

10 CFR 50.90

January 30, 2017

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

Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277 and 50-278

Subject: Application to Revise Technical Specifications to Adopt TSTF-542,
"Reactor Pressure Vessel Water Inventory Control," Revision 2

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (EGC) requests an amendment to the Technical Specifications (TS) for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3.

The proposed changes replace existing Technical Specifications (TS) requirements related to "operations with a potential for draining the reactor vessel" (OPDRVs) with new requirements on Reactor Pressure Vessel Water Inventory Control (RPV WIC) to protect Safety Limit 2.1.1.3. Safety Limit 2.1.1.3 requires reactor vessel water level to be greater than the top of active irradiated fuel.

EGC has concluded that the proposed changes present no significant hazards consideration under the standards set forth in 10 CFR 50.92.

The proposed changes have been reviewed by the PBAPS Plant Operations Review Committee in accordance with the requirements of the EGC Quality Assurance Program.

This amendment request contains no regulatory commitments.

Attachment 1 provides an evaluation of the proposed changes. Attachment 2 provides the existing TS pages marked up to show the proposed changes. Attachment 3 provides the existing Bases pages marked up to show the proposed changes (information only).

EGC requests approval of the proposed amendment by September 30, 2017 in support of the Fall 2017 Unit 3 refueling outage. Once approved, the amendments shall be implemented on both units prior to the next refueling outage on either unit.

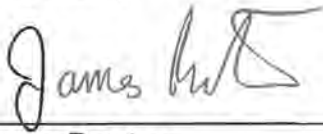
U.S. Nuclear Regulatory Commission
Application to Revise TS to Adopt TSTF-542
Docket Nos. 50-277 and 50-278
January 30, 2017
Page 2

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

If you have any questions or require additional information, please contact Stephanie J. Hanson at (610) 765-5143.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 30th day of January 2017.

Respectfully,



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

Attachments: 1. Evaluation of Proposed Changes
2. Markup of Technical Specifications Pages
3. Markup of Technical Specifications Bases Pages (For Information Only)

cc: USNRC Region I, Regional Administrator w/ attachments
USNRC Senior Resident Inspector, PBAPS "
USNRC Project Manager, PBAPS "
R. R. Janati, Pennsylvania Bureau of Radiation Protection "
S. T. Gray, State of Maryland "

ATTACHMENT 1

Evaluation of Proposed Changes

Peach Bottom Atomic Power Station, Units 2 and 3

Renewed Facility Operating License Nos. DPR-44 and DPR-56

Docket Nos. 50-277 and 50-278

**Subject: Application to Revise Technical Specifications to Adopt TSTF-542,
"Reactor Pressure Vessel Water Inventory Control," Revision 2**

1.0 DESCRIPTION

2.0 ASSESSMENT

2.1 Applicability of Published Safety Evaluation

2.2 Variations

3.0 REGULATORY ANALYSIS

3.1 NO SIGNIFICANT HAZARDS CONSIDERATION

4.0 ENVIRONMENTAL CONSIDERATION

5.0 REFERENCES

1.0 DESCRIPTION

Exelon Generation Company, LLC (EGC), proposes changes to the Technical Specifications (TS), Appendix A of Renewed Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, respectively.

The proposed changes replace existing Technical Specifications (TS) requirements related to "operations with a potential for draining the reactor vessel" (OPDRVs) with new requirements on Reactor Pressure Vessel Water Inventory Control (RPV WIC) to protect Safety Limit 2.1.1.3. Safety Limit 2.1.1.3 requires reactor vessel water level to be greater than the top of active irradiated fuel.

2.0 ASSESSMENT

2.1 Applicability of Published Safety Evaluation

EGC has reviewed the safety evaluation provided to the Technical Specifications Task Force on December 20, 2016, as well as the information provided in TSTF-542. EGC has concluded that the justifications presented in TSTF-542 and the safety evaluation prepared by the NRC staff are applicable to Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, and justify this amendment for the incorporation of the changes to the PBAPS TS.

The following PBAPS TS reference or are related to OPDRVs and are affected by the proposed changes:

- 3.3.5.1 Emergency Core Cooling System (ECCS) Instrumentation
- 3.3.6.1 Primary Containment Isolation Instrumentation
- 3.3.6.2 Secondary Containment Isolation Instrumentation
- 3.3.7.1 Main Control Room Emergency Ventilation (MCREV) System Instrumentation
- 3.5.2 ECCS - Shutdown
- 3.6.1.3 Primary Containment Isolation Valves (PCIVs)
- 3.6.4.1 Secondary Containment
- 3.6.4.2 Secondary Containment Isolation Valves (SCIVs)
- 3.6.4.3 Standby Gas Treatment (SGT) System
- 3.7.4 Main Control Room Emergency Ventilation (MCREV) System
- 3.8.2 AC Sources - Shutdown
- 3.8.5 DC Sources - Shutdown
- 3.8.8 Distribution Systems - Shutdown

2.2 Variations

EGC is proposing the following variations from the TS changes described in TSTF-542. These variations do not affect the applicability of TSTF-542 or the NRC staff's safety evaluation to the proposed license amendment.

EGC proposes to change the number for the OPDRV TS to TS 3.5.4 and the Instrumentation section to TS 3.3.5.4 for consistency purposes. These differences are administrative and do not affect the applicability of TSTF-542 to the PBAPS TS.

PBAPS design for RWCU isolation is on Reactor Vessel Water Level - Low (Level 3), not Reactor Vessel Water Level - Low, Low (Level 2). Therefore, it is appropriate to revise PBAPS TS Table 3.3.5.4.-1 to reflect this design difference for PBAPS.

EGC proposes to revise PBAPS TS Surveillance Requirement (SR) 3.5.4.8 and TS Bases 3.3.5.4 to clarify that for manual initiations PBAPS utilizes hand switches in lieu of push buttons.

EGC is proposing to add a note to TS Table 3.3.5.4-1 (RPV WIC Instrumentation) to clarify the intent of allowing credit for an OPERABLE Low Pressure Coolant Injection subsystem when it is aligned and operating in the decay heat removal mode of RHR. This is appropriate since the associated RHR pump minimum flow valve (while operating in the decay heat removal mode) is closed and deactivated to prevent inadvertent vessel drain down events. Because the minimum flow valve is closed and deactivated, the associated TS Table 3.3.5.4-1 Function 2.b would not be required to be OPERABLE. Without the note, TS 3.3.5.4 Condition D would require that the associated RHR pump be declared inoperable, which would be contrary to the intent of the LCO 3.5.4 Note which allows the LPCI subsystem to be OPERABLE when aligned for decay heat removal.

3.0 REGULATORY ANALYSIS

3.1 No Significant Hazards Determination

Exelon Generation Company, LLC (EGC), proposes changes to the Technical Specifications (TS), Appendix A of Renewed Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, respectively.

EGC requests adoption of TSTF-542 "Reactor Pressure Vessel Water Inventory Control," which is an approved change to the Standard Technical Specifications (STS), into the PBAPS TS. The proposed amendment replaces the existing requirements in the TS related to "operations with a potential for draining the reactor vessel" (OPDRVs) with new requirements on Reactor Pressure Vessel Water Inventory Control (RPV WIC) to protect Safety Limit 2.1.1.3. Safety Limit 2.1.1.3 requires reactor vessel water level to be greater than the top of active irradiated fuel.

EGC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

Response: No.

The proposed changes replace existing TS requirements related to OPDRVs with new requirements on RPV WIC that will protect Safety Limit 2.1.1.3. Draining of RPV water inventory in Mode 4 (i.e., cold shutdown) and Mode 5 (i.e., refueling) is not an accident previously evaluated and, therefore, replacing the existing TS controls to prevent or mitigate such an event with a new set of controls has no effect on any accident previously evaluated. RPV water inventory control in Mode 4 or Mode 5 is not an initiator of any accident previously evaluated. The existing OPDRV controls or the proposed RPV WIC controls are not mitigating actions assumed in any accident previously evaluated.

The proposed changes reduce the probability of an unexpected draining event (which is not a previously evaluated accident) by imposing new requirements on the limiting time in which an unexpected draining event could result in the reactor vessel water level dropping to the top of the active fuel (TAF). These controls require cognizance of the plant configuration and control of configurations with unacceptably short drain times. These requirements reduce the probability of an unexpected draining event. The current TS requirements are only mitigating actions and impose no requirements that reduce the probability of an unexpected draining event.

The proposed changes reduce the consequences of an unexpected draining event (which is not a previously evaluated accident) by requiring an Emergency Core Cooling System (ECCS) subsystem to be operable at all times in Modes 4 and 5. The current TS requirements do not require any water injection systems, ECCS or otherwise, to be Operable in certain conditions in Mode 5. The change in requirement from two ECCS subsystems to one ECCS subsystem in Modes 4 and 5 does not significantly affect the consequences of an unexpected draining event because the proposed Actions ensure equipment is available within the limiting drain time that is as capable of mitigating the event as the current requirements. The proposed controls provide escalating compensatory measures to be established as calculated drain times decrease, such as verification of a second method of water injection and additional confirmations that containment and/or filtration would be available if needed.

The proposed changes reduce or eliminate some requirements that were determined to be unnecessary to manage the consequences of an unexpected draining event, such as automatic initiation of an ECCS subsystem and control room ventilation. These changes do not affect the consequences of any accident previously evaluated since a draining event in Modes 4 and 5 is not a previously evaluated accident and the requirements are not needed to adequately respond to a draining event.

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

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

Response: No.

The proposed changes replace existing TS requirements related to OPDRVs with new requirements on RPV WIC that will protect Safety Limit 2.1.1.3. The proposed changes will not alter the design function of the equipment involved. Under the proposed changes, some systems that are currently required to be operable during OPDRVs would be required to be available within the limiting drain time or to be in service depending on the limiting drain time. Should those systems be unable to be placed into service, the consequences are no different than if those systems were unable to perform their function under the current TS requirements.

The event of concern under the current requirements and the proposed changes are an unexpected draining event. The proposed changes do not create new failure mechanisms, malfunctions, or accident initiators that would cause a draining event or a new or different kind of accident not previously evaluated or included in the design and licensing bases.

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

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The proposed changes replace existing TS requirements related to OPDRVs with new requirements on RPV WIC. The current requirements do not have a stated safety basis and no margin of safety is established in the licensing basis. The safety basis for the new requirements is to protect Safety Limit 2.1.1.3. New requirements are added to determine the limiting time in which the RPV water inventory could drain to the top of the fuel in the reactor vessel should an unexpected draining event occur. Plant configurations that could result in lowering the RPV water level to the TAF within one hour are now prohibited. New escalating compensatory measures based on the limiting drain time replace the current controls. The proposed TS establish a safety margin by providing defense-in-depth to ensure that the Safety Limit is protected and to protect the public health and safety. While some less restrictive requirements are proposed for plant configurations with long calculated drain times, the overall effect of the change is to improve plant safety and to add safety margin.

