis limit for an UFSAR described fission product barrier is exceeded or altered. Finally, there are no changes to existing methods of evaluation as defined in the UFSAR, therefore, no UFSAR described evaluation methodologies nor elements of evaluation methodologies are revised or replaced. The conclusion of this evaluation is that a license amendment is not required for this change.

50.59 EVALUATION SUMMARY

50.59 Evaluation No:	16-0169 Rev. 0	**UFSAR Revision No.**	N/A
Reference Document:	TM 16-0017	**Section(s)**	
		Table(s)	
		Figure Change	☐ Yes ☒ No

Title of Change: **Temporary Modification 16-0017, Installation of a Mechanical Locking Clamp on the Positioner Arm of the Reactor Recirculation Motor-Generator Set A Scoop Tube to Allow Actuator Repairs/ Maintenance with Continued Operation of the Reactor Recirculation Motor-Generator Set A in a Scoop Tube Locked Condition**

A Temporary Modification (TM) has been proposed to install a mechanical locking clamp on the positioner arm of the Reactor Recirculation Motor-Generator (RRMG) Set A scoop tube to allow actuator repairs and maintenance with continued operation of the RRMG Set A in a scoop tube locked position. The TM clamping device will retain the actuating stem in the current position. The clamp is necessary since the linkage will have to be disconnected at some stage of the maintenance work and the electronic switch lockout will not provide the necessary locking to ensure the actuator rod is retained in the same position to prevent Reactor Recirculation Pump (RRP) speed changes and subsequent flow and reactivity changes. In addition, the scoop tube brake switch was placed in lockout prior to the installation of the TM and the maintenance work. It is recognized that the ability exists to remove the switch from lockout. However, the switch being in lockout is included in this evaluation since the available response time to take operator action is insufficient to ensure that the runback is reinstated in time to allow the runback design feature to function if called upon. This action was considered adverse because of the disabling of the design function and the performance of a 50.59 evaluation was required.

The use of the brake switch to lock the scoop tube along with the proposed installation of a mechanical locking clamp on the RRMG scoop tube positioner arm to preclude movement while disconnected from its actuator does not require prior NRC approval. The RRP runback is an engineering design feature that supports plant operations and provides a non-safety related power reduction feature that is intended to aid in reducing power under certain plant events to help maintain power operations. This non-safety related engineered design feature is not credited to ensure continued plant operations (trip prevention) following an event that initiates the runback. The inability for a runback to occur does not alter/impact existing accident or transient analyses as this aspect is not credited for mitigation purposes. In addition, the passive configuration established by the installation of the clamp is not conducive to a different type of event or unanalyzed condition. A failure of the clamp is bounded by the recirculation flow control system failure previously analyzed. Maintaining reactor coolant flow by the affected RRMG set in this fashion remains within the functional boundaries of the system consistent with its designation as a non-essential system. Also, locking the scoop tube by use of the lockout switch or by the temporary use of the clamp does not impact the ability of the Reactor Recirculation System to provide coolant flow and does not impact the ability to maintain reactor coolant pressure boundary integrity. Finally, utilization of the mechanical locking clamp does not involve the use of an evaluation methodology that constitutes a departure from those previously used in establishing the design basis or for existing safety analyses.

[Note that the temporary modification described in this evaluation has since been removed and cancelled due to subsequent repair of the relevant equipment.]

50.59 EVALUATION SUMMARY

50.59 Evaluation No:	16-0251 Rev. 0	**UFSAR Revision No.**	21
Reference Document:	DC-4804 Vol. I LCR 16-082-UFS	**Section(s)**	6.2.3.3.2 6.2 References
		Table(s)	
		Figure Change	☒ Yes ☐ No

Title of Change: **Revision A of DC-4804 Vol. I, "Secondary Containment Drawdown During DBA-LOCA," and Related Licensing Change Request (LCR) 16-082-UFS Rev. 0 Affecting UFSAR Section 6.2.3.3.2 and Figure 6.2-21**

Design Calculation (DC) 4804 Volume I Revision A, "Secondary Containment Drawdown During DBA-LOCA," includes a computer code upgrade from "HVAC" to "GOTHIC." The changes made in DC-4804 Vol. I Rev. A are also reflected in LCR 16-082-UFS, affecting UFSAR Section 6.2.3.3.2 and improving secondary containment drawdown performance as shown in UFSAR Figure 6.2-21.

DC-4804 Vol. I Rev. A includes input changes, a computer code upgrade from HVAC to GOTHIC, and it predicts a secondary containment drawdown performance improvement. The upgrade to GOTHIC was made due to limitations imposed by the HVAC code and obsolescence, whereas the drawdown performance improvement is attributed to plant-specific input and assumption changes. However, the HVAC code is called out by name in UFSAR Section 6.2.3.3.2. Therefore, use of GOTHIC is treated as a change in an element of a UFSAR described evaluation methodology. The use of GOTHIC is accepted based on prior acceptance by the NRC for secondary containment drawdown (Columbia Generating Station SER for License Amendment 199 [ML062610440]). Other UFSAR assumptions that are treated as elements of the method are either retained in DC-4804 Vol. I Rev. A, or changed in a conservative direction. On this basis, the evaluation concludes that there is no departure from a method of evaluation described in the UFSAR used in establishing the design bases or in the safety analyses.

50.59 EVALUATION SUMMARY

50.59 Evaluation No:	17-0071 Rev. 0	**UFSAR Revision No.**	N/A
Reference Document:	TM 17-0010 TE-E11-17-018	**Section(s)**	
		Table(s)	
		Figure Change	☐ Yes ☒ No

Title of Change: **Elimination of Line Flushing and Warmup, through Residual Heat Removal Division 2 Inboard Isolation Testable Check Valve, Prior to its Use for Shutdown Cooling Mode**

Due to the inability to achieve the required test pressure on Residual Heat Removal (RHR) Division 2 inboard isolation valve E1100F050B, the valve actuator is disabled by Temporary Modification (TM) 17-0010 to allow use of this division to provide shutdown cooling (SDC). However, without the actuator, backflow through the check valve can not be established for flushing and warmup purposes prior to use of RHR Division 2 for SDC operations. This 10 CFR 50.59 evaluation assesses the effect of using RHR Division 2 for SDC without prior flushing and warmup of the line.

The proposed elimination of flushing and warmup of the Division 2 Residual Heat Removal line before its use for shutdown cooling will not reduce the margin of safety as defined in the Technical Specifications, Safety Evaluation Report (SER) or UFSAR. Evaluation of the effect of the proposed change indicates that all design standards and applicable safety criteria are met. The established finding of no significant consequences from the omission of flushing, reported to the NRC in responding to Item 212.170 documented in the FSAR, and the current determination of minimal impact to fuel cladding integrity in a technical evaluation along with the recent General Electric (GE) Hitachi report on RHR Tee fatigue usage due to shutdown transients supports the conclusion that there are no adverse effects to previously evaluated accidents or malfunctions, no potential for the creation of a new type of event, no more than minimal impacts to fission product barriers, and no impact to evaluation methodologies as described in the UFSAR. Therefore, prior NRC approval of this change is not required.

[Note that the temporary modification described in this evaluation is currently still in place.]

50.59 EVALUATION SUMMARY

50.59 Evaluation No:	17-0100 Rev. 0	**UFSAR Revision No.**	21
Reference Document:	TSR-37739 Rev. 0 LCR 17-037-UFS	**Section(s)**	3.13.3.13
		Table(s)	
		Figure Change	☐ Yes ☒ No

Title of Change: **Technical Service Request 37739 – Use of Computer Program STAAD.Pro in Place of STAAD-III for Performing Structural Analysis of Framed Structures and Obtaining Internal Structure Forces, Moments, Stresses, and Nodal Displacements & Rotations**

Technical Service Request (TSR) 37739 documents revisions to various calculations which include the use of computer program STAAD.Pro, Version V8i, to determine moments, shear, and torsion values, and also for finite element modeling, instead of STAAD-III. STAAD-III is a general purpose structural analysis program referenced in UFSAR Section 3.13.3.13 as a computer program used for structural analysis and design of Fermi 2. As established in NEI 96-07, Rev. 1, Section 4.2.1.3, the proposed use of an alternate method of evaluation is considered an adverse change that must be evaluated under 10 CFR 50.59(c)(2)(viii). The NEI guidance provides the example of an identified computer code used for performing analyses relevant to the design of a plant, which if are outside the identified constraints and limitations of an associated topical report or Safety Evaluation Report (SER) would screen in. This has been reinforced by the NRC's position established in their Regulatory Issue Summary (RIS) 2016-03 regarding what constitutes an adequate evaluation of whether a computer code change (in this case using STAAD.Pro in place of STAAD-III) is a departure from an established method of evaluation.

This evaluation determines that use of computer code STAAD.Pro (Version V8i) in place of STAAD-III does not require prior NRC approval. This conclusion is based on the establishment that STAAD.Pro is an approved NRC method for performing finite element modeling and analysis per an existing Safety Evaluation Report for such an application (Oconee Nuclear Station SER [ML14206A790]). Therefore, use of STAAD.Pro is not considered a departure from a method of evaluation described in the UFSAR used in establishing the design bases or in the safety analyses.