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

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

4.0 ENVIRONMENTAL CONSIDERATION

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

5.0 REFERENCES

1. TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control," dated December 29, 2016.
2. Final Safety Evaluation of Technical Specifications Task Force Traveler TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control" (TAC No. MF3487) ADAMS Accession No. ML16343B065

ATTACHMENT 2

Markup of Technical Specifications Pages

Peach Bottom Atomic Power Station Units 2 and 3

Renewed Facility Operating License Nos. DPR-44 and DPR-56

Docket Nos. 50-277 and 50-278

Revised Technical Specifications Pages

Unit 2 TS Pages

i	3.3-58	3.6-35
ii	3.3-59	3.6-36
1.1-3	3.5-1	3.6-38
3.3-32	3.5-8	3.6-40
3.3-33	3.5-9	3.6-41
3.3-35	3.5-10	3.7-7
3.3-39	3.5-11	3.7-8
3.3-40	3.5-12	3.7-9
3.3-47a*	3.5-15*	3.8-21
3.3-47b*	3.5-16*	3.8-22
3.3-47c*	3.5-17*	3.8-23
3.3-47d*	3.5-18*	3.8-35
3.3-50	3.6-12	3.8-44
3.3-54	3.6-34	3.8-45

Unit 3 TS Pages

i	3.3-58	3.6-35
ii	3.3-59	3.6-36
1.1-3	3.5-1	3.6-38
3.3-32	3.5-8	3.6-40
3.3-33	3.5-9	3.6-41
3.3-35	3.5-10	3.7-7
3.3-39	3.5-11	3.7-8
3.3-40	3.5-12	3.7-9
3.3-47a*	3.5-15*	3.8-21
3.3-47b*	3.5-16*	3.8-22
3.3-47c*	3.5-17*	3.8-23
3.3-47d*	3.5-18*	3.8-35
3.3-50	3.6-12	3.8-44
3.3-54	3.6-34	3.8-45

*New TS Page

TABLE OF CONTENTS

1.0	USE AND APPLICATION	1.1-1
1.1	Definitions	1.1-1
1.2	Logical Connectors	1.2-1
1.3	Completion Times	1.3-1
1.4	Frequency	1.4-1
2.0	SAFETY LIMITS (SLs)	2.0-1
2.1	SLs	2.0-1
2.2	SL Violations	2.0-1
3.0	LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY	3.0-1
3.0	SURVEILLANCE REQUIREMENT (SR) APPLICABILITY	3.0-4
3.1	REACTIVITY CONTROL SYSTEMS	3.1-1
3.1.1	SHUTDOWN MARGIN (SDM)	3.1-1
3.1.2	Reactivity Anomalies	3.1-5
3.1.3	Control Rod OPERABILITY	3.1-7
3.1.4	Control Rod Scram Times	3.1-12
3.1.5	Control Rod Scram Accumulators	3.1-15
3.1.6	Rod Pattern Control	3.1-18
3.1.7	Standby Liquid Control (SLC) System	3.1-20
3.1.8	Scram Discharge Volume (SDV) Vent and Drain Valves	3.1-26
3.2	POWER DISTRIBUTION LIMITS	3.2-1
3.2.1	AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)	3.2-1
3.2.2	MINIMUM CRITICAL POWER RATIO (MCPR)	3.2-2
3.2.3	LINEAR HEAT GENERATION RATE (LHGR)	3.2-4
3.3	INSTRUMENTATION	3.3-1
3.3.1.1	Reactor Protection System (RPS) Instrumentation	3.3-1
3.3.1.2	Wide Range Neutron Monitor (WRNM) Instrumentation	3.3-10
3.3.2.1	Control Rod Block Instrumentation	3.3-16
3.3.2.2	Feedwater and Main Turbine High Water Level Trip Instrumentation	3.3-22
3.3.3.1	Post Accident Monitoring (PAM) Instrumentation	3.3-24
3.3.3.2	Remote Shutdown System	3.3-27
3.3.4.1	Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation	3.3-29
3.3.4.2	End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation	3.3-31a thru 3.3-31c
3.3.5.1	Emergency Core Cooling System (ECCS) Instrumentation ..	3.3-32
3.3.5.2	Reactor Core Isolation Cooling (RCIC) System Instrumentation	3.3-44
3.3.5.3	Not Used	3.3.47a
3.3.5.4	Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation	3.3.47b
3.3.6.1	Primary Containment Isolation Instrumentation	3.3-48
3.3.6.2	Secondary Containment Isolation Instrumentation	3.3-55
3.3.7.1	Main Control Room Emergency Ventilation (MCREV) System Instrumentation	3.3-59
3.3.8.1	Loss of Power (LOP) Instrumentation	3.3-61
3.3.8.2	Reactor Protection System (RPS) Electric Power Monitoring	3.3-66

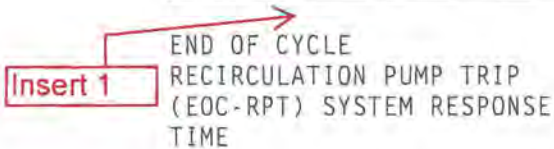
(continued)

TABLE OF CONTENTS (continued)

3.4	REACTOR COOLANT SYSTEM (RCS)	3.4-1
3.4.1	Recirculation Loops Operating	3.4-1
3.4.2	Jet Pumps	3.4-6
3.4.3	Safety Relief Valves (SRVs) and Safety Valves (SVs) ...	3.4-8
3.4.4	RCS Operational LEAKAGE	3.4-10
3.4.5	RCS Leakage Detection Instrumentation	3.4-12
3.4.6	RCS Specific Activity	3.4-14
3.4.7	Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown	3.4-16
3.4.8	Residual Heat Removal (RHR) Shutdown Cooling System—Cold Shutdown	3.4-19
3.4.9	RCS Pressure and Temperature (P/T) Limits	3.4-21
3.4.10	Reactor Steam Dome Pressure	3.4-28
3.5	EMERGENCY CORE COOLING SYSTEMS (ECCS), RPV WATER INVENTORY CONTROL (WIC) , AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM	3.5-1
3.5.1	ECCS—Operating	3.5-1
3.5.2	ECCS—Shutdown	3.5-8
3.5.3	RCIC System	3.5-12
3.5.4	RPV Water Inventory Control	3.5-13
3.6	CONTAINMENT SYSTEMS	3.6-1
3.6.1.1	Primary Containment	3.6-1
3.6.1.2	Primary Containment Air Lock	3.6-3
3.6.1.3	Primary Containment Isolation Valves (PCIVs)	3.6-8
3.6.1.4	Drywell Air Temperature	3.6-17
3.6.1.5	Reactor Building-to-Suppression Chamber Vacuum Breakers	3.6-18
3.6.1.6	Suppression Chamber-to-Drywell Vacuum Breakers	3.6-21
3.6.2.1	Suppression Pool Average Temperature	3.6-23
3.6.2.2	Suppression Pool Water Level	3.6-26
3.6.2.3	Residual Heat Removal (RHR) Suppression Pool Cooling	3.6-27
3.6.2.4	Residual Heat Removal (RHR) Suppression Pool Spray ...	3.6-29
3.6.2.5	Residual Heat Removal (RHR) Drywell Spray	3.6-30a
3.6.3.1	Deleted	3.6-31
3.6.3.2	Primary Containment Oxygen Concentration	3.6-33
3.6.4.1	Secondary Containment	3.6-34
3.6.4.2	Secondary Containment Isolation Valves (SCIVs)	3.6-36
3.6.4.3	Standby Gas Treatment (SGT) System	3.6-40
3.7	PLANT SYSTEMS	3.7-1
3.7.1	High Pressure Service Water (HPSW) System	3.7-1
3.7.2	Emergency Service Water (ESW) System and Normal Heat Sink	3.7-3
3.7.3	Emergency Heat Sink	3.7-5
3.7.4	Main Control Room Emergency Ventilation (MCREV) System	3.7-7
3.7.5	Main Condenser Offgas	3.7-10

(continued)

1.1 Definitions (continued)

Insert 1
END OF CYCLE
RECIRCULATION PUMP TRIP
(EOC-RPT) SYSTEM RESPONSE
TIME

The EOC-RPT SYSTEM RESPONSE TIME shall be that time interval from initial signal generation by the associated turbine stop valve limit switch or from when the turbine control valve hydraulic oil control oil pressure drops below the pressure switch setpoint to complete suppression of the electric arc between the fully open contacts of the recirculation pump circuit breaker. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

LEAKAGE

LEAKAGE shall be:

a. Identified LEAKAGE

1. LEAKAGE into the drywell, such as that from pump seals or valve packing, that is captured and conducted to a sump or collecting tank; or
2. LEAKAGE into the drywell atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE;

b. Unidentified LEAKAGE

ALL LEAKAGE into the drywell that is not identified LEAKAGE;

c. Total LEAKAGE

Sum of the identified and unidentified LEAKAGE;

d. Pressure Boundary LEAKAGE

LEAKAGE through a nonisolable fault in a Reactor Coolant System (RCS) component body, pipe wall, or vessel wall.

LINEAR HEAT GENERATION
RATE (LHGR)

The LHGR shall be the heat generation rate per unit length of fuel rod. It is the integral of the heat flux over the heat transfer area associated with the unit length.

(continued)

1.1 Definitions - Insert 1:

DRAIN TIME

The DRAIN TIME is the time it would take for the water inventory in and above the Reactor Pressure Vessel (RPV) to drain to the top of the active fuel (TAF) seated in the RPV assuming:

- a) The water inventory above the TAF is divided by the limiting drain rate;
- b) The limiting drain rate is the larger of the drain rate through a single penetration flow path with the highest flow rate, or the sum of the drain rates through multiple penetration flow paths susceptible to a common mode failure (e.g., seismic event, loss of normal power, single human error), for all penetration flow paths below the TAF except:
 1. Penetration flow paths connected to an intact closed system, or isolated by manual or automatic valves that are locked, sealed, or otherwise secured in the closed position, blank flanges, or other devices that prevent flow of reactor coolant through the penetration flow paths;
 2. Penetration flow paths capable of being isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to the TAF when actuated by RPV water level isolation instrumentation; or
 3. Penetration flow paths with isolation devices that can be closed prior to the RPV water level being equal to the TAF by a dedicated operator trained in the task, who in continuous communication with the control room, is stationed at the controls, and is capable of closing the penetration flow path isolation device without offsite power.
- c) The penetration flow paths required to be evaluated per paragraph b) are assumed to open instantaneously and are not subsequently isolated, and no water is assumed to be subsequently added to the RPV water inventory;
- d) No additional draining events occur; and
- e) Realistic cross-sectional areas and drain rates are used.

A bounding DRAIN TIME may be used in lieu of a calculated value.

3.3 INSTRUMENTATION

3.3.5.1 Emergency Core Cooling System (ECCS) Instrumentation

LCO 3.3.5.1 The ECCS instrumentation for each Function in Table 3.3.5.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5.1-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.5.1-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	<p>B.1</p> <p>-----NOTES-----</p> <p>1. Only applicable in MODES 1, 2, and 3.</p> <p>2. Only applicable for Functions 1.a, 1.b, 2.a, and 2.b.</p> <p>-----</p> <p>Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.</p> <p><u>AND</u></p>	<p>1 hour from discovery of loss of feature initiation capability in both trip systems</p> <p>(continued)</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	<p>B.2 -----NOTE----- Only applicable for Functions 3.a and 3.b. -----</p> <p>Declare High Pressure Coolant Injection (HPCI) System inoperable.</p> <p><u>AND</u></p> <p>B.3 Place channel in trip.</p>	<p>1 hour from discovery of loss of HPCI initiation capability</p> <p>24 hours</p>
C. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	<p>C.1 -----NOTES----- 1. Only applicable in MODES 1, 2, and 3.</p> <p>2- Only applicable for Functions 1.c, 1.e, 1.f, 2.c, 2.d, and 2.f. -----</p> <p>Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.</p> <p><u>AND</u></p> <p>C.2 Restore channel to OPERABLE status.</p>	<p>1 hour from discovery of loss of subsystem initiation capability in both subsystems</p> <p>24 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.</p>	<p>E.1 -----NOTES----- 1. Only applicable in MODES 1, 2, and 3. 2. Only applicable to Functions 1.d and 2.g. ----- Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.</p>	<p>1 hour from discovery of loss of subsystem initiation capability in both subsystems</p>
	<p><u>AND</u> E.2 Restore channel to OPERABLE status.</p>	<p>7 days</p>

(continued)

Table 3.3.5.1-1 (page 1 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	
i. Core Spray System						
a. Reactor Vessel Water Level -Low Low Low (Level 1)	1,2,3; 4(a), 5(a)	4(b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ -160.0 inches	
b. Drywell Pressure -High	1,2,3	4(b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 2.0 psig	
c. Reactor Pressure -Low (Injection Permissive)	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 425.0 psig and ≤ 475.0 psig	
	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 425.0 psig and ≤ 475.0 psig	
d. Core Spray Pump Discharge Flow -Low (Bypass)	1,2,3; 4(a), 5(a)	4 (1 per pump)	E	SR 3.3.5.1.2 SR 3.3.5.1.4	≥ 319.0 psid and ≤ 351.0 psid	
e. Core Spray Pump Start-Time Delay Relay (loss of offsite power)	1,2,3 4(a), 5(a)	4 (1 per pump)	C	SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 5.0 seconds and ≤ 7.0 seconds	
f. Core Spray Pump Start-Time Delay Relay (offsite power available)						
	Pumps A,C	1,2,3 4(a), 5(a)	2 (1 per pump)	C	SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 12.1 seconds and ≤ 13.9 seconds
	Pumps B,D	1,2,3 4(a), 5(a)	2 (1 per pump)	C	SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 21.4 seconds and ≤ 24.6 seconds

Deleted

(continued)

(a) ~~When associated ECCS subsystem(s) are required to be OPERABLE per LCO 3.5.2, ECCS Shutdown.~~

(b) Also required to initiate the associated diesel generator (DG).

Table 3.3.5.1-1 (page 2 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Vessel Water Level—Low Low Low (Level 1)	1,2,3, 4(a), 5(a)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ -160 inches
b. Drywell Pressure—High	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 2.0 psig
c. Reactor Pressure—Low (Injection Permissive)	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 425.0 psig and ≤ 475.0 psig
	4(a), 5(a)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 425.0 psig and ≤ 475.0 psig
d. Reactor Pressure—Low Low (Recirculation Discharge Valve Permissive)	1(c), 2(c), 3(c)	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 211.0 psig
e. Reactor Vessel Shroud Level—Level 0	1,2,3	2	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ -226.0 inches
f. Low Pressure Coolant Injection Pump Start—Time Delay Relay (offsite power available)	1,2,3, 4(a), 5(a)	8 (2 per pump)	C	SR 3.3.5.1.4 SR 3.3.5.1.5	
Pumps A,B					≥ 1.9 seconds and ≤ 2.1 seconds
Pumps C,D					≥ 7.5 seconds and ≤ 8.5 seconds
g. Low Pressure Coolant Injection Pump Discharge Flow—Low (Bypass)	1,2,3 4(a), 5(a)	4 (1 per pump)	E	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 299.0 psid and ≤ 331.0 psid

Deleted

(continued)

- (a) ~~When associated ECCS subsystem(s) are required to be OPERABLE per LCO 3.5.2, ECCS Shutdown.~~
- (c) With associated recirculation pump discharge valve open.

3.3 INSTRUMENTATION

3.3.5.3 Not Used

3.3 INSTRUMENTATION

3.3.5.4 Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation

LCO 3.3.5.4 The RPV Water Inventory Control instrumentation for each Function in Table 3.3.5.4-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5.4-1.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.5.4-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.4-1.	B.1 Declare associated penetration flow path(s) incapable of automatic isolation.	Immediately
	<u>AND</u> B.2 Calculate DRAIN TIME.	Immediately
C. As required by Required Action A.1 and referenced in Table 3.3.5.4-1.	C.1 Place channel in trip.	1 hour
D. As required by Required Action A.1 and referenced in Table 3.3.5.4-1.	D.1 Restore channel to OPERABLE status	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Declare associated low pressure ECCS injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

-----NOTE-----

1. Refer to Table 3.3.5.4-1 to determine which SRs apply for each ECCS Function.
-

SURVEILLANCE	FREQUENCY
SR 3.3.5.4.1 Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.5.4.2 Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.5.4.3 Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program.

(continued)

Table 3.3.5.4-1 (page 1 of 1)
RPV Water Inventory Control Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Pressure—Low (Injection Permissive)	4,5	4	C	SR 3.3.5.4.1 SR 3.3.5.4.2	≥ 425.0 psig and ≤ 475.0 psig
b. Core Spray Pump Discharge Flow—Low (Bypass)	4,5	1 per pump (a)	D	SR 3.3.5.4.1 SR 3.3.5.4.2	≥ 319.0 psid and ≤ 351.0 psid
c. Manual Initiation	4,5	1 per subsystem (a)	D	SR 3.3.5.4.3	NA
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Pressure—Low (Injection Permissive)	4,5	4	C	SR 3.3.5.4.1 SR 3.3.5.4.2	≥ 425.0 psig and ≤ 475.0 psig
b. Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	4,5	1 per pump (a),(c)	D	SR 3.3.5.4.1 SR 3.3.5.4.2	≥ 299.0 psid and ≤ 331.0 psid
c. Manual Initiation	4,5	1 per subsystem (a)	D	SR 3.3.5.4.3	NA
3. RHR System Isolation					
a. Reactor Vessel Water Level - Low, Level 3	(b)	2	B	SR 3.3.5.4.1 SR 3.3.5.4.2	≥ 1.0 inches
4. Reactor Water Cleanup (RWCU) System Isolation					
a. Reactor Vessel Water Level - Low, Level 3	(b)	2	B	SR 3.3.5.4.1 SR 3.3.5.4.2	≥ 1.0 inches

(a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.4, "Reactor Pressure Vessel Water Inventory Control."

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

(c) Function not required to be OPERABLE while associated pump is operating in decay heat removal when minimum flow valve is closed and deactivated.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	H.1 Declare associated standby liquid control (SLC) subsystem inoperable.	1 hour
	<u>OR</u>	
	H.2 Isolate the Reactor Water Cleanup System.	1 hour
I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	I.1 Initiate action to restore channel to OPERABLE status.	Immediately
	<u>OR</u>	
	I.2 Initiate action to isolate the Residual Heat Removal (RHR) Shutdown Cooling System.	Immediately
J. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	J.1 Isolate the affected penetration flow path(s).	24 hours

Primary Containment Isolation Instrumentation
3.3.6.1

Table 3.3.6.1-1 (page 3 of 3)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. Reactor Water Cleanup (RWCU) System Isolation					
a. RWCU Flow-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.7	≤ 125% rated flow (23.0 in-wc)
b. SLC System Initiation	1,2,3	1	H	SR 3.3.6.1.7	NA
c. Reactor Vessel Water Level-Low (Level 3)	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.7	≥ 1.0 inches
6. RHR Shutdown Cooling System Isolation					
a. Reactor Pressure-High	1,2,3	1	F	SR 3.3.6.1.3 SR 3.3.6.1.7	≤ 70.0 psig
b. Reactor Vessel Water Level-Low (Level 3)	3,4,5	2 ¹⁰⁷	I	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.7	≥ 1.0 inches
7. Feedwater Recirculation Isolation					
a. Reactor Pressure-High	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.7	≤ 600 psig
8. Traversing Incore Probe Isolation					
a. Reactor Vessel Water Level-Low (Level 3)	1,2,3	2	J	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.7	≥ 1.0 inches
b. Drywell Pressure-High	1,2,3	2	J	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.7	≤ 2.0 psig

Deleted

(a) ~~In MODES 4 and 5, provided RHR Shutdown Cooling System integrity is maintained, only one channel per trip system with an isolation signal available to one shutdown cooling pump suction isolation valve is required.~~

Secondary Containment Isolation Instrumentation
3.3.6.2

Table 3.3.6.2-1 (page 1 of 1)
Secondary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level-Low (Level 3)	1,2,3, (a)	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.4 SR 3.3.6.2.5	≥ 1.0 inches
2. Drywell Pressure-High	1,2,3	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.4 SR 3.3.6.2.5	≤ 2.0 psig
3. Reactor Building Ventilation Exhaust Radiation-High	1,2,3, (a) ; (b)	2	SR 3.3.6.2.1 SR 3.3.6.2.3 SR 3.3.6.2.5	≤ 16.0 mR/hr
4. Refueling Floor Ventilation Exhaust Radiation-High	1,2,3, (a) ; (b)	2	SR 3.3.6.2.1 SR 3.3.6.2.3 SR 3.3.6.2.5	≤ 16.0 mR/hr

Deleted

- (a) ~~During operations with a potential for draining the reactor vessel.~~
- (b) During movement of RECENTLY IRRADIATED FUEL assemblies in secondary containment.

3.3 INSTRUMENTATION

3.3.7.1 Main Control Room Emergency Ventilation (MCREV) System Instrumentation

LCO 3.3.7.1 Two channels per trip system of the Control Room Air Intake Radiation-High Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of irradiated fuel assemblies in the secondary containment,
During CORE ALTERATIONS,
~~During operations with a potential for draining the reactor vessel (OPDRVs).~~

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Declare associated MCREV subsystems inoperable.	1 hour from discovery of loss of MCREV System initiation capability
	<u>AND</u> A.2 Place channel in trip.	6 hours

(continued)

RPV WATER INVENTORY CONTROL (WIC),

ECCS-Operating
3.5.1

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

3.5.1 ECCS-Operating

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

APPLICABILITY: MODE 1, MODES 2 and 3, except high pressure coolant injection (HPCI) is not required to be OPERABLE with reactor steam dome pressure \leq 150 psig and ADS valves are not required to be OPERABLE with reactor steam dome pressure \leq 100 psig.

ACTIONS

----- NOTE -----
LCO 3.0.4.b is not applicable to HPCI.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One low pressure ECCS injection/spray subsystem inoperable. <u>OR</u> One low pressure coolant injection (LPCI) pump in each subsystem inoperable.	A.1 Restore low pressure ECCS injection/spray subsystem(s) to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3.	12 hours

(continued)

RPV WATER INVENTORY CONTROL (WIC),

ECCS – Shutdown
3.5.2

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

3.5.2 ECCS Shutdown Deleted

LCO 3.5.2 ~~Two low pressure ECCS injection/spray subsystems shall be OPERABLE.~~

~~NOTE~~

~~One LPCI subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable.~~

APPLICABILITY: ~~MODE 4, MODE 5, except with the spent fuel storage pool gates removed, water level \geq 458 inches above reactor pressure vessel instrument zero, and no operations with a potential for draining the reactor vessel (OPDRVs) in progress.~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required ECCS injection/spray subsystem inoperable.	A.1 Restore required ECCS injection/spray subsystem to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action to suspend OPDRVs.	Immediately
C. Two required ECCS injection/spray subsystems inoperable.	C.1 Initiate action to suspend OPDRVs. AND C.2 Restore one ECCS injection/spray subsystem to OPERABLE status.	Immediately 4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action C.2 and associated Completion Time not met.	D.1 Initiate action to restore secondary containment to OPERABLE status.	Immediately
	<u>AND</u>	
	D.2 Initiate action to restore one standby gas treatment subsystem for Unit 2 to OPERABLE status.	Immediately
	<u>AND</u>	
	D.3 Initiate action to restore isolation capability in each required secondary containment penetration flow path not isolated.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.5.2.1 Verify, for each required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is ≥ 11.0 ft.	In accordance with the Surveillance Frequency Control Program.