50.59 EVALUATION SUMMARY

50.59 Evaluation No:	17-0108 Rev. 0	**UFSAR Revision No.**	N/A
Reference Document:	TSR-37851 Rev. 0	**Section(s)**	
		Table(s)	
		Figure Change	☐ Yes ☒ No

Title of Change: **Technical Service Request 37851 Rev. 0 – Revise Specification 3071-128-EQ-1-4 for Installation of Pomona Terminal Jacks on HFA Relays to Facilitate Main Steamline Isolation Valve (MSIV) Channel Functional Testing Using the MSIV Test Box According to Technical Specification Surveillance Requirements**

Technical Service Request (TSR) 37851 adds Pomona Terminal Jacks (PTJ) to specification 3071-128-EQ-1-4 for installation on HFA relays as convenient test lead connection points to support the Main Steamline Isolation Valve (MSIV) Test Box (MTB) application. The MTB has been requested to be used for performance of the MSIV trip channel functional testing by testing in the bypass condition as opposed to the tripped condition. This 50.59 Evaluation addresses conformance with regulatory guidance and plant licensing and design bases for the use of the MTB to bypass the MSIV and the Main Steamline (MSL) Drain Valves isolation functions during the performance of the MSIV functional testing. Also included is a discussion of various aspects of the MTB installation, including hardware functionality and administrative controls in place during the online testing.

This evaluation reviewed use of the MTB and PTJs during functional surveillance testing of MSIV isolation logic and concluded that the use of the MTB does not adversely affect the method of evaluation in the UFSAR and that the design function of MSIV isolation logic will be maintained. It is acceptable to inhibit a half MSIV isolation signal during functional testing of the MSIV isolation trip channels because of the diversity of sensors and the redundancy of the MSIV isolation logic design. UFSAR accidents were reviewed to assure that operation with a temporary inhibited MSIV isolation signal is bounded by the original safety analyses and does not result in new accidents or different consequences. Based on the responses to 50.59 Evaluation criteria, it was determined that the plant operation while using the MTB during the MSIV isolation functional testing can proceed without prior NRC approval.

50.59 EVALUATION SUMMARY

50.59 Evaluation No:	17-0166 Rev. 0	**UFSAR Revision No.**	21
Reference Document:	LCR 17-046-UFS	**Section(s)**	3.7.3.6.4, 3.9.1.6.1, 3.9.2.2.1, 3.13.3
		Table(s)	
		Figure Change	☐ Yes ☒ No

Title of Change: **UFSAR Revision to Incorporate AutoPIPE and GTSTRUDL**

The UFSAR is being revised (LCR 17-046-UFS) to incorporate AutoPIPE and GT STRUDL into Chapter 3. Adding descriptions of the software capabilities and verification documents acceptability for use in design basis and safety related analysis.

This evaluation determines that use of computer codes AutoPIPE V1 1.1 and GT STRUDL Version 33 in place of PIPSYS and STRUDL II, respectively, does not require prior NRC approval. This conclusion is based on the establishment that AutoPIPE and GT STRUDL are approved NRC methods for performing pipe stress and structural analysis, respectively, per existing Safety Evaluation Reports for such an application (Three Mile Island Nuclear Station SER for AutoPIPE [ML15225A158] and Vogtle Electric Generating Plant SER for GT STRUDL [ML12271A045]). Therefore, use of AutoPIPE Vi 1.1 and GT STRUDL Version 33 is not considered a departure from a method of evaluation described in the UFSAR used in establishing the design bases or in the safety analyses.

ENCLOSURE 2 TO
NRC-17-0057

Commitment Management Report

Commitment Management Report

Fermi 2 administrative programs and procedures are consistent with the Nuclear Energy Institute's (NEI) "Guidelines for Managing NRC Commitment Changes," NEI 99-04, Revision 0, dated July 1999. These guidelines discuss the need for a report to be submitted either annually or along with the UFSAR updates required by 10 CFR 50.71(e).

This report involves changes that have been made in the Fermi 2 commitment management database (referred to as the Regulatory Action Commitment and Tracking System or RACTS).

Commitment changes are included in the following two tables:

- Table 1: Commitments that have been deleted from the Fermi 2 RACTS database because they are no longer applicable.
- Table 2: Commitments that have been revised in the RACTS database. The table includes the original commitment and reference document in addition to a brief description of the change.

Table 1

Regulatory Commitments Deleted From the Regulatory Commitment Tracking System (RACTS)

RACTS NO.	ORIG. DATE	REFERENCE DOCUMENT	DESCRIPTION OF COMMITMENT	BASIS FOR DELETION
04465	03/14/1985	NRC Inspection Report 85-003 DTE letter NRC-87-0033	Revise surveillance procedures to remove Inservice Testing Program requirements that conflicted with Technical Specifications. Correct deficiencies in surveillance procedure implementation where independent verifier was the same person and pen and ink changes were not correctly implemented.	The commitment was changed to one-time closed. The procedure changes were one-time corrective actions that were previously completed. The implementation deficiencies were corrected by repeating the surveillances. The commitment is fulfilled.
07726	08/13/1986	NRC Inspection Report 86-019	Revise instrument valve line-ups in system operating procedures to place the instruments in walkdown order to aid personnel in locating the instruments.	The commitment was changed to one-time closed. This was a one-time corrective action to add detail to plant procedures. The commitment is fulfilled.
20215	02/24/2006	DTE letter NRC-06-0014	Revise fire protection procedure as described in DTE letter NRC-06-0014. The details of the letter are safeguards information.	The commitment was changed to one-time closed. The procedure changes were previously completed. The commitment is fulfilled.
20376	12/02/2015	DTE letter NRC-15-0101	DTE will consider the site Severe Accident Management Guidelines (SAMGs) within plant configuration management processes in order to ensure that the SAMGs reflect changes to the facility over time.	The commitment was changed to one-time closed. As a result of adoption of the industry-wide standard design process, consideration of SAMGs is included within the design attribute review. The commitment is fulfilled.

Table 1

Regulatory Commitments Deleted From the Regulatory Commitment Tracking System (RACTS)

RACTS NO.	ORIG. DATE	REFERENCE DOCUMENT	DESCRIPTION OF COMMITMENT	BASIS FOR DELETION
88271	05/17/1988	NRC Information Notice 85-35, Supplement 1	Test main steam isolation valve (MSIV) accumulator check valves and safety relief valves (SRV).	The commitment was changed to one-time closed. The MSIV and SRV surveillance tests were performed during the first refueling outage and continue to be performed in accordance with the Inservice Testing Program. The commitment is fulfilled.
88331	07/11/1988	DTE letter NRC-88-0155	Revise procedure to include complete response time testing of low pressure coolant injection (LPCI) actuation instrumentation.	The commitment was changed to one-time closed. The procedure changes were one-time corrective actions that were previously completed. The commitment is fulfilled.
88476	08/19/1988	NRC Information Notice 88-64	Review Information Notice 88-64 regarding the reporting of fires in nuclear process systems and take appropriate actions to ensure proper reporting to the NRC. Reporting of fires is required by 10 CFR 50.72 and 50.73 regulations.	The commitment was changed to one-time closed. A review of reporting procedures was previously completed with no changes required. The commitment is fulfilled. Continued compliance with regulations in 10 CFR 50 does not need to be tracked separately as a commitment.
88691	11/14/1988	DTE letter NRC-88-0255	Revise procedures and drawings in accordance with the locked valve program design calculation and install locking/sealing mechanisms for any additional identified valves.	The commitment was changed to one-time closed. This was a one-time corrective action associated with implementation of the locked valve guidelines. The commitment is fulfilled.

Table 1

Regulatory Commitments Deleted From the Regulatory Commitment Tracking System (RACTS)

RACTS NO.	ORIG. DATE	REFERENCE DOCUMENT	DESCRIPTION OF COMMITMENT	BASIS FOR DELETION
89155	03/10/1989	DTE letter NRC-89-0055	Perform an additional secondary containment integrity test without the railroad door airlock inflatable seal.	The commitment was changed to one-time closed. The testing with the inflatable seal deflated was a one-time test that has been performed. The commitment is fulfilled.
89261	04/03/1989	NRC Generic Letter 89-04 DTE letter NRC-90-0178	Revise the Inservice Testing Program based on Generic Letter 89-04.	The commitment was changed to one-time closed. The procedure changes were previously completed. The commitment is fulfilled.
89330	06/12/1989	NRC Inspection Report 89-013	Revise procedures to include direction to procedure authors on addressing implementation issues such as training on changes and changes to training material.	The commitment was changed to one-time closed. The procedure changes were previously completed. The commitment is fulfilled. In addition, the need for training on revised procedures is now reviewed by training personnel rather than procedure authors.

Table 1

Regulatory Commitments Deleted From the Regulatory Commitment Tracking System (RACTS)

RACTS NO.	ORIG. DATE	REFERENCE DOCUMENT	DESCRIPTION OF COMMITMENT	BASIS FOR DELETION
90158	03/09/1990	DTE letter NRC-90-0043	Enhance radiation worker training to annually provide instruction on contents of radiation work permits, including protective clothing requirements.	The commitment was changed to one-time closed. The procedure changes were one-time corrective actions that were previously completed. In addition, radiation worker training is now based on industry-wide standards in the NANTEL training system. Specific frequencies of training are controlled by the training program using a systematic approach. The commitment is fulfilled.
91221	08/12/1991	DTE letter NRC-91-0094	Review procedures and revise those which use the term "acceptable limits" rather than defining actual acceptance criteria.	The commitment was changed to one-time closed. The procedure changes were one-time corrective actions that were previously completed. The commitment is fulfilled.
92061	02/18/1992	NRC Information Notice 92-13	Revise existing procedures and other applicable Fermi 2 documents to incorporate the requirements of the vehicle control action plan to ensure adequate control over vehicular traffic.	The commitment was changed to one-time closed. The procedure changes were previously completed. The commitment is fulfilled.
94289	08/15/1994	DTE letter NRC-94-0064	Revise procedures to fully test 480 V load shed logic and any other deficiencies identified during the review process.	The commitment was changed to one-time closed. The procedure changes were one-time corrective actions that were previously completed. The commitment is fulfilled.