(continued)

~~SURVEILLANCE REQUIREMENTS (continued)~~

SURVEILLANCE	FREQUENCY
<p>SR 3.5.2.2 Verify, for each required core spray (CS) subsystem, the:</p> <p>a. Suppression pool water level is \geq 11.0 ft; or</p> <p>b. <u>NOTE</u> Only one required CS subsystem may take credit for this option during OPDRVs.</p> <p>Condensate storage tank water level is \geq 17.3 ft.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.2.3 Verify, for each required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.2.4 <u>NOTE</u> Not required to be met for system vent flow paths opened under administrative control.</p> <p>Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>

~~(continued)~~

~~SURVEILLANCE REQUIREMENTS (continued)~~

SURVEILLANCE	FREQUENCY												
<p>SR 3.5.2.5</p> <p style="text-align: center;">NOTE</p> <p>For the CS pumps, SR 3.5.2.5 may be met using equivalent values for flow rate and test pressure determined using pump curves.</p> <p>Verify each required ECCS pump develops the specified flow rate against a system head corresponding to the specified reactor pressure.</p> <table border="1" data-bbox="503 693 1169 913"> <thead> <tr> <th>SYSTEM</th> <th>FLOW RATE</th> <th>NO. OF PUMPS</th> <th>SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF</th> </tr> </thead> <tbody> <tr> <td>CS</td> <td>≥ 3,125 gpm</td> <td>± 1</td> <td>≥ 105 psig</td> </tr> <tr> <td>LPCI</td> <td>≥ 8,600 gpm</td> <td>± 1</td> <td>≥ 20 psig</td> </tr> </tbody> </table>	SYSTEM	FLOW RATE	NO. OF PUMPS	SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF	CS	≥ 3,125 gpm	± 1	≥ 105 psig	LPCI	≥ 8,600 gpm	± 1	≥ 20 psig	<p>In accordance with the Surveillance Frequency Control Program.</p>
SYSTEM	FLOW RATE	NO. OF PUMPS	SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF										
CS	≥ 3,125 gpm	± 1	≥ 105 psig										
LPCI	≥ 8,600 gpm	± 1	≥ 20 psig										
<p>SR 3.5.2.6</p> <p style="text-align: center;">NOTE</p> <p>Vessel injection/spray may be excluded.</p> <p>Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>												

X

RPV WATER INVENTORY CONTROL (WIC)

RCIC System
3.5.3

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

3.5.3 RCIC System

LCO 3.5.3 The RCIC System shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3 with reactor steam dome pressure > 150 psig.

ACTIONS

----- NOTE -----
LCO 3.0.4.b is not applicable to RCIC.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCIC System inoperable.	A.1 Verify by administrative means High Pressure Coolant Injection System is OPERABLE.	Immediately
	<u>AND</u> A.2 Restore RCIC System to OPERABLE status.	14 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours

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

3.5.4 Reactor Pressure Vessel (RPV) Water Inventory Control

LCO 3.5.4 DRAIN TIME of RPV water inventory to the top of active fuel (TAF) shall be \geq 36 hours.

AND

One low pressure ECCS injection/spray subsystem shall be OPERABLE.

-----NOTE-----
 A Low Pressure Coolant Injection (LPCI) subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable.

APPLICABILITY: MODES 4 and 5

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required ECCS injection/spray subsystem inoperable.	A.1 Restore required ECCS injection/spray subsystem to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action to establish a method of water injection capable of operating without offsite electrical power.	Immediately
C. DRAIN TIME < 36 hours and \geq 8 hours.	C.1 Verify secondary containment boundary is capable of being established in less than the DRAIN TIME. <u>AND</u>	4 hours

(continued)

ACTIONS (continued)

<p>D. (continued)</p>	<p>D.4 Initiate action to verify one Standby Gas Treatment subsystem is capable of being placed into operation.</p>	<p>Immediately</p>
<p>E. Required Action and associated Completion Time of Condition C and D not met.</p> <p><u>OR</u></p> <p>DRAIN TIME < 1 hour.</p>	<p>E.1 Initiate action to restore DRAIN TIME to \geq 36 hours.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

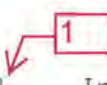
SURVEILLANCE	FREQUENCY
<p>SR 3.5.4.1 Verify DRAIN TIME \geq 36 hours.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.4.2 Verify, for a required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is \geq 11.0 ft.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.4.3 Verify, for a required Core Spray (CS) subsystem, the:</p> <p>a. Suppression pool water level is \geq 11.0 ft. or</p> <p>b. Condensate storage tank water level is \geq 17.3 ft.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.5.4.4 Verify, for each required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.4.5 -----NOTE----- Not required to be met for system vent flow paths open under administrative control. ----- Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.4.6 Operate the required ECCS injection/spray subsystem through the recirculation line for \geq 10 minutes.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.4.7 Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.4.8 -----NOTE----- Vessel injection/spray may be excluded. ----- Verify the required ECCS injection/spray subsystem can be manually actuated.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Purge/Vent flowpath open for an accumulated time greater than 90 hours for the calendar year while in MODE 1 or 2 with Reactor Pressure greater than 100 psig.	E.1 Isolate the penetration.	4 hours
	<u>OR</u>	
	E.2.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	E.2.2 Be in MODE 4.	36 hours
F. Required Action and associated Completion Time of Condition A, B, C, or D not met in MODE 1, 2, or 3.	F.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	F.2 Be in MODE 4.	36 hours
G. Required Action and associated Completion Time of Condition A, B, C, or D not met for PCIV(s) required to be OPERABLE during MODE 4 or 5.	G.1 Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately
	<u>OR</u> 	
	G.2 Initiate action to restore valve(s) to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.3.1 Verify nitrogen inventory is equivalent to ≥ 22 inches water column in the liquid nitrogen storage tank.	In accordance with the Surveillance Frequency Control Program.

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.4.1 Secondary Containment

LCO 3.6.4.1 The secondary containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
 During movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment, ~~+~~
~~During operations with a potential for draining the reactor vessel (OPDRVs).~~ ~~+~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Secondary containment inoperable in MODE 1, 2, or 3.	A.1 Restore secondary containment to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3.	12 hours
C. Secondary containment inoperable during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment or during OPDRVs.	C.1 -----NOTE----- LCO 3.0.3 is not applicable. ----- Suspend movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment. <u>AND</u>	Immediately + (continued) +



ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. (continued)	G.2 Initiate action to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.4.1.1 Verify all secondary containment equipment hatches are closed and sealed.	In accordance with the Surveillance Frequency Control Program.
SR 3.6.4.1.2 Verify one secondary containment access door in each access opening is closed, except when the access opening is being used for entry or exit.	In accordance with the Surveillance Frequency Control Program. †
SR 3.6.4.1.3 Verify secondary containment can be drawn down to ≥ 0.25 inch of vacuum water gauge in ≤ 180 seconds using one standby gas treatment (SGT) subsystem.	In accordance with the Surveillance Frequency Control Program.
SR 3.6.4.1.4 Verify the secondary containment can be maintained ≥ 0.25 inch of vacuum water gauge for 1 hour using one SGT subsystem at a flow rate $\leq 10,500$ cfm.	In accordance with the Surveillance Frequency Control Program.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A or B not met during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment or during OPDRVs.	D.1 -----NOTE----- LCO 3.0.3 is not applicable. ----- Suspend movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment.	Immediately 
	D.2 Initiate action to suspend OPDRVs.	Immediately 

3.6 CONTAINMENT SYSTEMS

3.6.4.3 Standby Gas Treatment (SGT) System

LCO 3.6.4.3 Two SGT subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
 During movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment, +
~~During operations with a potential for draining the reactor vessel (OPDRVs).~~ +

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SGT subsystem inoperable.	A.1 Restore SGT subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, or 3.	B.1 Be in MODE 3.	12 hours
C. Required Action and associated Completion Time of Condition A not met during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment or during OPDRVs.	<p>-----NOTE----- LCO 3.0.3 is not applicable. -----</p> C.1 Place OPERABLE SGT subsystem in operation. OR	Immediately + (continued) +

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME	
C. (continued)	<p>C.2.1 Suspend movement of RECENTLY IRRADIATED FUEL assemblies in secondary containment.</p> <p><u>AND</u></p> <p>C.2.2 Initiate action to suspend OPDRVs.</p>	<p>Immediately</p> <p>Immediately</p>	<p>+</p> <p>+</p> <p>+</p>
D. Two SGT subsystems inoperable in MODE 1, 2, or 3.	D.1 Be in MODE 3.	12 hours	
E. Two SGT subsystems inoperable during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment or during OPDRVs.	<p>E.1 -----NOTE----- LCO 3.0.3 is not applicable. -----</p> <p>Suspend movement of RECENTLY IRRADIATED FUEL assemblies in secondary containment.</p> <p><u>AND</u></p> <p>E.2 Initiate action to suspend OPDRVs.</p>	<p>Immediately</p> <p>Immediately</p>	<p>+</p> <p>+</p> <p>+</p>

3.7 PLANT SYSTEMS

3.7.4 Main Control Room Emergency Ventilation (MCREV) System

LCO 3.7.4 Two MCREV subsystems shall be OPERABLE.

----- NOTE -----
The main control room envelope (CRE) boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, and 3,
During movement of irradiated fuel assemblies in the secondary containment,
During CORE ALTERATIONS,
~~During operations with a potential for draining the reactor vessel (OPDRVs).~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One MCREV subsystem inoperable for reasons other than Condition B.	A.1 Restore MCREV subsystem to OPERABLE status.	7 days
B. One or more MCREV subsystems inoperable due to inoperable CRE boundary in MODE 1, 2 or 3.	B.1 Initiate action to implement mitigating actions.	Immediately
	AND	
	B.2 Verify mitigating actions ensure CRE occupant exposures to radiological/chemical hazards will not exceed limits and mitigating actions for smoke hazards are taken as required.	24 hours
	AND	
	B.3 Restore CRE boundary to OPERABLE status.	90 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME	
<p>C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.</p>	<p>C.1 Be in MODE 3.</p>	<p>12 hours</p>	<p>+ +</p>
<p>D. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.</p>	<p>-----NOTE----- LCO 3.0.3 is not applicable. -----</p> <p>D.1 Place OPERABLE MCREV subsystem in operation.</p> <p><u>OR</u></p> <p>D.2.1 Suspend movement of irradiated fuel assemblies in the secondary containment.</p> <p><u>AND</u></p> <p>D.2.2 Suspend CORE ALTERATIONS.</p> <p><u>AND</u></p> <p>D.2.3 Initiate action to suspend OPDRVs.</p>	<p>Immediately</p> <p>Immediately</p> <p>Immediately</p> <p>Immediately</p>	<p>+ + + + +</p>
<p>E. Two MCREV subsystems inoperable in MODE 1, 2, or 3 for reasons other than Condition B.</p>	<p>E.1 Be in MODE 3.</p>	<p>12 hours</p>	<p>+ +</p>

or



ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>F. Two MCREV subsystems inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.</p> <p>OR</p> <p>One or more MCREV subsystems inoperable due to an inoperable CRE Boundary during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS or during OPDRVs.</p>	<p>-----NOTE----- LCO 3.0.3 is not applicable. -----</p>	
	<p>F.1 Suspend movement of irradiated fuel assemblies in the secondary containment.</p>	Immediately
	<p><u>AND</u></p> <p>F.2 Suspend CORE ALTERATIONS.</p>	Immediately
	<p><u>AND</u></p> <p>F.3 Initiate action to suspend OPDRVs.</p>	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.7.4.1 Operate each MCREV subsystem for ≥ 15 minutes.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.7.4.2 Perform required MCREV filter testing in accordance with the Ventilation Filter Testing Program (VFTP).</p>	<p>In accordance with the VFTP</p>
<p>SR 3.7.4.3 Verify each MCREV subsystem actuates on an actual or simulated initiation signal.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.7.4.4 Perform required CRE unfiltered air leakage testing in accordance with the Control Room Envelope Habitability Program.</p>	<p>In accordance with the Control Room Envelope Habitability Program.</p>

ACTIONS

-----NOTE-----
 LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required offsite circuits inoperable.	-----NOTE----- Enter applicable Condition and Required Actions of LCO 3.8.8, with one or more required 4 kV emergency buses de-energized as a result of Condition A. -----	
	A.1 Declare affected required feature(s), with no offsite power available inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
A.2.2 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately	
<u>AND</u>		
A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel (OPDRVs).	Immediately	
<u>AND</u>		
		(continued)