Table 2

Regulatory Commitments Revised in the Regulatory Commitment Tracking System (RACTS)

RACTS NO.	ORIG. DATE	REFERENCE DOCUMENT	DESCRIPTION OF COMMITMENT	BASIS FOR COMMITMENT CHANGE
90090	01/26/1990	NRC Generic Letter 89-13 and Supplement 1 DTE letter NRC-90-0012	Implement a test and monitoring program to verify the heat transfer capabilities of safety-related heat exchangers and other heat exchanging components of service water systems. Establish periodic retesting and inspection schedules through the existing surveillance program, preventive maintenance program and performance testing program.	The service water systems identified in DTE letter NRC-90-0012 included the Emergency Equipment Cooling Water (EECW) system in addition to three other service water systems. The basis for inclusion of EECW was not clearly documented. DTE has made equipment changes to actively remove corrosion products and other particulate to maintain a clean EECW system and has made chemical treatment changes over the years to adequately control corrosion rates and suspended solids. EECW now meets the conditions which allow exclusion of EECW from the Generic Letter 89-13 "open-cycle" definition. There is no expected condition now or in the future from water based corrosion, erosion, or fouling that would impact the ability of the EECW system and its components from performing their safety function. The commitment continues to be met.

Table 2

Regulatory Commitments Revised in the Regulatory Commitment Tracking System (RACTS)

RACTS NO.	ORIG. DATE	REFERENCE DOCUMENT	DESCRIPTION OF COMMITMENT	BASIS FOR COMMITMENT CHANGE
90091	01/26/1990	NRC Generic Letter 89-13 and Supplement 1 DTE letter NRC-90-0012	Implement inspection and maintenance programs for service water systems piping and components to ensure that corrosion, protective coating failure, silting and biofouling problems do not degrade the performance of the safety related systems supplied by service water. Include removal of excessive accumulations and repair of degraded systems and components in these programs.	Same as provided above for RACTS No. 90090.

ENCLOSURE 3 TO
NRC-17-0057

Summary of Revisions to Technical Requirements Manual, Volume I, and Revised Pages

**Summary of the Technical Requirements Manual (TRM)
Volume I Changes**

Revision 111 05/03/2017	Revised Core Operating Limits Report (COLR) for Cycle 19, Revision 0*.

* Pages of the COLR from Revision 111 of the TRM are not attached. The COLR is included in Volume I of the TRM for convenience and ease of reference; however, it is not part of the information incorporated by reference into the UFSAR.

ENCLOSURE 4 TO
NRC-17-0057

Summary of Revisions to Technical Specifications Bases
and Revised Pages

Summary of Technical Specification Bases (TSB) Changes

Revision 65 06/01/2016	Revised Sections B 3.5.1 to implement License Amendment 203 to Revise Technical Specification Section 3.5.1, Emergency Core Cooling System – Operating.
Revision 66 07/18/2016	Revised Sections B 3.4.8, 3.4.9, 3.5.1, 3.5.2, 3.5.3, 3.6.2.3, 3.6.2.4, 3.9.7, and 3.9.8 to implement License Amendment 204 to Revise Technical Specifications to Adopt Technical Specifications Task Force (TSTF) – 523, "Generic Letter 2008-01, Managing Gas Accumulation," Revision 2.
Revision 67 08/16/2016	Revised Sections B 3.7.1 and 3.7.2 to clarify operability requirements based on TSTF-550-T, "Correct Misleading Bases Statements in Systems Not Required to be Operable in Shutdown Modes," Revision 1.
Revision 68 11/29/2016	Revised Section B 3.8.4 to correct typographical errors identified through the Corrective Action Program.
Revision 69 12/15/2016	Revised Section B 3.5.1 to replace detailed information regarding analysis assumptions with a reference to the UFSAR to eliminate an inconsistency identified through the Corrective Action Program.
Revision 70 04/13/2017	Revised Sections B 3.3.5.1 and 3.3.5.2 to implement License Amendment 206 to Revise High Pressure Coolant Injection System and Reactor Core Isolation Cooling System Actuation Instrumentation Technical Specifications.
Revision 71 05/23/2017	Revised Section B 3.3.8.1 to clarify information regarding time delays for the loss of power instrumentation. Revised Section 3.7.5 to clarify the thermal power used to determine the main condenser offgas activity. Both changes were editorial changes to improve reader understanding that were identified through the Corrective Action Program.

The following pages are information only copies of the revised TSB pages for the above revisions.

BASES

APPLICABLE SAFETY ANALYSES (continued)

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 that would be generated if all of the metal in the cladding surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react;

d. The core is maintained in a coolable geometry; and

e. Adequate long term cooling capability is maintained.

The limiting single failures are discussed in Reference 11. The Design Basis Accident recirculation suction line break with the failure of the Division II battery results in the highest nominal peak cladding temperature. One ADS valve failure is analyzed as a limiting single failure for events requiring ADS operation. The remaining OPERABLE ECCS subsystems provide the capability to adequately cool the core and prevent excessive fuel damage.

The ECCS satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Each ECCS injection/spray subsystem and five ADS valves are required to be OPERABLE. The ECCS injection/spray subsystems are defined as the two CS subsystems, the two LPCI subsystems, and one HPCI System. The low pressure ECCS injection/spray subsystems are defined as the two CS subsystems and the two LPCI subsystems.

With less than the required number of ECCS subsystems OPERABLE, the potential exists that during a limiting design basis LOCA concurrent with the worst case single failure, the limits specified in Reference 10 could be exceeded. All ECCS subsystems must therefore be OPERABLE to satisfy the single failure criterion required by Reference 10.

A LPCI subsystem is considered inoperable during alignment and operation for decay heat removal when below the actual RHR cut in permissive pressure in MODE 3, since transferring from the shutdown cooling mode to the LPCI mode, could result in voiding in the suction piping, pump cavitation, water hammer, and associated RHR System damage. At these low pressures and decay heat levels, a reduced complement of ECCS subsystems should provide the required core cooling, thereby allowing operation of RHR shutdown cooling when

BASES

LCO (continued)

necessary. The LPCI System cross-tie valves must be open to support OPERABILITY of both LPCI subsystems. Similarly, the LPCI swing bus (480 V MCC 72CF) is required to be energized to support both LPCI subsystems. Therefore, with the LPCI cross-tie valve not full open, or the LPCI swing bus not energized, both LPCI subsystems are declared inoperable.

APPLICABILITY

All ECCS subsystems are required to be OPERABLE during MODES 1, 2, and 3, when there is considerable energy in the reactor core and core cooling would be required to prevent fuel damage in the event of a break in the primary system piping. In MODES 2 and 3, when reactor steam dome pressure is ≤ 150 psig, ADS and HPCI are not required to be OPERABLE because the low pressure ECCS subsystems can provide sufficient flow below this pressure. ECCS requirements for MODES 4 and 5 are specified in LCO 3.5.2, "ECCS-Shutdown."

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable HPCI system. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable HPCI system and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

If any one low pressure ECCS injection/spray subsystem is inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE subsystems provide adequate core cooling during a LOCA. However, overall ECCS reliability is reduced, because a single failure in one of the remaining OPERABLE subsystems, concurrent with a LOCA, may result in the ECCS not being able to perform its intended safety function. The 7 day Completion Time is based on a reliability study (Ref. 12) that evaluated the impact on ECCS availability, assuming various components and subsystems were taken out of service. The results were used to calculate the average availability of ECCS equipment needed to mitigate the consequences of a LOCA as a function of allowed outage times (i.e., Completion Times).

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. For the HPCI System, this SR also includes the steam flow path for the turbine and the flow controller position.

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

SR 3.5.1.5

Verification that ADS primary containment pneumatic supply pressure is ≥ 75 psig ensures adequate air or nitrogen pressure for reliable ADS operation. The accumulator on each ADS valve provides pneumatic pressure for valve actuation. The design pneumatic supply pressure requirements for the accumulator are such that, following a failure of the pneumatic supply to the accumulator, at least five valve actuations can occur with the drywell at the long term drywell pressure of the design basis small break LOCA analysis (Ref. 15). The ECCS safety analysis assumes only one actuation to achieve the depressurization required for operation of the low pressure ECCS. This minimum required pressure of ≥ 75 psig is provided by the primary pneumatic supply system. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

LCO (continued)

common discharge piping. Thus, to meet the LCO, both pumps in one loop or one pump in each of the two loops must be OPERABLE. Since the piping and heat exchangers are passive components that are assumed not to fail, they are allowed to be common to both subsystems. Each shutdown cooling subsystem is considered OPERABLE if it can be manually aligned (remote or local) in the shutdown cooling mode for removal of decay heat. In MODE 3, one RHR shutdown cooling subsystem can provide the required cooling, but two subsystems are required to be OPERABLE to provide redundancy. Operation of one subsystem can maintain or reduce the reactor coolant temperature as required. However, to ensure adequate core flow to allow for accurate average reactor coolant temperature monitoring, nearly continuous operation is required. Management of gas voids is important to RHR Shutdown Cooling System OPERABILITY.

Note 1 permits both RHR shutdown cooling subsystems to be shut down for a period of 2 hours in an 8 hour period. Note 2 allows one RHR shutdown cooling subsystem to be inoperable for up to 2 hours for the performance of Surveillance tests. These tests may be on the affected RHR System or on some other plant system or component that necessitates placing the RHR System in an inoperable status during the performance. This is permitted because the core heat generation can be low enough and the heatup rate slow enough to allow some changes to the RHR subsystems or other operations requiring RHR flow interruption and loss of redundancy.

APPLICABILITY

In MODE 3 with reactor steam dome pressure below the RHR cut in permissive pressure (i.e., the actual pressure at which the interlock resets) the RHR System may be operated in the shutdown cooling mode to remove decay heat to reduce or maintain coolant temperature. Otherwise, a recirculation pump is required to be in operation.

In MODES 1 and 2, and in MODE 3 with reactor steam dome pressure greater than or equal to the RHR cut in permissive pressure, this LCO is not applicable. Operation of the RHR System in the shutdown cooling mode is not allowed above this pressure because the RCS pressure may exceed the design pressure of the shutdown cooling piping. Decay heat removal at reactor pressures greater than or equal to the RHR cut in permissive pressure is typically accomplished by condensing

BASES

SURVEILLANCE REQUIREMENTS (continued)

Surveillance being met (i.e., forced coolant circulation is not required for this initial 4 hour period), which also allows entry into the Applicability of this Specification in accordance with SR 3.0.4 since the Surveillance will not be "not met" at the time of entry into the Applicability.

SR 3.4.8.2

RHR Shutdown Cooling System 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 RHR shutdown cooling subsystems and may also prevent water hammer, pump cavitation, and pumping of noncondensible gas into the reactor vessel.

Selection of RHR Shutdown Cooling System 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 RHR Shutdown Cooling System 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 RHR Shutdown Cooling System 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.

RHR Shutdown Cooling System locations susceptible to gas accumulation are monitored and, if gas is found, the gas volume is compared to the acceptance criteria for the

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 subset 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. For these locations alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and determined to not challenge system OPERABILTIY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILTIY during the Surveillance interval.

This SR is modified by a Note that states the SR is not required to be performed until 12 hours after reactor steam dome pressure is less than the RHR cut in permissive pressure. In a rapid shutdown, there may be insufficient time to verify all susceptible locations prior to entering the Applicability.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Surveillance Frequency may vary by location susceptible to gas accumulation.

REFERENCES None.

BASES

LCO (continued)

in one loop or one pump in each of the two loops must be OPERABLE. Since the piping and heat exchangers are passive components that are assumed not to fail, they are allowed to be common to both subsystems. In MODE 4, the RHR cross tie valve (E1150-F010) may be opened to allow pumps in one loop to discharge through the opposite recirculation loop to make a complete subsystem. Additionally, each shutdown cooling subsystem is considered OPERABLE if it can be manually aligned (remote or local) in the shutdown cooling mode for removal of decay heat. In MODE 4, one RHR shutdown cooling subsystem can provide the required cooling, but two subsystems are required to be OPERABLE to provide redundancy. Operation of one subsystem can maintain or reduce the reactor coolant temperature as required. However, to ensure adequate core flow to allow for accurate average reactor coolant temperature monitoring, nearly continuous operation is required. Management of gas voids is important to RHR Shutdown Cooling System OPERABILITY.

Note 1 permits both RHR shutdown cooling subsystems to be shut down for a period of 2 hours in an 8 hour period. Note 2 allows one RHR shutdown cooling subsystem to be inoperable for up to 2 hours for the performance of Surveillance tests. These tests may be on the affected RHR System or on some other plant system or component that necessitates placing the RHR System in an inoperable status during the performance. This is permitted because the core heat generation can be low enough and the heatup rate slow enough to allow some changes to the RHR subsystems or other operations requiring RHR flow interruption and loss of redundancy.

APPLICABILITY

In MODE 4, the RHR Shutdown Cooling System may be operated in the shutdown cooling mode to remove decay heat to maintain coolant temperature below 200°F. Otherwise, a recirculation pump is required to be in operation. However, when decay losses to ambient are sufficient to maintain reactor coolant temperature steady at the existing temperature the requirements for the RHR Shutdown Cooling System are not necessary to assure continued safe operation.

In MODES 1 and 2, and in MODE 3 with reactor steam dome pressure greater than or equal to the RHR cut in permissive pressure, this LCO is not applicable. Operation of the RHR System in the shutdown cooling mode is not allowed above

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

This Surveillance verifies that one RHR shutdown cooling subsystem or recirculation pump is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.9.2

RHR Shutdown Cooling System 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 RHR shutdown cooling subsystems and may also prevent water hammer, pump cavitation, and pumping of noncondensible gas into the reactor vessel.

Selection of RHR Shutdown Cooling System 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 RHR Shutdown Cooling System 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 RHR Shutdown Cooling System 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

RHR Shutdown Cooling System 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 subset 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. For these locations alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and determined to not challenge system OPERABILTIY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILTIY during the Surveillance interval.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Surveillance Frequency may vary by location susceptible to gas accumulation.

REFERENCES None.

BASES

APPLICABLE SAFETY ANALYSES (continued)

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 that would be generated if all of the metal in the cladding surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react;

d. The core is maintained in a coolable geometry; and

e. Adequate long term cooling capability is maintained.

The limiting single failures are discussed in Reference 11. The Design Basis Accident recirculation suction line break with the failure of the Division II battery results in the highest nominal peak cladding temperature. One ADS valve failure is analyzed as a limiting single failure for events requiring ADS operation. The remaining OPERABLE ECCS subsystems provide the capability to adequately cool the core and prevent excessive fuel damage.

The ECCS satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Each ECCS injection/spray subsystem and five ADS valves are required to be OPERABLE. The ECCS injection/spray subsystems are defined as the two CS subsystems, the two LPCI subsystems, and one HPCI System. The low pressure ECCS injection/spray subsystems are defined as the two CS subsystems and the two LPCI subsystems. Management of gas voids is important to ECCS injection/spray subsystem OPERABILITY.

With less than the required number of ECCS subsystems OPERABLE, the potential exists that during a limiting design basis LOCA concurrent with the worst case single failure, the limits specified in Reference 10 could be exceeded. All ECCS subsystems must therefore be OPERABLE to satisfy the single failure criterion required by Reference 10.

A LPCI subsystem is considered inoperable during alignment and operation for decay heat removal when below the actual RHR cut in permissive pressure in MODE 3, since transferring from the shutdown cooling mode to the LPCI mode, could result in voiding in the suction piping, pump cavitation, water hammer, and associated RHR System damage. At these low pressures and decay heat levels, a reduced complement of

BASES

LCO (continued)

ECCS subsystems should provide the required core cooling, thereby allowing operation of RHR shutdown cooling when necessary. The LPCI System cross-tie valves must be open to support OPERABILITY of both LPCI subsystems. Similarly, the LPCI swing bus (480 V MCC 72CF) is required to be energized to support both LPCI subsystems. Therefore, with the LPCI cross-tie valve not full open, or the LPCI swing bus not energized, both LPCI subsystems are declared inoperable.

APPLICABILITY

All ECCS subsystems are required to be OPERABLE during MODES 1, 2, and 3, when there is considerable energy in the reactor core and core cooling would be required to prevent fuel damage in the event of a break in the primary system piping. In MODES 2 and 3, when reactor steam dome pressure is ≤ 150 psig, ADS and HPCI are not required to be OPERABLE because the low pressure ECCS subsystems can provide sufficient flow below this pressure. ECCS requirements for MODES 4 and 5 are specified in LCO 3.5.2, "ECCS—Shutdown."

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable HPCI system. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable HPCI system and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

If any one low pressure ECCS injection/spray subsystem is inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE subsystems provide adequate core cooling during a LOCA. However, overall ECCS reliability is reduced, because a single failure in one of the remaining OPERABLE subsystems, concurrent with a LOCA, may result in the ECCS not being able to perform its intended safety function. The 7 day Completion Time is based on a reliability study (Ref. 12) that evaluated the impact on ECCS availability, assuming various components and subsystems were taken out of service. The results were used to calculate the average availability of ECCS equipment needed to mitigate the consequences of a LOCA as a function of allowed outage times (i.e., Completion Times).

BASES

SURVEILLANCE REQUIREMENTS (continued)

This SR is modified by a Note to indicate that when this test results in LPCI inoperability solely for performance of this required Surveillance, or when the LPCI swing bus automatic throwover scheme is inoperable due to EDG-12 being paralleled to the bus for required testing, entry into associated Conditions and Required Actions may be delayed for up to 12 hours until the required testing is completed. Upon completion of the Surveillance or expiration of the 12 hour allowance the swing bus must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. The LPCI swing bus automatic throwover scheme is typically not inoperable when EDG-12 is paralleled to the bus for testing purposes.

SR 3.5.1.3

The ECCS injection/spray subsystem flow path 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 injection/spray subsystems and may also prevent a water hammer, pump cavitation, and pumping of noncondensible gas into the reactor vessel.

Selection of ECCS injection/spray subsystem 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 configuration, such as stand-by versus operating conditions.

The ECCS injection/spray subsystem 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 injection/spray subsystems are not rendered inoperable by the accumulated gas (i.e., the system is sufficiently filled with water), the Surveillance may be declared met.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Accumulated gas should be eliminated or brought within the acceptance criteria limits.

ECCS injection/spray subsystem locations susceptible to gas accumulation are monitored and, if gas if 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 subset 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. For these locations alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and determined to not challenge system OPERABILITY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILITY during the Surveillance interval.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Surveillance Frequency may vary by locations susceptible to gas accumulation.

SR 3.5.1.4

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these 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 non-accident 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. For the HPCI System, this SR also includes the steam flow path for the turbine and the flow controller position.