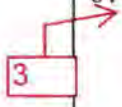
ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	<p>A.2.4 Initiate action to restore required offsite power circuit(s) to OPERABLE status.</p>	Immediately
B. One required DG inoperable.	<p>B.1 Declare affected required feature(s) with no DG available inoperable.</p> <p><u>OR</u></p> <p>B.2.1 Suspend CORE ALTERATIONS</p> <p><u>AND</u></p> <p>B.2.2 Suspend movement of irradiated fuel assemblies in the secondary containment.</p> <p><u>AND</u></p> <p>B.2.3 Initiate action to suspend OPDRVs.</p> <p><u>AND</u></p> <p>B.2.4 Initiate action to restore required DGs to OPERABLE status.</p>	<p>Immediately</p> <p>Immediately</p> <p>Immediately</p> <p>Immediately</p> <p>Immediately</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two or more required DGs inoperable.	C.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	C.2 Suspend movement of irradiated fuel assemblies in secondary containment.	Immediately
	<u>AND</u>	
	C.3 Initiate action to suspend OPDRVs.	Immediately
<u>AND</u>		
C.4 Initiate action to restore required DG(s) to OPERABLE status.	Immediately	



ACTIONS		
CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.2 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	AND	
	A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately
	AND	
	A.2.4 Initiate action to restore required DC electrical power subsystems to OPERABLE status.	Immediately

3

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Distribution Systems—Shutdown

LCO 3.8.8 The necessary portions of the following AC and DC electrical power distribution subsystems shall be OPERABLE:

- a. Unit 2 AC and DC electrical power distribution subsystems needed to support equipment required to be OPERABLE; and
- b. Unit 3 AC and DC electrical power distribution subsystems needed to support equipment required to be OPERABLE by LCO 3.4.8, "Residual Heat Removal (RHR) Shutdown Cooling System—Cold Shutdown," LCO 3.5.2, "~~ECCS Shutdown~~," LCO 3.6.4.3, "Standby Gas Treatment (SGT) System," LCO 3.8.2, "AC Sources—Shutdown," LCO 3.9.7, "RHR—High Water Level," and LCO 3.9.8, "RHR—Low Water Level."

RPV Water Inventory Control

4

APPLICABILITY: MODES 4 and 5,
During movement of irradiated fuel assemblies in the secondary containment.

ACTIONS

NOTE

LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC or DC electrical power distribution subsystems inoperable.	A.1 Declare associated supported required feature(s) inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.2 Suspend handling of irradiated fuel assemblies in the secondary containment.	Immediately
	<u>AND</u>	
	A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately
	<u>AND</u>	
	A.2.4 Initiate actions to restore required AC and DC electrical power distribution subsystems to OPERABLE status.	Immediately
<u>AND</u>		
A.2.5 Declare associated required shutdown cooling subsystem(s) inoperable and not in operation.	Immediately	

3

4

TABLE OF CONTENTS

1.0	USE AND APPLICATION	1.1-1
1.1	Definitions	1.1-1
1.2	Logical Connectors	1.2-1
1.3	Completion Times	1.3-1
1.4	Frequency	1.4-1
2.0	SAFETY LIMITS (SLs)	2.0-1
2.1	SLs	2.0-1
2.2	SL Violations	2.0-1
3.0	LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY	3.0-1
3.0	SURVEILLANCE REQUIREMENT (SR) APPLICABILITY	3.0-4
3.1	REACTIVITY CONTROL SYSTEMS	3.1-1
3.1.1	SHUTDOWN MARGIN (SDM)	3.1-1
3.1.2	Reactivity Anomalies	3.1-5
3.1.3	Control Rod OPERABILITY	3.1-7
3.1.4	Control Rod Scram Times	3.1-12
3.1.5	Control Rod Scram Accumulators	3.1-15
3.1.6	Rod Pattern Control	3.1-18
3.1.7	Standby Liquid Control (SLC) System	3.1-20
3.1.8	Scram Discharge Volume (SDV) Vent and Drain Valves	3.1-26
3.2	POWER DISTRIBUTION LIMITS	3.2-1
3.2.1	AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)	3.2-1
3.2.2	MINIMUM CRITICAL POWER RATIO (MCPR)	3.2-2
3.2.3	LINEAR HEAT GENERATION RATE (LHGR)	3.2-4
3.3	INSTRUMENTATION	3.3-1
3.3.1.1	Reactor Protection System (RPS) Instrumentation	3.3-1
3.3.1.2	Wide Range Neutron Monitor (WRNM) Instrumentation	3.3-10
3.3.2.1	Control Rod Block Instrumentation	3.3-16
3.3.2.2	Feedwater and Main Turbine High Water Level Trip Instrumentation	3.3-22
3.3.3.1	Post Accident Monitoring (PAM) Instrumentation	3.3-24
3.3.3.2	Remote Shutdown System	3.3-27
3.3.4.1	Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation	3.3-29
3.3.4.2	End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation	3.3-31a thru 3.3-31c
3.3.5.1	Emergency Core Cooling System (ECCS) Instrumentation ..	3.3-32
3.3.5.2	Reactor Core Isolation Cooling (RCIC) System Instrumentation	3.3-44
3.3.5.3	Not Used	3.3.47a
3.3.5.4	Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation	3.3.47b
3.3.6.1	Primary Containment Isolation Instrumentation	3.3-48
3.3.6.2	Secondary Containment Isolation Instrumentation	3.3-55
3.3.7.1	Main Control Room Emergency Ventilation (MCREV) System Instrumentation	3.3-59
3.3.8.1	Loss of Power (LOP) Instrumentation	3.3-61
3.3.8.2	Reactor Protection System (RPS) Electric Power Monitoring	3.3-66

(continued)

TABLE OF CONTENTS (continued)

3.4	REACTOR COOLANT SYSTEM (RCS)	3.4-1
3.4.1	Recirculation Loops Operating	3.4-1
3.4.2	Jet Pumps	3.4-6
3.4.3	Safety Relief Valves (SRVs) and Safety Valves (SVs) ...	3.4-8
3.4.4	RCS Operational LEAKAGE	3.4-10
3.4.5	RCS Leakage Detection Instrumentation	3.4-12
3.4.6	RCS Specific Activity	3.4-14
3.4.7	Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown	3.4-16
3.4.8	Residual Heat Removal (RHR) Shutdown Cooling System—Cold Shutdown	3.4-19
3.4.9	RCS Pressure and Temperature (P/T) Limits	3.4-21
3.4.10	Reactor Steam Dome Pressure	3.4-28
3.5	EMERGENCY CORE COOLING SYSTEMS (ECCS), RPV WATER INVENTORY CONTROL (WIC) , AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM	3.5-1
3.5.1	ECCS—Operating	3.5-1
3.5.2	ECCS—Shutdown	3.5-8
3.5.3	RCIC System	3.5-12
3.5.4	RPV Water Inventory Control	3.5-13
3.6	CONTAINMENT SYSTEMS	3.6-1
3.6.1.1	Primary Containment	3.6-1
3.6.1.2	Primary Containment Air Lock	3.6-3
3.6.1.3	Primary Containment Isolation Valves (PCIVs)	3.6-8
3.6.1.4	Drywell Air Temperature	3.6-17
3.6.1.5	Reactor Building-to-Suppression Chamber Vacuum Breakers	3.6-18
3.6.1.6	Suppression Chamber-to-Drywell Vacuum Breakers	3.6-21
3.6.2.1	Suppression Pool Average Temperature	3.6-23
3.6.2.2	Suppression Pool Water Level	3.6-26
3.6.2.3	Residual Heat Removal (RHR) Suppression Pool Cooling	3.6-27
3.6.2.4	Residual Heat Removal (RHR) Suppression Pool Spray ...	3.6-29
3.6.2.5	Residual Heat Removal (RHR) Drywell Spray	3.6-30a
3.6.3.1	Deleted	3.6-31
3.6.3.2	Primary Containment Oxygen Concentration	3.6-33
3.6.4.1	Secondary Containment	3.6-34
3.6.4.2	Secondary Containment Isolation Valves (SCIVs)	3.6-36
3.6.4.3	Standby Gas Treatment (SGT) System	3.6-40
3.7	PLANT SYSTEMS	3.7-1
3.7.1	High Pressure Service Water (HPSW) System	3.7-1
3.7.2	Emergency Service Water (ESW) System and Normal Heat Sink	3.7-3
3.7.3	Emergency Heat Sink	3.7-5
3.7.4	Main Control Room Emergency Ventilation (MCREV) System	3.7-7
3.7.5	Main Condenser Offgas	3.7-10

(continued)

1.1 Definitions (continued)

Insert 1

END OF CYCLE
RECIRCULATION PUMP TRIP
(EOC-RPT) SYSTEM RESPONSE
TIME

The EOC-RPT SYSTEM RESPONSE TIME shall be that time interval from initial signal generation by the associated turbine stop valve limit switch or from when the turbine control valve hydraulic oil control oil pressure drops below the pressure switch setpoint to complete suppression of the electric arc between the fully open contacts of the recirculation pump circuit breaker. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

LEAKAGE

LEAKAGE shall be:

a. Identified LEAKAGE

1. LEAKAGE into the drywell, such as that from pump seals or valve packing, that is captured and conducted to a sump or collecting tank; or
2. LEAKAGE into the drywell atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE;

b. Unidentified LEAKAGE

All LEAKAGE into the drywell that is not identified LEAKAGE;

c. Total LEAKAGE

Sum of the identified and unidentified LEAKAGE;

d. Pressure Boundary LEAKAGE

LEAKAGE through a nonisolable fault in a Reactor Coolant System (RCS) component body, pipe wall, or vessel wall.

LINEAR HEAT GENERATION
RATE (LHGR)

The LHGR shall be the heat generation rate per unit length of fuel rod. It is the integral of the heat flux over the heat transfer area associated with the unit length.

(continued)

1.1 Definitions - Insert 1:

DRAIN TIME

The DRAIN TIME is the time it would take for the water inventory in and above the Reactor Pressure Vessel (RPV) to drain to the top of the active fuel (TAF) seated in the RPV assuming:

- a) The water inventory above the TAF is divided by the limiting drain rate;
- b) The limiting drain rate is the larger of the drain rate through a single penetration flow path with the highest flow rate, or the sum of the drain rates through multiple penetration flow paths susceptible to a common mode failure (e.g., seismic event, loss of normal power, single human error), for all penetration flow paths below the TAF except:
 1. Penetration flow paths connected to an intact closed system, or isolated by manual or automatic valves that are locked, sealed, or otherwise secured in the closed position, blank flanges, or other devices that prevent flow of reactor coolant through the penetration flow paths;
 2. Penetration flow paths capable of being isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to the TAF when actuated by RPV water level isolation instrumentation; or
 3. Penetration flow paths with isolation devices that can be closed prior to the RPV water level being equal to the TAF by a dedicated operator trained in the task, who in continuous communication with the control room, is stationed at the controls, and is capable of closing the penetration flow path isolation device without offsite power.
- c) The penetration flow paths required to be evaluated per paragraph b) are assumed to open instantaneously and are not subsequently isolated, and no water is assumed to be subsequently added to the RPV water inventory;
- d) No additional draining events occur; and
- e) Realistic cross-sectional areas and drain rates are used.

A bounding DRAIN TIME may be used in lieu of a calculated value.