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

This SR is modified by a note that exempts system vent flow paths opened under administrative control. The administrative control should be proceduralized and include stationing a dedicated individual at the system vent flow path who is in continuous communication with the operators in the control room. This individual will have a method to rapidly close the system vent flow path if directed.

SR 3.5.1.5

Verification that ADS primary containment pneumatic supply pressure is ≥ 75 psig ensures adequate air or nitrogen pressure for reliable ADS operation. The accumulator on each ADS valve provides pneumatic pressure for valve actuation. The design pneumatic supply pressure requirements for the accumulator are such that, following a failure of the pneumatic supply to the accumulator, at least five valve actuations can occur with the drywell at the long term drywell pressure of the design basis small break LOCA analysis (Ref. 15). The ECCS safety analysis assumes only one actuation to achieve the depressurization required for operation of the low pressure ECCS. This minimum required pressure of ≥ 75 psig is provided by the primary pneumatic supply system. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

B 3.5.2 ECCS-Shutdown

BASES

BACKGROUND

A description of the Core Spray (CS) System and the low pressure coolant injection (LPCI) mode of the Residual Heat Removal (RHR) System is provided in the Bases for LCO 3.5.1, "ECCS-Operating."

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 low pressure 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 judgement, that while in MODES 4 and 5, one low pressure ECCS injection/spray subsystem can maintain adequate reactor vessel water level. To provide redundancy, a minimum of two low pressure ECCS injection/spray subsystems are required to be OPERABLE in MODES 4 and 5.

The low pressure ECCS subsystems satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Two low pressure ECCS injection/spray subsystems are required to be OPERABLE. The low pressure ECCS injection/spray subsystems consist of two CS subsystems and two LPCI subsystems. Each CS subsystem consists of two motor driven pumps, piping, and valves to transfer water from the suppression pool or condensate storage tank (CST) to the reactor pressure vessel (RPV). Each LPCI subsystem consists of two motor driven pumps, piping, and valves to transfer water from the suppression pool to the RPV. In MODES 4 and 5, the RHR System cross tie valves are not required to be open provided action is taken to assure that OPERABLE LPCI subsystems are capable of injection to the reactor vessel. Management of gas voids is important to ECCS injection/spray subsystem OPERABILITY.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.5

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist 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.

In MODES 4 and 5, the RHR System may operate in the shutdown cooling mode to remove decay heat and sensible heat from the reactor. Therefore, RHR valves that are required for LPCI subsystem operation may be aligned for decay heat removal. This SR has been modified by two Notes. Note 1 allows one or both LPCI subsystems of the RHR System to be considered OPERABLE for the ECCS function if all the required valves in the LPCI flow path can be manually realigned (remote or local) to allow injection into the RPV, and the system is not otherwise inoperable. This will ensure adequate core cooling if an inadvertent RPV draindown should occur.

Note 2 exempts system vent flow paths opened under administrative control. The administrative control should be proceduralized and include stationing a dedicated individual at the system vent flow path who is in continuous communication with the operators in the control room. This individual will have a method to rapidly close the system vent flow path if directed.

REFERENCES

1. UFSAR, Section 6.3.2.

BASES

BACKGROUND (continued)

The RCIC pump is provided with a minimum flow bypass line, which discharges to the suppression pool. The valve in this line automatically opens to prevent pump damage due to overheating when other discharge line valves are closed. To ensure rapid delivery of water to the RPV and to minimize water hammer effects, the RCIC System discharge piping is kept full of water. The RCIC System is normally aligned to the CST. The height of water in the CST is sufficient to maintain the piping full of water up to the first isolation valve. The relative height of the feedwater line connection for RCIC is such that the water in the feedwater lines keeps the remaining portion of the RCIC discharge line full of water. Therefore, RCIC does not require a "keep fill" system.

APPLICABLE SAFETY ANALYSES

The function of the RCIC System is to respond to transient events by providing makeup coolant to the reactor. The RCIC System is not an Engineered Safety Feature System and no credit is taken in the safety analyses for RCIC System operation. Based on its contribution to the reduction of overall plant risk, however, the system is included in the Technical Specifications, as required by 10 CFR 50.36(c)(2)(ii).

LCO

The OPERABILITY of the RCIC System provides adequate core cooling such that actuation of any of the low pressure ECCS subsystems is not required in the event of RPV isolation accompanied by a loss of feedwater flow. The RCIC System has sufficient capacity for maintaining RPV inventory during an isolation event. Management of gas voids is important to RCIC System OPERABILITY.

APPLICABILITY

The RCIC System is required to be OPERABLE during MODE 1, and MODES 2 and 3 with reactor steam dome pressure > 150 psig, since RCIC is the primary non-ECCS water source for core cooling when the reactor is isolated and pressurized. In MODES 2 and 3 with reactor steam dome pressure ≤ 150 psig, and in MODES 4 and 5, RCIC is not required to be OPERABLE since the low pressure ECCS injection/spray subsystems can provide sufficient flow to the RPV.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

The RCIC System flow path 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 RCIC System and may also prevent a water hammer, pump cavitation, and pumping of noncondensible gas into the reactor vessel.

Selection of RCIC System locations susceptible to gas accumulation is based on a self-assessment of the piping configuration to identify were gases may accumulate and remain even after the system is filled and vented, and to identify vulnerable potential degassing flow paths. The review is supplemented by verification that installed high-point vents are actually at the system high points, including field verification to ensure pipe shapes and construction tolerances have not inadvertently created additional high points. Susceptible locations depend on plant and system configuration, such as stand-by versus operating conditions.

The RCIC System 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 RCIC Systems are 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.

RCIC System 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 subset 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. For these locations alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and

BASES

SURVEILLANCE REQUIREMENTS (continued)

determined to not challenge system OPERABILITY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILITY during the Surveillance interval.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Surveillance Frequency may vary by locations susceptible to gas accumulation.

SR 3.5.3.2

Verifying the correct alignment for manual, power operated, and automatic valves in the RCIC flow path provides assurance that the proper flow path will exist for RCIC 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. For the RCIC System, this SR also includes the steam flow path for the turbine and the flow controller position.

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

The Surveillance is modified by a Note which exempts system vent flow paths opened under administrative control. The administrative control should be proceduralized and include stationing a dedicated individual at the system vent flow path who is in continuous communication with the operators in the control room. This individual will have a method to rapidly close the system vent flow path if directed.

BASES

APPLICABLE SAFETY ANALYSES	Reference 1 contains the results of analyses used to predict primary containment pressure and temperature following large and small break LOCAs. The intent of the analyses is to demonstrate that the heat removal capacity of the RHR Suppression Pool Cooling System is adequate to maintain the primary containment conditions within design limits. The suppression pool temperature is calculated to remain below the design limit. The RHR Suppression Pool Cooling System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	During a DBA, a minimum of one RHR suppression pool cooling subsystem is required to maintain the primary containment peak pressure and temperature below design limits (Ref. 1). To ensure that these requirements are met, two RHR suppression pool cooling subsystems must be OPERABLE with power from two safety related independent power supplies. Therefore, in the event of an accident, at least one subsystem is OPERABLE assuming the worst case single active failure. An RHR suppression pool cooling subsystem is OPERABLE when one of the pumps, the heat exchanger, and associated piping, valves, instrumentation, and controls are OPERABLE. Management of gas voids is important to RHR Suppression Pool Cooling System OPERABILITY.
APPLICABILITY	In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to primary containment and cause a heatup and pressurization of primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, the RHR Suppression Pool Cooling System is not required to be OPERABLE in MODE 4 or 5.
ACTIONS	<u>A.1</u> With one RHR suppression pool cooling subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this Condition, the remaining RHR suppression pool cooling subsystem is adequate to perform the primary containment cooling function. However, the

BASES

SURVEILLANCE REQUIREMENTS (continued)

manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of 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.

SR 3.6.2.3.2

Verifying that each required RHR pump develops a flow rate ≥ 9,250 gpm while operating in the suppression pool cooling mode with flow through the associated heat exchanger ensures that pump performance has not degraded during the cycle. Flow is a normal test of centrifugal pump performance required by ASME Code, Section XI (Ref. 3). This test confirms one point on the pump design curve, and the results are indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

SR 3.6.2.3.3

RHR Suppression Pool Cooling System 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 RHR suppression pool cooling subsystems and may also prevent water hammer and pump cavitation.

Selection of RHR Suppression Pool Cooling System 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The RHR Suppression Pool Cooling System 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 RHR Suppression Pool Cooling System 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.

RHR Suppression Pool Cooling System 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 subset 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. For these locations alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and determined to not challenge system OPERABILITY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILITY during the Surveillance interval.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Surveillance Frequency may vary by location susceptible to gas accumulation.

REFERENCES

1. UFSAR, Section 6.2.

2. NEDC-32988-A, Revision 2, Technical Justification to Support Risk- Informed Modification to Selected Required End States for BWR Plants, December 2002.

3. ASME, Boiler and Pressure Vessel Code, Section XI.

BASES

APPLICABLE SAFETY ANALYSES

Reference 1 contains the results of analyses used to predict primary containment pressure and temperature following large and small break loss of coolant accidents. The intent of the analyses is to demonstrate that the pressure reduction capacity of the RHR Suppression Pool Spray System is adequate to maintain the primary containment conditions within design limits. The time history for primary containment pressure is calculated to demonstrate that the maximum pressure remains below the design limit.

The RHR Suppression Pool Spray System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

In the event of a DBA, a minimum of one RHR suppression pool spray subsystem is required to mitigate potential bypass leakage paths and maintain the primary containment peak pressure below the design limits (Ref. 1). To ensure that these requirements are met, two RHR suppression pool spray subsystems must be OPERABLE with power from two safety related independent power supplies. Therefore, in the event of an accident, at least one subsystem is OPERABLE assuming the worst case single active failure. An RHR suppression pool spray subsystem is OPERABLE when one of the RHR pumps, the heat exchanger, and associated piping, valves, instrumentation, and controls are OPERABLE. Management of gas voids is important to RHR Suppression Pool Spray System OPERABILITY.

APPLICABILITY

In MODES 1, 2, and 3, a DBA could cause pressurization of primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining RHR suppression pool spray subsystems OPERABLE is not required in MODE 4 or 5.

ACTIONS

A.1

With one RHR suppression pool spray subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE RHR suppression pool spray subsystem is adequate to perform the primary containment bypass leakage mitigation function. However, the overall reliability is reduced because a single

BASES

ACTIONS (continued)

that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.4.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR suppression pool spray mode flow path provides assurance that the proper flow paths will exist for system 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 is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable since the RHR suppression pool cooling mode is manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of 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.

SR 3.6.2.4.2

Verifying each RHR pump develops a flow rate ≥ 500 gpm while operating in the suppression pool spray mode with flow through the heat exchanger ensures that pump performance has not degraded during the cycle. Flow is a normal test of centrifugal pump performance required by Section XI of the ASME Code (Ref. 3). This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

SR 3.6.2.4.3

RHR Suppression Pool Spray System piping and components have

BASES

SURVEILLANCE REQUIREMENTS (continued)

the potential to develop voids and pockets of entrained gases. Preventing and managing gas intrusion and accumulation is necessary for proper operation of the RHR suppression pool spray subsystems and may also prevent water hammer and pump cavitation.

Selection of RHR Suppression Pool Spray System 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 RHR Suppression Pool Spray System 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 RHR Suppression Pool Spray System 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.

RHR Suppression Pool Spray System 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 subset 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. For these locations alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and

BASES

SURVEILLANCE REQUIREMENTS (continued)

determined to not challenge system OPERABILITY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILITY during the Surveillance interval.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Surveillance Frequency may vary by location susceptible to gas accumulation.

REFERENCES

1. UFSAR, Section 6.2.
2. NEDC-32988-A, Revision 2, Technical Justification to Support Risk- Informed Modification to Selected Required End States for BWR Plants, December 2002.
3. ASME, Boiler and Pressure Vessel Code, Section XI.

BASES

LCO (continued)

line may be used to allow pumps in one loop to discharge into the opposite loop's recirculation line to make a complete subsystem. Management of gas voids is important to RHR Shutdown Cooling System OPERABILITY.

Additionally, each RHR shutdown cooling subsystem is considered OPERABLE if it can be manually aligned (remote or local) in the shutdown cooling mode for removal of decay heat. Operation (either continuous or intermittent) of one subsystem can maintain and reduce the reactor coolant temperature as required.

APPLICABILITY

One RHR shutdown cooling subsystem must be OPERABLE in MODE 5, with irradiated fuel in the reactor pressure vessel, with the water level ≥ 20 ft 6 inches above the top of the RPV flange, and heat losses to ambient not greater than or equal to heat input to the reactor coolant to provide decay heat removal. RHR System requirements in other MODES are covered by LCOs in Section 3.4, Reactor Coolant System (RCS); Section 3.5, Emergency Core Cooling Systems (ECCS) and Reactor Core Isolation Cooling (RCIC) System; and Section 3.6, Containment Systems. RHR Shutdown Cooling System requirements in MODE 5 with irradiated fuel in the reactor pressure vessel and with the water level < 20 ft 6 inches above the RPV flange are given in LCO 3.9.8.

ACTIONS

A.1

With no RHR shutdown cooling subsystem OPERABLE, the availability of an alternate method of decay heat removal must be established within 1 hour. In this condition, the volume of water above the RPV flange provides adequate capability to remove decay heat from the reactor core. However, the overall reliability is reduced because loss of water level could result in reduced decay heat removal capability. The 1 hour Completion Time is based on decay heat removal function and the probability of a loss of the available decay heat removal capabilities. Furthermore,

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.7.1

This Surveillance demonstrates that the RHR shutdown cooling subsystem is capable of decay heat removal.

The verification includes assuring that the shutdown cooling subsystem is capable of taking suction from the reactor vessel and discharging back to the reactor vessel through an RHR heat exchanger with available cooling water. This SR does not require any testing or valve manipulation, rather, it involves verification that those valves not locked, sealed, or otherwise secured in the correct position, can be aligned to the correct position for shutdown cooling operation. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.9.7.2

RHR Shutdown Cooling system 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 required RHR shutdown cooling subsystem(s) and may also prevent water hammer, pump cavitation, and pumping of noncondensible gas into the reactor vessel.

Selection of RHR Shutdown Cooling System 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 RHR Shutdown Cooling System 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

RHR Shutdown Cooling System 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.

RHR Shutdown Cooling System 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 subset 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. For these locations alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and determined to not challenge system OPERABILITY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILITY during the Surveillance interval.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Surveillance Frequency may vary by location susceptible to gas accumulation.

REFERENCES None

BASES

LCO (continued)

opposite loop's recirculation line to make a complete subsystem. Management of gas voids is important to RHR Shutdown Cooling System OPERABILITY.

Additionally, each RHR shutdown cooling subsystem is considered OPERABLE if it can be manually aligned (remote or local) in the shutdown cooling mode for removal of decay heat. Operation (either continuous or intermittent) of one subsystem can maintain and reduce the reactor coolant temperature as required. However, to ensure adequate core flow to allow for accurate average reactor coolant temperature monitoring, nearly continuous operation of either an RHR pump or a recirculation pump is required. Note 1 is provided to allow a 2 hour exception to shut down the operating subsystem every 8 hours.

Note 2 is provided to allow a 2 hour exception for a single subsystem inoperability due to surveillance testing.

APPLICABILITY

Two RHR shutdown cooling subsystems are required to be OPERABLE, and one RHR pump or recirculation pump must be in operation in MODE 5, with irradiated fuel in the RPV, with the water level < 20 ft 6 inches above the top of the RPV flange, and heat losses to ambient not greater than or equal to heat input to the reactor coolant to provide decay heat removal. RHR System requirements in other MODES are covered by LCOs in Section 3.4, Reactor Coolant System (RCS); Section 3.5, Emergency Core Cooling Systems (ECCS) and Reactor Core Isolation Cooling (RCIC) System; and Section 3.6, Containment Systems. RHR Shutdown Cooling System requirements in MODE 5 with irradiated fuel in the RPV and with the water level ≥ 20 ft 6 inches above the RPV flange are given in LCO 3.9.7, "Residual Heat Removal (RHR-High Water Level."

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.9.8.2

This Surveillance demonstrates that the RHR shutdown cooling subsystem is capable of decay heat removal. The verification includes assuring that the shutdown cooling subsystem is capable of taking suction from the reactor vessel and discharging back to the reactor vessel through an RHR heat exchanger with available cooling water. This SR does not require any testing or valve manipulation, rather, it involves verification that those valves capable of being mispositioned are in the correct position.

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

SR 3.9.8.3

RHR Shutdown Cooling System 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 RHR shutdown cooling subsystems and may also prevent water hammer, pump cavitation, and pumping of noncondensible gas into the reactor vessel.

Selection of RHR Shutdown Cooling System 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 RHR Shutdown Cooling System 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

met. If it is determined by subsequent evaluation that the RHR Shutdown Cooling System 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.

RHR Shutdown Cooling System 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 subset of susceptible locations. Monitoring may not be practical for locations that are inaccessible due radiological or environmental conditions, the plant configuration, or personnel safety. For these locations alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and determined to not challenge system OPERABILITY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILITY during the Surveillance interval.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Surveillance Frequency may vary by location susceptible to gas accumulation.

REFERENCES None

BASES

LCO	Two RHRSW subsystems are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post accident heat loads, assuming the worst case single active failure occurs coincident with the loss of offsite power. An RHRSW subsystem is considered OPERABLE when: a. Two pumps are OPERABLE; and b. An OPERABLE flow path is capable of taking suction from the RHR Reservoir and transferring the water to the RHR heat exchangers at the assumed flow rate and returning the water to the RHR Reservoir via the cooling tower or cold weather bypass valves. An adequate suction source is not addressed in this LCO since the minimum net positive suction head (corresponding to a submergence at an elevation of 554.6 ft) is bounded by the 580 ft elevation requirements of LCO 3.7.2, "Emergency Equipment Cooling Water (EECW)/Emergency Equipment Service Water (EESW) System and Ultimate Heat Sink (UHS)."
APPLICABILITY	In MODES 1, 2, and 3, the RHRSW System is required to be OPERABLE to support the OPERABILITY of the RHR System for primary containment cooling (LCO 3.6.2.3, "Residual Heat Removal (RHR) Suppression Pool Cooling" and decay heat removal (LCO 3.4.8, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown"). The Applicability is therefore consistent with the requirements of these systems. Although the LCO for the RHRSW System is not applicable in MODES 4 and 5, the capability of the RHRSW System to perform its necessary related support functions may be required for OPERABILITY of supported systems.

BASES

LCO

The EECW/EESW system consists of two completely independent subsystems. In the event of a DBA, one subsystem of EECW/EESW is required to provide the minimum heat removal capability assumed in the safety analysis for the system to which it supplies cooling water. To ensure this requirement is met, two subsystems of EECW/EESW must be OPERABLE. At least one subsystem will operate, if the worst single active failure occurs coincident with the loss of offsite power.