3.3 INSTRUMENTATION

3.3.5.1 Emergency Core Cooling System (ECCS) Instrumentation

LCO 3.3.5.1 The ECCS instrumentation for each Function in Table 3.3.5.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5.1-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.5.1-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	<p>B.1 -----NOTES----- 1. Only applicable in MODES 1, 2, and 3. 2. Only applicable for Functions 1.a, 1.b, 2.a, and 2.b.</p> <p>-----</p> <p>Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.</p> <p><u>AND</u></p>	<p>1 hour from discovery of loss of feature initiation capability in both trip systems</p> <p>(continued)</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	<p>B.2 -----NOTE----- Only applicable for Functions 3.a and 3.b. -----</p> <p>Declare High Pressure Coolant Injection (HPCI) System inoperable.</p> <p><u>AND</u></p> <p>B.3 Place channel in trip.</p>	<p>1 hour from discovery of loss of HPCI initiation capability</p> <p>24 hours</p>
C. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	<p>C.1 -----NOTES----- 1. Only applicable in MODES 1, 2, and 3. 2. Only applicable for Functions 1.c, 1.e, 1.f, 2.c, 2.d, and 2.f. -----</p> <p>Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.</p> <p><u>AND</u></p> <p>C.2 Restore channel to OPERABLE status.</p>	<p>1 hour from discovery of loss of subsystem initiation capability in both subsystems</p> <p>24 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.</p>	<p>E.1 -----NOTES----- 1. Only applicable in MODES 1, 2, and 3. 2- Only applicable to Functions 1.d and 2.g. ----- Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.</p>	<p>1 hour from discovery of loss of subsystem initiation capability in both subsystems</p>
	<p><u>AND</u> E.2 Restore channel to OPERABLE status.</p>	<p>7 days</p>

(continued)

Table 3.3.5.1-1 (page 1 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	
1. Core Spray System						
a. Reactor Vessel Water Level—Low Low Low (Level 1)	1,2,3 4(a), 5(a)	4(b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ -160.0 inches	
b. Drywell Pressure—High	1,2,3	4(b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 2.0 psig	
c. Reactor Pressure—Low (Injection Permissive)	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 425.0 psig and ≤ 475.0 psig	
	4(a), 5(a)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 425.0 psig and ≤ 475.0 psig	
d. Core Spray Pump Discharge Flow—Low (Bypass)	1,2,3 4(a), 5(a)	4 (1 per pump)	E	SR 3.3.5.1.2 SR 3.3.5.1.4	≥ 319.0 psid and ≤ 351.0 psid	
e. Core Spray Pump Start-Time Delay Relay (loss of offsite power)	1,2,3 4(a), 5(a)	4 (1 per pump)	C	SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 5.0 seconds and ≤ 7.0 seconds	
f. Core Spray Pump Start-Time Delay Relay (offsite power available)						
	Pumps A,C	1,2,3 4(a), 5(a)	2 (1 per pump)	C	SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 12.1 seconds and ≤ 13.9 seconds
	Pumps B,D	1,2,3 4(a), 5(a)	2 (1 per pump)	C	SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 21.4 seconds and ≤ 24.6 seconds

Deleted

(continued)

(a) ~~When associated ECCS subsystems are required to be OPERABLE per LCO 3.5.2, ECCS Shutdown.~~

(b) Also required to initiate the associated diesel generator (DG).

Table 3.3.5.1-1 (page 2 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Vessel Water Level—Low Low Low (Level 1)	1,2,3 4(a), 5(a)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ -160 inches
b. Drywell Pressure—High	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 2.0 psig
c. Reactor Pressure—Low (Injection Permissive)	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 425.0 psig and ≤ 475.0 psig
	4(a), 5(a)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 425.0 psig and ≤ 475.0 psig
d. Reactor Pressure—Low Low (Recirculation Discharge Valve Permissive)	1(c), 2(c), 3(c)	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 211.0 psig
e. Reactor Vessel Shroud Level—Level 0	1,2,3	2	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ -226.0 inches
f. Low Pressure Coolant Injection Pump Start—Time Delay Relay (offsite power available)	1,2,3 4(a), 5(a)	8 (2 per pump)	C	SR 3.3.5.1.4 SR 3.3.5.1.5	
	Pumps A,B				≥ 1.9 seconds and ≤ 2.1 seconds
	Pumps C,D				≥ 7.5 seconds and ≤ 8.5 seconds
g. Low Pressure Coolant Injection Pump Discharge Flow—Low (Bypass)	1,2,3 4(a), 5(a)	4 (1 per pump)	E	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 299.0 psid and ≤ 331.0 psid

Deleted

(continued)

- (a) When associated ECCS subsystem(s) are required to be OPERABLE per LCO 3.5.2, ECCS Shutdown.
- (c) With associated recirculation pump discharge valve open.

3.3 INSTRUMENTATION

3.3.5.3 Not Used

3.3 INSTRUMENTATION

3.3.5.4 Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation

LCO 3.3.5.4 The RPV Water Inventory Control instrumentation for each Function in Table 3.3.5.4-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5.4-1.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.5.4-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.4-1.	B.1 Declare associated penetration flow path(s) incapable of automatic isolation.	Immediately
	<u>AND</u> B.2 Calculate DRAIN TIME.	Immediately
C. As required by Required Action A.1 and referenced in Table 3.3.5.4-1.	C.1 Place channel in trip.	1 hour
D. As required by Required Action A.1 and referenced in Table 3.3.5.4-1.	D.1 Restore channel to OPERABLE status	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Declare associated low pressure ECCS injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

-----NOTE-----

1. Refer to Table 3.3.5.4-1 to determine which SRs apply for each ECCS Function.

SURVEILLANCE	FREQUENCY
SR 3.3.5.4.1 Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.5.4.2 Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.5.4.3 Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program.

(continued)

Table 3.3.5.4-1 (page 1 of 1)
RPV Water Inventory Control Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Pressure—Low (Injection Permissive)	4,5	4	C	SR 3.3.5.4.1 SR 3.3.5.4.2	≥ 425.0 psig and ≤ 475.0 psig
b. Core Spray Pump Discharge Flow—Low (Bypass)	4,5	1 per pump (a)	D	SR 3.3.5.4.1 SR 3.3.5.4.2	≥ 319.0 psid and ≤ 351.0 psid
c. Manual Initiation	4,5	1 per subsystem (a)	D	SR 3.3.5.4.3	NA
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Pressure—Low (Injection Permissive)	4,5	4	C	SR 3.3.5.4.1 SR 3.3.5.4.2	≥ 425.0 psig and ≤ 475.0 psig
b. Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	4,5	1 per pump (a),(c)	D	SR 3.3.5.4.1 SR 3.3.5.4.2	≥ 299.0 psid and ≤ 331.0 psid
c. Manual Initiation	4,5	1 per subsystem (a)	D	SR 3.3.5.4.3	NA
3. RHR System Isolation					
a. Reactor Vessel Water Level - Low, Level 3	(b)	2	B	SR 3.3.5.4.1 SR 3.3.5.4.2	≥ 1.0 inches
4. Reactor Water Cleanup (RWCU) System Isolation					
a. Reactor Vessel Water Level - Low, Level 3	(b)	2	B	SR 3.3.5.4.1 SR 3.3.5.4.2	≥ 1.0 inches

(a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.4, "Reactor Pressure Vessel Water Inventory Control."

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

(c) Function not required to be OPERABLE while associated pump is operating in decay heat removal when minimum flow valve is closed and deactivated.

Primary Containment Isolation Instrumentation
3.3.6.1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	H.1 Declare associated standby liquid control (SLC) subsystem inoperable.	1 hour
	<u>OR</u>	
	H.2 Isolate the Reactor Water Cleanup System.	1 hour
I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	I.1 Initiate action to restore channel to OPERABLE status.	Immediately
	<u>OR</u>	
	I.2 Initiate action to isolate the Residual Heat Removal (RHR) Shutdown Cooling System.	Immediately
J. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	J.1 Isolate the affected penetration flow path(s).	24 hours

Primary Containment Isolation Instrumentation
3.3.6.1

Table 3.3.6.1-1 (page 3 of 3)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. Reactor Water Cleanup (RWCU) System Isolation					
a. RWCU Flow-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.7	≤ 125% rated flow (23.0 in-wc)
b. SLC System Initiation	1,2,3	1	H	SR 3.3.6.1.7	NA
c. Reactor Vessel Water Level-Low (Level 3)	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.7	≥ 1.0 inches
6. RHR Shutdown Cooling System Isolation					
a. Reactor Pressure-High	1,2,3	1	F	SR 3.3.6.1.3 SR 3.3.6.1.7	≤ 70.0 psig
b. Reactor Vessel Water Level-Low (Level 3)	3,4,5	2	I	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.7	≥ 1.0 inches
7. Feedwater Recirculation Isolation					
a. Reactor Pressure-High	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.7	≤ 600 psig
8. Traversing Incore Probe Isolation					
a. Reactor Vessel Water Level-Low (Level 3)	1,2,3	2	I	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.7	≥ 1.0 inches
b. Drywell Pressure-High	1,2,3	2	I	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.7	≤ 2.0 psig

Deleted

(a) ~~In MODES 4 and 5, provided RHR Shutdown Cooling System integrity is maintained, only one channel per trip system with an isolation signal available to one shutdown cooling pump suction isolation valve is required.~~

Secondary Containment Isolation Instrumentation
3.3.6.2

Table 3.3.6.2-1 (page 1 of 1)
Secondary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level—Low (Level 3)	1,2,3 (a)	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.4 SR 3.3.6.2.5	≥ 1.0 inches
2. Drywell Pressure—High	1,2,3	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.4 SR 3.3.6.2.5	≤ 2.0 psig
3. Reactor Building Ventilation Exhaust Radiation—High	1,2,3, (a) , (b)	2	SR 3.3.6.2.1 SR 3.3.6.2.3 SR 3.3.6.2.5	≤ 16.0 mR/hr
Deleted Refueling Floor Ventilation Exhaust Radiation—High	1,2,3, (a) , (b)	2	SR 3.3.6.2.1 SR 3.3.6.2.3 SR 3.3.6.2.5	≤ 16.0 mR/hr

(a) ~~During operations with a potential for draining the reactor vessel.~~

(b) ~~During movement of RECENTLY IRRADIATED FUEL assemblies in secondary containment.~~

3.3 INSTRUMENTATION

3.3.7.1 Main Control Room Emergency Ventilation (MCREV) System Instrumentation

LCO 3.3.7.1 Two channels per trip system of the Control Room Air Intake Radiation-High Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
 During movement of irradiated fuel assemblies in the secondary containment,
 During CORE ALTERATIONS,
~~During operations with a potential for draining the reactor vessel (OPDRVs).~~

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Declare associated MCREV subsystems inoperable.	1 hour from discovery of loss of MCREV System initiation capability
	<u>AND</u>	
	A.2 Place channel in trip.	6 hours

(continued)

RPV WATER INVENTORY CONTROL (WIC),

ECCS-Operating
3.5.1

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

3.5.1 ECCS-Operating

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

APPLICABILITY: MODE 1, MODES 2 and 3, except high pressure coolant injection (HPCI) is not required to be OPERABLE with reactor steam dome pressure ≤ 150 psig and ADS valves are not required to be OPERABLE with reactor steam dome pressure ≤ 100 psig.

ACTIONS

----- NOTE -----
LCO 3.0.4.b is not applicable to HPCI.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One low pressure ECCS injection/spray subsystem inoperable. <u>OR</u> One low pressure coolant injection (LPCI) pump in each subsystem inoperable.	A.1 Restore low pressure ECCS injection/spray subsystem(s) to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3.	12 hours

(continued)

, RPV WATER INVENTORY CONTROL (WIC),

ECCS – Shutdown
3.5.2

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

3.5.2 ~~ECCS Shutdown~~ Deleted

~~LCO 3.5.2 Two low pressure ECCS injection/spray subsystems shall be OPERABLE.~~

NOTE

~~One LPCI subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable.~~

APPLICABILITY: ~~MODE 4, MODE 5, except with the spent fuel storage pool gates removed, water level \geq 458 inches above reactor pressure vessel instrument zero, and no operations with a potential for draining the reactor vessel (OPDRVs) in progress.~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required ECCS injection/spray subsystem inoperable.	A.1 Restore required ECCS injection/spray subsystem to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action to suspend OPDRVs.	Immediately
C. Two required ECCS injection/spray subsystems inoperable.	C.1 Initiate action to suspend OPDRVs. AND C.2 Restore one ECCS injection/spray subsystem to OPERABLE status.	Immediately 4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action C.2 and associated Completion Time not met.	D.1 Initiate action to restore secondary containment to OPERABLE status.	Immediately
	AND	
	D.2 Initiate action to restore one standby gas treatment subsystem for Unit 3 to OPERABLE status.	Immediately
	AND	
	D.3 Initiate action to restore isolation capability in each required secondary containment penetration flow path not isolated.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.5.2.1 Verify, for each required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is \geq 11.0 ft.	In accordance with the Surveillance Frequency Control Program.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.5.2.2 Verify, for each required core spray (CS) subsystem, the:</p> <p>a. Suppression pool water level is ≥ 11.0 ft; or</p> <p>b. NOTE Only one required CS subsystem may take credit for this option during OPDRVs.</p> <p>Condensate storage tank water level is ≥ 17.3 ft.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.2.3 Verify, for each required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.2.4 NOTE Not required to be met for system vent flow paths opened under administrative control.</p> <p>Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>

(continued)

~~SURVEILLANCE REQUIREMENTS (continued)~~

SURVEILLANCE		FREQUENCY												
SR 3.5.2.5	<p>NOTE</p> <p>For the CS pumps, SR 3.5.2.5 may be met using equivalent values for flow rate and test pressure determined using pump curves.</p> <p>Verify each required ECCS pump develops the specified flow rate against a system head corresponding to the specified reactor pressure.</p> <table border="1"> <thead> <tr> <th>SYSTEM</th> <th>FLOW RATE</th> <th>NO. OF PUMPS</th> <th>SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF</th> </tr> </thead> <tbody> <tr> <td>CS</td> <td>≥ 3,125 gpm</td> <td>±</td> <td>≥ 105 psig</td> </tr> <tr> <td>LPCI</td> <td>≥ 8,600 gpm</td> <td>±</td> <td>≥ 20 psig</td> </tr> </tbody> </table>	SYSTEM	FLOW RATE	NO. OF PUMPS	SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF	CS	≥ 3,125 gpm	±	≥ 105 psig	LPCI	≥ 8,600 gpm	±	≥ 20 psig	<p>In accordance with the Surveillance Frequency Control Program.</p>
	SYSTEM	FLOW RATE	NO. OF PUMPS	SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF										
CS	≥ 3,125 gpm	±	≥ 105 psig											
LPCI	≥ 8,600 gpm	±	≥ 20 psig											
SR 3.5.2.6	<p>NOTE</p> <p>Vessel injection/spray may be excluded.</p> <p>Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>												

RPV WATER INVENTORY CONTROL (WIC),

RCIC System
3.5.3

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

3.5.3 RCIC System

LCO 3.5.3 The RCIC System shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3 with reactor steam dome pressure > 150 psig.

ACTIONS

----- NOTE -----
LCO 3.0.4.b is not applicable to RCIC.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCIC System inoperable.	A.1 Verify by administrative means High Pressure Coolant Injection System is OPERABLE.	Immediately
	<u>AND</u> A.2 Restore RCIC System to OPERABLE status.	14 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours

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

3.5.4 Reactor Pressure Vessel (RPV) Water Inventory Control

LCO 3.5.4 DRAIN TIME of RPV water inventory to the top of active fuel (TAF) shall be \geq 36 hours.

AND

One low pressure ECCS injection/spray subsystem shall be OPERABLE.

-----NOTE-----

A Low Pressure Coolant Injection (LPCI) subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable.

APPLICABILITY: MODES 4 and 5

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required ECCS injection/spray subsystem inoperable.	A.1 Restore required ECCS injection/spray subsystem to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action to establish a method of water injection capable of operating without offsite electrical power.	Immediately
C. DRAIN TIME < 36 hours and \geq 8 hours.	C.1 Verify secondary containment boundary is capable of being established in less than the DRAIN TIME. <u>AND</u>	4 hours

(continued)

ACTIONS (continued)

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

(continued)

ACTIONS (continued)

<p>D. (continued)</p>	<p>D.4 Initiate action to verify one Standby Gas Treatment subsystem is capable of being placed into operation.</p>	<p>Immediately</p>
<p>E. Required Action and associated Completion Time of Condition C and D not met.</p> <p><u>OR</u></p> <p>DRAIN TIME < 1 hour.</p>	<p>E.1 Initiate action to restore DRAIN TIME to \geq 36 hours.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.5.4.1 Verify DRAIN TIME \geq 36 hours.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.4.2 Verify, for a required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is \geq 11.0 ft.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.4.3 Verify, for a required Core Spray (CS) subsystem, the:</p> <p>a. Suppression pool water level is \geq 11.0 ft. or</p> <p>b. Condensate storage tank water level is \geq 17.3 ft.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.5.4.4 Verify, for each required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.4.5 -----NOTE----- Not required to be met for system vent flow paths open under administrative control. ----- Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.4.6 Operate the required ECCS injection/spray subsystem through the recirculation line for \geq 10 minutes.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.4.7 Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>
<p>SR 3.5.4.8 -----NOTE----- Vessel injection/spray may be excluded. ----- Verify the required ECCS injection/spray subsystem can be manually actuated.</p>	<p>In accordance with the Surveillance Frequency Control Program.</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Purge/Vent flowpath open for an accumulated time greater than 90 hours for the calendar year while in MODE 1 or 2 with Reactor Pressure greater than 100 psig.	E.1 Isolate the penetration.	4 hours
	<u>OR</u>	
	E.2.1 Be in MODE 3. <u>AND</u> E.2.2 Be in Mode 4.	12 hours 36 hours
F. Required Action and associated Completion Time of Condition A, B, C, or D not met in MODE 1, 2, or 3.	F.1 Be in MODE 3. <u>AND</u>	12 hours
	F.2 Be in MODE 4.	36 hours
G. Required Action and associated Completion Time of Condition A, B, C, or D not met for PCIV(s) required to be OPERABLE during MODE 4 or 5.	G.1 Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately
	<u>OR</u> 1 G.2 ← Initiate action to restore valve(s) to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.3.1 Verify nitrogen inventory is equivalent to ≥ 22 inches water column in the liquid nitrogen storage tank.	In accordance with the Surveillance Frequency Control Program.

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.4.1 Secondary Containment

LCO 3.6.4.1 The secondary containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
 During movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment, ✕
~~During operations with a potential for draining the reactor vessel (OPDRVs).~~ ✕


ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Secondary containment inoperable in MODE 1, 2, or 3.	A.1 Restore secondary containment to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3.	12 hours
C. Secondary containment inoperable during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment or during OPDRVs.	C.1 -----NOTE----- LCO 3.0.3 is not applicable. ----- Suspend movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment. <u>AND</u>	Immediately ✕ ✕ (continued)

~~ACTIONS~~

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. (continued)	E.2 Initiate action to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.4.1.1 Verify all secondary containment equipment hatches are closed and sealed.	In accordance with the Surveillance Frequency Control Program.
SR 3.6.4.1.2 Verify one secondary containment access door in each access opening is closed, except when the access opening is being used for entry or exit.	In accordance with the Surveillance Frequency Control Program. 
SR 3.6.4.1.3 Verify secondary containment can be drawn down to ≥ 0.25 inch of vacuum water gauge in ≤ 180 seconds using one standby gas treatment (SGT) subsystem.	In accordance with the Surveillance Frequency Control Program.
SR 3.6.4.1.4 Verify the secondary containment can be maintained ≥ 0.25 inch of vacuum water gauge for 1 hour using one SGT subsystem at a flow rate $\leq 10,500$ cfm.	In accordance with the Surveillance Frequency Control Program.

3.6 CONTAINMENT SYSTEMS

3.6.4.2 Secondary Containment Isolation Valves (SCIVs)

LCO 3.6.4.2 Each SCIV shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
 During movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment, ~~During operations with a potential for draining the reactor vessel (OPDRVs).~~

ACTIONS

NOTES

1. Penetration flow paths may be unisolated intermittently under administrative controls.
2. Separate Condition entry is allowed for each penetration flow path.
3. Enter applicable Conditions and Required Actions for systems made inoperable by SCIVs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more penetration flow paths with one SCIV inoperable.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	8 hours
	<u>AND</u>	(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A or B not met during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment or during OPDRVs.	D.1 -----NOTE----- LCO 3.0.3 is not applicable. ----- Suspend movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment.	Immediately
	AND D.2 Initiate action to suspend OPDRVs.	Immediately

3.6 CONTAINMENT SYSTEMS

3.6.4.3 Standby Gas Treatment (SGT) System

LCO 3.6.4.3 Two SGT subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
 During movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment, ✕
~~During operations with a potential for draining the reactor vessel (OPDRVs).~~ ✕

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SGT subsystem inoperable.	A.1 Restore SGT subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, or 3.	B.1 Be in MODE 3.	12 hours
C. Required Action and associated Completion Time of Condition A not met during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment or during OPDRVs.	<p>-----NOTE----- LCO 3.0.3 is not applicable. -----</p> <p>C.1 Place OPERABLE SGT subsystem in operation.</p> <p><u>OR</u></p>	<p>Immediately ✕</p> <p>✕</p> <p>(continued)</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	<p>C.2.1 Suspend movement of RECENTLY IRRADIATED FUEL assemblies in secondary containment.</p> <p><u>AND</u></p> <p>C.2.2 Initiate action to suspend OPDRVs.</p>	<p>Immediately</p> <p>Immediately</p>
D. Two SGT subsystems inoperable in MODE 1, 2, or 3.	D.1 Be in MODE 3.	12 hours
E. Two SGT subsystems inoperable during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment or during OPDRVs.	<p>E.1 -----NOTE----- LCO 3.0.3 is not applicable. -----</p> <p>Suspend movement of RECENTLY IRRADIATED FUEL assemblies in secondary containment.</p> <p><u>AND</u></p> <p>E.2 Initiate action to suspend OPDRVs.</p>	<p>Immediately</p> <p>Immediately</p>

3.7 PLANT SYSTEMS

3.7.4 Main Control Room Emergency Ventilation (MCREV) System

LCO 3.7.4 Two MCREV subsystems shall be OPERABLE.

----- NOTE -----
The main control room envelope (CRE) boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, and 3,
During movement of irradiated fuel assemblies in the secondary containment,
During CORE ALTERATIONS,
~~During operations with a potential for draining the reactor vessel (OPDRVs).~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One MCREV subsystem inoperable for reasons other than Condition B.	A.1 Restore MCREV subsystem to OPERABLE status.	7 days
B. One or more MCREV subsystems inoperable due to inoperable CRE boundary in MODE 1, 2 or 3.	B.1 Initiate action to implement mitigating actions.	Immediately
	AND	
	B.2 Verify mitigating actions ensure CRE occupant exposures to radiological/chemical hazards will not exceed limits and mitigating actions for smoke hazards are taken as required.	24 hours
	AND	
	B.3 Restore CRE boundary to OPERABLE status.	90 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME	
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 Be in MODE 3.	12 hours	+ /
D. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	<p>-----NOTE----- LCO 3.0.3 is not applicable. -----</p> <p>D.1 Place OPERABLE MCREV subsystem in operation.</p> <p><u>OR</u></p> <p>D.2.1 Suspend movement of irradiated fuel assemblies in the secondary containment.</p> <p><u>AND</u></p> <p>D.2.2 Suspend CORE ALTERATIONS.</p> <p><u>AND</u></p> <p>D.2.3 Initiate action to suspend OPDRVs.</p>	<p>Immediately</p> <p>Immediately</p> <p>Immediately</p> <p>Immediately</p>	<p>+ /</p> <p>+ /</p> <p>+ /</p> <p>+ /</p>
E. Two MCREV subsystems inoperable in MODE 1, 2, or 3 for reasons other than Condition B.	E.1 Be in MODE 3.	12 hours	 /

or

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>F. Two MCREV subsystems inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.</p> <p>or →</p> <p>OR</p> <p>One or more MCREV subsystems inoperable due to an inoperable CRE boundary during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS or during OPDRVs.</p> <p>or →</p>	<p>-----NOTE----- LCO 3.0.3 is not applicable. -----</p>	
	<p>F.1 Suspend movement of irradiated fuel assemblies in the secondary containment.</p>	Immediately
	<p><u>AND</u></p> <p>F.2 Suspend CORE ALTERATIONS.</p>	Immediately
	<p><u>AND</u></p> <p>F.3 Initiate action to suspend OPDRVs.</p>	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Operate each MCREV subsystem for ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.4.2	Perform required MCREV filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.4.3	Verify each MCREV subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.4.4	Perform required CRE unfiltered air leakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program.