An EECW/EESW subsystem is considered OPERABLE when it has an OPERABLE EECW pump, an OPERABLE EESW pump, an OPERABLE EECW/EESW heat exchanger, an OPERABLE EECW makeup tank, an OPERABLE EECW makeup pump, and OPERABLE flow paths to provide cooling water flow to the supported equipment and reject the heat to the division's RHR reservoir.

The OPERABILITY of the UHS is based on the OPERABILITY of each RHR reservoir. To be OPERABLE, a RHR reservoir must have sufficient capacity to accept the design heat load from the supported equipment. To accomplish this each reservoir water volume must be greater than 2,990,000 gallons (an indication of 25 feet) and the water temperature must be ≤ 80°F. In addition, the associated cooling tower and both fans must be OPERABLE.

Since the UHS relies on the combined heat capacity of the two RHR reservoirs to accomplish its design objectives, UHS OPERABILITY must also be based on the two reservoirs having a combined water volume of 5,980,000 gallons and a combined average water temperature of ≤ 80°F. Furthermore, the two reservoirs must be cross-connected, or capable of being cross-connected.

The isolation of the EECW cooling to components or systems may render those components or systems inoperable, but does not necessarily affect the OPERABILITY of the EECW/EESW System.

APPLICABILITY

In MODES 1, 2, and 3, the EECW/EESW System and UHS are required to be OPERABLE to support OPERABILITY of the equipment serviced by the EECW/EESW System. Therefore, the EECW/EESW System and UHS are required to be OPERABLE in these MODES.

Although the LCO for the EECW/EESW System and UHS is not applicable in MODES 4 and 5, the capability of the EECW/EESW System and UHS to perform their necessary related support functions may be required for OPERABILITY of supported systems.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.4 DC Sources-Operating

BASES

BACKGROUND

The DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety related equipment. As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure. The DC electrical power system also conforms to the recommendations of Regulatory Guide 1.6 (Ref. 2) and IEEE-308 (Ref. 3).

The DC power sources provide both motive and control power to selected safety related equipment, as well as circuit breaker control power for the nonsafety related 480 V loads that are connected to 480 V ESF buses. Two center-tapped 260 VDC batteries are provided for Class 1E loads. They are designated 2PA for Division I and 2PB for Division II. Each 260 VDC battery is divided into two 130 VDC batteries connected in series. Each 130 VDC battery section has a battery charger connected in parallel with their respective battery. Each 260 VDC battery has a spare battery charger that can replace either of the normal 130 VDC connected chargers. Each division's two 130 VDC batteries and their chargers are the source of DC control power for that respective division, including the respective EDG. Each 260 VDC source furnishes power to DC motors necessary for shutdown conditions.

During normal operation, the DC loads are powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to the battery charger, the DC loads are automatically powered from the batteries.

The DC power distribution system is described in more detail in Bases for LCO 3.8.7, "Distribution Systems-Operating," and LCO 3.8.8, "Distribution Systems-Shutdown."

Each battery has adequate storage capacity to carry the required load continuously for approximately 4 hours (Ref. 11).

ACTIONS (continued)

division. The 4 hour Completion Time (Required Action A.1) for restoration of an inoperable battery charger allows time to replace the inoperable charger with an OPERABLE spare battery charger, if available. The four hour limit is reasonable based on the remaining capability of the battery to carry the loads for this period. The 2 hour limit for Required Action B.1 is consistent with the allowed time for an inoperable DC Distribution System division. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 6) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and, if the DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown.

C.1

If the station service DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 8) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action C.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

BASES

APPLICABLE SAFETY ANALYSES (continued)

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 that would be generated if all of the metal in the cladding surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react;

d. The core is maintained in a coolable geometry; and

e. Adequate long term cooling capability is maintained.

The limiting single failures are discussed in Reference 11. The remaining OPERABLE ECCS subsystems provide the capability to adequately cool the core and prevent excessive fuel damage.

The ECCS satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Each ECCS injection/spray subsystem and five ADS valves are required to be OPERABLE. The ECCS injection/spray subsystems are defined as the two CS subsystems, the two LPCI subsystems, and one HPCI System. The low pressure ECCS injection/spray subsystems are defined as the two CS subsystems and the two LPCI subsystems. Management of gas voids is important to ECCS injection/spray subsystem OPERABILITY.

With less than the required number of ECCS subsystems OPERABLE, the potential exists that during a limiting design basis LOCA concurrent with the worst case single failure, the limits specified in Reference 10 could be exceeded. All ECCS subsystems must therefore be OPERABLE to satisfy the single failure criterion required by Reference 10.

A LPCI subsystem is considered inoperable during alignment and operation for decay heat removal when below the actual RHR cut in permissive pressure in MODE 3, since transferring from the shutdown cooling mode to the LPCI mode, could result in voiding in the suction piping, pump cavitation, water hammer, and associated RHR System damage. At these low pressures and decay heat levels, a reduced complement of

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

Reactor Vessel Water Level-Low Low, Level 2 signals are initiated from four level 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.

The Reactor Vessel Water Level-Low Low, Level 2 Allowable Value is high enough such that for complete loss of feedwater flow, the Reactor Core Isolation Cooling (RCIC) System flow with HPCI assumed to fail will be sufficient to avoid initiation of low pressure ECCS at Reactor Vessel Water Level-Low Low Low, Level 1.

Four channels of Reactor Vessel Water Level-Low Low, Level 2 Function are required to be OPERABLE only when HPCI is required to be OPERABLE to ensure that no single instrument failure can preclude HPCI initiation. Refer to LCO 3.5.1 for HPCI Applicability Bases.

3.b. Drywell Pressure-High

High pressure in the drywell could indicate a break in the RCPB. The HPCI System is initiated upon receipt of the Drywell Pressure-High Function in order to minimize the possibility of fuel damage. The Drywell Pressure-High Function, along with the Reactor Water Level-Low Low, Level 2 Function, is directly assumed in the analysis of the recirculation line break (Ref. 4). 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.

High drywell pressure signals are initiated from four pressure transmitters that sense drywell pressure. The Allowable Value was selected to be as low as possible to be indicative of a LOCA inside primary containment.

Four channels of the Drywell Pressure-High Function are required to be OPERABLE when HPCI is required to be OPERABLE, except when reactor steam dome pressure is less than 550 psig, to ensure that no single instrument failure can preclude HPCI initiation. Refer to LCO 3.5.1 for the Applicability Bases for the HPCI System. The injection function of Drywell Pressure-High is not required to be

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

OPERABLE when reactor steam dome pressure is less than 550 psig since it may be inhibited in that pressure range by Reactor Vessel Water Level - High, Level 8.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Two channels of Suppression Pool Water Level-High Function are required to be OPERABLE only when HPCI is required to be OPERABLE to ensure that no single instrument failure can preclude HPCI swap to suppression pool source. Refer to LCO 3.5.1 for HPCI Applicability Bases.

3.f. Manual Initiation

The Manual Initiation channel provides manual initiation capability by means of individual component controls. There is one manual initiation channel for the HPCI System.

The Manual Initiation Function is not assumed in any accident or transient analyses in the UFSAR. However, the Function is retained for overall redundancy and diversity of the HPCI function as required by the NRC in the plant licensing basis.

There is no Allowable Value for this Function since the channel is mechanically actuated based solely on the position of individual controls. The Manual Initiation Function is required to be OPERABLE only when the HPCI System is required to be OPERABLE, except when reactor steam dome pressure is less than 550 psig. Refer to LCO 3.5.1 for HPCI Applicability Bases. The injection function of Manual Initiation is not required to be OPERABLE when reactor steam dome pressure is less than 550 psig since it may be inhibited in that pressure range by Reactor Vessel Water Level - High, Level 8.

Automatic Depressurization System

4.a, 5.a. Reactor Vessel Water Level-Low Low Low, Level 1

Low RPV water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, ADS receives one of the signals necessary for initiation from this Function. The Reactor Vessel Water Level-Low Low Low, Level 1 is one of the Functions assumed to be OPERABLE and capable of initiating the ADS during the accident analyzed in Reference 1. 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.

Reactor Vessel Water Level-Low Low Low, Level 1 signals are

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

initiated from four level 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. Four channels of

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The individual Functions are required to be OPERABLE in MODE 1, and in MODES 2 and 3 with reactor steam dome pressure > 150 psig since this is when RCIC is required to be OPERABLE, except as noted for the Manual Initiation Function. (Refer to LCO 3.5.3 for Applicability Bases for the RCIC System.)

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

1. Reactor Vessel Water Level—Low Low, Level 2

Low reactor pressure vessel (RPV) water level indicates that normal feedwater flow is insufficient to maintain reactor vessel water level and that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, the RCIC System is initiated at Level 2 to assist in maintaining water level above the top of the active fuel.

Reactor Vessel Water Level—Low Low, Level 2 signals are initiated from four level 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.

The Reactor Vessel Water Level—Low Low, Level 2 Allowable Value is set high enough such that for complete loss of feedwater flow, the RCIC System flow with high pressure coolant injection assumed to fail will be sufficient to avoid initiation of low pressure ECCS at Level 1.

Four channels of Reactor Vessel Water Level—Low Low, Level 2 Function are available and are required to be OPERABLE when RCIC is required to be OPERABLE to ensure that no single instrument failure can preclude RCIC initiation. Refer to LCO 3.5.3 for RCIC Applicability Bases.

2. Reactor Vessel Water Level—High, Level 8

High RPV water level indicates that sufficient cooling water inventory exists in the reactor vessel such that there is no danger to the fuel. Therefore, the Level 8 signal is used to close the RCIC steam supply, steam supply bypass, and cooling water supply valves to prevent overflow into the

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Two channels of Condensate Storage Tank Level – Low Function are available and are required to be OPERABLE when RCIC is required to be OPERABLE to ensure that no single instrument failure can preclude RCIC swap to suppression pool source. Refer to LCO 3.5.3 for RCIC Applicability Bases.

4. Manual Initiation

The Manual Initiation channel provides manual initiation capability to individual valves. There is one manual initiation channel for the RCIC System.

The Manual Initiation Function is not assumed in any accident or transient analyses in the UFSAR. However, the Function is retained for overall redundancy and diversity of the RCIC function as required by the NRC in the plant licensing basis.

There is no Allowable Value for this Function since the channel is mechanically actuated based solely on the position of the valve control. One channel of Manual Initiation is required to be OPERABLE when RCIC is required to be OPERABLE, except when reactor steam dome pressure is less than 550 psig. The injection function of Manual Initiation is not required to be OPERABLE when reactor steam dome pressure is less than 550 psig since it may be inhibited in that pressure range by Reactor Vessel Water Level – High, Level 8.

ACTIONS

A Note has been provided to modify the ACTIONS related to RCIC System 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 RCIC System 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 RCIC System instrumentation channel.

B 3.3 INSTRUMENTATION

B 3.3.8.1 Loss of Power (LOP) Instrumentation

BASES

BACKGROUND

Successful operation of the required safety functions of the Emergency Core Cooling Systems (ECCS) is dependent upon the availability of adequate power sources for energizing the various components such as pump motors, motor operated valves, and the associated control components. The LOP instrumentation monitors the 4.16 kV emergency buses. Offsite power is the preferred source of power for the 4.16 kV emergency buses. If the monitors determine that insufficient power is available, the buses are disconnected from the offsite power sources and connected to the onsite emergency diesel generator (EDG) power sources.

Each 4.16 kV emergency bus has its own independent LOP instrumentation and associated trip logic. The voltage for each bus is monitored at two levels, which can be considered as two different undervoltage Functions: Loss of Voltage and 4.16 kV Emergency Bus Undervoltage Degraded Voltage. Bus undervoltage instrumentation for the loss of voltage function monitors the Class 1E emergency bus for a level of voltage that is insufficient to operate the required ESF equipment caused from a loss of the preferred off-site power source. Bus undervoltage instrumentation for the degraded voltage function monitors the Class 1E bus for a level of voltage from the preferred off-site power source that is insufficient to operate the required ESF equipment, but is not low enough to cause the loss of voltage function to operate, thereby ensuring adequate voltage for ESF operation and protecting the ESF equipment from damage caused by low voltage operation. Both loss of voltage functions within a bus cause identical actions, Class 1E bus isolation, load shedding to prevent overloading of the associated EDG, transfers, and automatic starting of the associated EDG and load sequencer.

Each Function is monitored by four undervoltage relays that compare measured input signals with pre-established setpoints in each bus. When the setpoint of the undervoltage relay is exceeded continuously for longer than the time delay, the channel output relay actuates. The outputs of the undervoltage relays are arranged in a one-out-of-two-taken-twice logic (i.e., two trip systems) for each Function in each bus. The input signal to the undervoltage relays is at

BASES

BACKGROUND (continued)

the 120 Volt level and is derived from two independent step-down bus potential transformers (PT). Each PT is electrically connected to the associated Class 1E bus when the off-site power source is supplying the bus. Each bus uses one potential transformer connected to the line side of the Class 1E bus feed breaker providing input to one of the redundant wired pair of undervoltage relays, and a second potential transformer connected to the load side of the bus feed breaker providing input to the other redundant wired pair of undervoltage relays. A coincident trip in each redundant pair of undervoltage relay channels then causes a LOP trip signal to the trip logic. Each Function has a time delay to prevent actuation of the trip logic for a pre-established time limit, unique for the associated divisional off-site power source.

Both LOP Functions are automatically bypassed whenever the associated EDG is supplying its respective ESF bus. This ensures that the voltage dips encountered during load sequencing on the EDG will not interact with the load shedding feature.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The LOP instrumentation is required for Engineered Safety Features to function in any accident with a loss of offsite power. The required channels of LOP instrumentation ensure that the ECCS and other assumed systems powered from the EDGs, provide plant protection in the event of any of the Reference 2, 3, and 4 analyzed accidents in which a loss of offsite power is assumed. The initiation of the EDGs on loss of offsite power, and subsequent initiation of the ECCS, ensure that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

Accident analyses credit the loading of the EDG based on the loss of offsite power during a loss of coolant accident. The diesel starting and loading times have been included in the delay time associated with each safety system component requiring EDG supplied power following a loss of offsite power.

BASES

LCO

To ensure compliance with the assumptions of the turbine SJAE line failure event (Ref. 1), the fission product release rate should be consistent with a noble gas release to the reactor coolant of 100 μCi/MWt-second after decay of 30 minutes. The LCO is established consistent with this requirement and is conservatively based on the previously licensed thermal power of 3430 MWt (3430 MWt x 100 μCi/MWt-second = 340 mCi/second).

APPLICABILITY

The LCO is applicable when steam is being exhausted to the main condenser and the resulting noncondensibles are being processed via the Main Condenser Offgas System. This occurs during MODE 1, and during MODES 2 and 3 with any main steam line not isolated and the SJAE in operation. In MODES 4 and 5, steam is not being exhausted to the main condenser and the requirements are not applicable.

ACTIONS

A.1

If the offgas radioactivity rate limit is exceeded, 72 hours are allowed to restore the gross radioactivity rate to within the limit. The 72 hour Completion Time is reasonable, based on engineering judgment, the time required to complete the Required Action, the large margins associated with permissible dose and exposure limits, and the low probability of a Main Condenser Offgas System or SJAE line rupture.

B.1, B.2, and B.3.

If the gross radioactivity rate is not restored to within the limits in the associated Completion Time, all main steam lines or the SJAE must be isolated. This isolates the Main Condenser Offgas System from the source of the radioactive steam. The main steam lines are considered isolated if at least one main steam isolation valve in each main steam line is closed, and at least one main steam line drain valve in each drain line is closed. The 12 hour Completion Time is reasonable, based on operating experience, to perform the actions from full power conditions in an orderly manner and without challenging unit systems.

ENCLOSURE 5 TO
NRC-17-0057

Summary of Excessive Detail Removed from the
Fermi 2 UFSAR

Summary Report of Excessive Detail Removal

The following is a summary report of excessive detail that has been removed in Revision 21 to the Fermi 2 UFSAR. These changes are consistent with Nuclear Energy Institute (NEI) 98-03, "Guidelines for Updating Final Safety Analysis Reports", Revision 1, June 1999, as endorsed by the NRC. The Fermi 2 UFSAR continues to adequately describe the design bases, plant safety analyses, and design and operation of structures, systems, and components (SSCs).

LCR No.	Excessive Detail Removed	Basis for Removal
11-033-UFS	Deleted the alternate identification from a valve in UFSAR Figure 10.4-7, sheet 1.	The UFSAR drawing retains the installed valve with a unique identification number. The alternate valve identification number is not required.
16-073-UFS	Deleted the specific discussion of periodicity of general employee training in UFSAR Section 13.2.1.4.4.	The UFSAR retains the discussion of types of employees and general training topics. Specific frequencies of training are controlled by the training program using a systematic approach.
17-039-UFS	Deleted the specific numerical result for the probabilistic tornado missile damage analysis in UFSAR Section 3.5.1.3.2.3.	The UFSAR retains the description of the analysis methodology and the conclusion that regulatory acceptance criterion is met. The specific numerical value of the analysis result is not required.

ENCLOSURE 6 TO
NRC-17-0057

10 CFR 72.48 Evaluation Summary Report

72.48 EVALUATION SUMMARY

72.48 Evaluation No:	16-0038 Rev. 0	**UFSAR Revision No.**	N/A
Reference Document:	DCR 16-1030	**Section(s)**	
		Table(s)	
		Figure Change	☐ Yes ☒ No

Title of Change: **Document Change Request (DCR) 16-1030 for 35.710.042 Revision 8, "Multi-Purpose Canister (MPC) Loading"**

In the Independent Spent Fuel Storage Installation (ISFSI) procedure 35.710.042, "Multi-Purpose Canister (MPC) Loading," a step is being changed to check full engagement of lifting bracket threaded studs into the HI-STORM lift anchor blocks by verifying that not more than 10-1/2 inches of the top of the threaded stud protrudes above the top of the lifting bracket strongback, rather than not more than 9-1/2 inches. This effectively changes the minimum amount of thread engagement from at least 6-1/2 inches to at least 5-1/2 inches.

The evaluation determined that, although the procedure change adversely affects the design function of the lifting connection by reducing the amount of thread engagement, there is still ample safety factor with the lesser amount of thread engagement. All eight questions of the 72.48 Evaluation were answered "No", thus prior NRC approval to change the procedure is not required.

Security-Related Information – Withhold Under 10 CFR 2.390

CD 1

Fermi 2 UFSAR Revision 21
(Contains SRI, Not For Public Use)

CD 1 contains Security-Related Information – Withhold Under 10 CFR 2.390.
When separated from CD 1, this cover sheet is decontrolled.

CD 2

Fermi 2 UFSAR Revision 21
(For Public Use)