ACTIONS


-----NOTE-----
 LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required offsite circuits inoperable.	-----NOTE----- Enter applicable Condition and Required Actions of LCO 3.8.8, with one or more required 4 kV emergency buses de-energized as a result of Condition A. -----	
	A.1 Declare affected required feature(s), with no offsite power available inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
A.2.2 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately	
<u>AND</u>		
A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel (OPDRVs).	Immediately	
<u>AND</u>		
		(continued)

ACTIONS		
CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 <div style="display: inline-block; vertical-align: middle; text-align: center;"> 3 ↑ </div> Initiate action to restore required offsite power circuit(s) to OPERABLE status.	Immediately
B. One required DG inoperable.	B.1 Declare affected required feature(s) with no DG available inoperable.	Immediately
	<u>OR</u>	
	B.2.1 Suspend CORE ALTERATIONS	Immediately
	<u>AND</u>	
	B.2.2 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	<u>AND</u>	
	B.2.3 Initiate action to suspend OPDRVs.	Immediately
	<u>AND</u>	
	B.2.4 <div style="display: inline-block; vertical-align: middle; text-align: center;"> 3 ↑ </div> Initiate action to restore required DGs to OPERABLE status.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two or more required DGs inoperable.	C.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	C.2 Suspend movement of irradiated fuel assemblies in secondary containment.	Immediately
	<u>AND</u>	
	C.3 Initiate action to suspend OPDRVs.	Immediately
	<u>AND</u>	
	C.4 Initiate action to restore required DG(s) to OPERABLE status.	Immediately
		

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. (continued)</p>	<p>A.2.2 Suspend movement of irradiated fuel assemblies in the secondary containment.</p>	<p>Immediately</p>
	<p><u>AND</u></p> <p>A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel.</p>	<p>Immediately</p>
	<p><u>AND</u></p> <p>A.2.4 Initiate action to restore required DC electrical power subsystems to OPERABLE status.</p>	<p>Immediately</p>

3

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Distribution Systems – Shutdown

LCO 3.8.8 The necessary portions of the following AC and DC electrical power distribution subsystems shall be OPERABLE:

- a. Unit 3 AC and DC electrical power distribution subsystems needed to support equipment required to be OPERABLE; and
- b. Unit 2 AC and DC electrical power distribution subsystems needed to support equipment required to OPERABLE by LCO 3.4.8, "Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown," LCO 3.5.2, "~~ECCS Shutdown~~," LCO 3.6.4.3, "Standby Gas Treatment (SGT) System," LCO 3.7.4, "Main Control Room Emergency Ventilation (MCREV) System," LCO 3.8.2, "AC Sources – Shutdown," LCO 3.9.7, "RHR – High Water Level," and LCO 3.9.8, "RHR – Low Water Level."

RPV Water
Control
Inventory

4

APPLICABILITY: MODES 4 and 5,
During movement of irradiated fuel assemblies in the secondary containment.

ACTIONS

NOTE

LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC or DC electrical power distribution subsystems inoperable.	A.1 Declare associated supported required feature(s) inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.2 Suspend handling of irradiated fuel assemblies in the secondary containment.	Immediately
	<u>AND</u>	
	A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately
	<u>AND</u>	
	A.2.4 Initiate actions to restore required AC and DC electrical power distribution subsystems to OPERABLE status.	Immediately
<u>AND</u>		
A.2.5 Declare associated required shutdown cooling subsystem(s) inoperable and not in operation.	Immediately	

3

4

ATTACHMENT 3

Markup of Technical Specifications Bases Pages (For Information Only)

Peach Bottom Atomic Power Station Units 2 and 3

Renewed Facility Operating License Nos. DPR-44 and DPR-56

Docket Nos. 50-277 and 50-278

Revised Technical Specifications Bases Pages

<u>Unit 2 TS Bases Page</u>				
i	B 3.3-140e*	B 3.5-19b	B 3.6-18	B 3.8-44
ii	B 3.3-140f*	B 3.5-20	B 3.6-23a	B 3.8-45
B 3.3-99	B 3.3-140g*	B 3.5-21	B 3.6-54	B 3.8-46
B 3.3-101	B 3.3-140h*	B 3.5-22	B 3.6-74	B 3.8-72
B 3.3-102	B 3.3-140i*	B 3.5-23	B 3.6-75	B 3.8-73
B 3.3-103	B 3.3-140j*	B 3.5-24	B 3.6-79	B 3.8-74
B 3.3-104	B 3.3-158	B 3.5-25	B 3.6-82	B 3.8-75
B 3.3-106	B 3.3-159	B 3.5-31*	B 3.6-87	B 3.8-94
B 3.3-117	B 3.3-172	B 3.5-32*	B 3.6-88	B 3.8-95
B 3.3-118	B 3.3-174	B 3.5-33*	B 3.6-89	B 3.8-96
B 3.3-120	B 3.3-182	B 3.5-34*	B 3.7-17	B 3.8-97
B 3.3-122	B 3.5-1	B 3.5-35*	B 3.7-19	B 3.10-2a
B 3.3-140a*	B 3.5-6	B 3.5-36*	B 3.7-20	
B 3.3-140b*	B 3.5-18	B 3.5-37*	B 3.8-40	
B 3.3-140c*	B 3.5-19	B 3.5-38*	B 3.8-42	
B 3.3-140d*	B 3.5-19a	B 3.5-39*	B 3.8-43	

<u>Unit 3 TS Bases Page</u>				
i	B 3.3-141e*	B 3.5-19b	B 3.6-18	B 3.8-44
ii	B 3.3-141f*	B 3.5-20	B 3.6-23a	B 3.8-45
B 3.3-100	B 3.3-141g*	B 3.5-21	B 3.6-54	B 3.8-46
B 3.3-102	B 3.3-141h*	B 3.5-22	B 3.6-74	B 3.8-72
B 3.3-103	B 3.3-141i*	B 3.5-23	B 3.6-75	B 3.8-73
B 3.3-104	B 3.3-141j*	B 3.5-24	B 3.6-79	B 3.8-74
B 3.3-105	B 3.3-159	B 3.5-25	B 3.6-82	B 3.8-75
B 3.3-107	B 3.3-160	B 3.5-31*	B 3.6-87	B 3.8-94
B 3.3-118	B 3.3-172	B 3.5-32*	B 3.6-88	B 3.8-95
B 3.3-119	B 3.3-174	B 3.5-33*	B 3.6-89	B 3.8-96
B 3.3-121	B 3.3-182	B 3.5-34*	B 3.7-17	B 3.8-97
B 3.3-123	B 3.5-1	B 3.5-35*	B 3.7-19	B 3.10-2a
B 3.3-141a*	B 3.5-6	B 3.5-36*	B 3.7-20	
B 3.3-141b*	B 3.5-18	B 3.5-37*	B 3.8-40	
B 3.3-141c*	B 3.5-19	B 3.5-38*	B 3.8-42	
B 3.3-141d*	B 3.5-19a	B 3.5-39*	B 3.8-43	

*New TS Bases Page

TABLE OF CONTENTS

B 2.0	SAFETY LIMITS (SLs)	B 2.0-1
B 2.1.1	Reactor Core SLs	B 2.0-1
B 2.1.2	Reactor Coolant System (RCS) Pressure SL	B 2.0-7
B 3.0	LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY	B 3.0-1
B 3.0	SURVEILLANCE REQUIREMENT (SR) APPLICABILITY	B 3.0-10
B 3.1	REACTIVITY CONTROL SYSTEMS	B 3.1-1
B 3.1.1	SHUTDOWN MARGIN (SDM)	B 3.1-1
B 3.1.2	Reactivity Anomalies	B 3.1-8
B 3.1.3	Control Rod OPERABILITY	B 3.1-13
B 3.1.4	Control Rod Scram Times	B 3.1-22
B 3.1.5	Control Rod Scram Accumulators	B 3.1-29
B 3.1.6	Rod Pattern Control	B 3.1-34
B 3.1.7	Standby Liquid Control (SLC) System	B 3.1-39
B 3.1.8	Scram Discharge Volume (SDV) Vent and Drain Valves ..	B 3.1-48
B 3.2	POWER DISTRIBUTION LIMITS	B 3.2-1
B 3.2.1	AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)	B 3.2-1
B 3.2.2	MINIMUM CRITICAL POWER RATIO (MCPR)	B 3.2-6
B 3.2.3	LINEAR HEAT GENERATION RATE (LHGR)	B 3.2-11
B 3.3	INSTRUMENTATION	B 3.3-1
B 3.3.1.1	Reactor Protection System (RPS) Instrumentation	B 3.3-1
B 3.3.1.2	Wide Range Neutron Monitor (WRNM) Instrumentation	B 3.3-36
B 3.3.2.1	Control Rod Block Instrumentation	B 3.3-45
B 3.3.2.2	Feedwater and Main Turbine High Water Level Trip Instrumentation	B 3.3-58
B 3.3.3.1	Post Accident Monitoring (PAM) Instrumentation	B 3.3-65
B 3.3.3.2	Remote Shutdown System	B 3.3-76
B 3.3.4.1	Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation	B 3.3-83
B 3.3.4.2	End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation . . .	B 3.3-91a thru B 3.3-91j
B 3.3.5.1	Emergency Core Cooling System (ECCS) Instrumentation	B 3.3-92
B 3.3.5.2	Reactor Core Isolation Cooling (RCIC) System Instrumentation	B 3.3-130
B 3.3.5.3	Not Used	B 3.3-140a
B 3.3.5.4	Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation	B 3.3-140b
B 3.3.6.1	Primary Containment Isolation Instrumentation	B 3.3-141
B 3.3.6.2	Secondary Containment Isolation Instrumentation	B 3.3-169
B 3.3.7.1	Main Control Room Emergency Ventilation (MCREV) System Instrumentation	B 3.3-180
B 3.3.8.1	Loss of Power (LOP) Instrumentation	B 3.3-187
B 3.3.8.2	Reactor Protection System (RPS) Electric Power Monitoring	B 3.3-199

(continued)

TABLE OF CONTENTS (continued)

B 3.4	REACTOR COOLANT SYSTEM (RCS)	B 3.4-1
B 3.4.1	Recirculation Loops Operating	B 3.4-1
B 3.4.2	Jet Pumps	B 3.4-11
B 3.4.3	Safety Relief Valves (SRVs) and Safety Valves (SVs)	B 3.4-15
B 3.4.4	RCS Operational LEAKAGE	B 3.4-19
B 3.4.5	RCS Leakage Detection Instrumentation	B 3.4-24
B 3.4.6	RCS Specific Activity	B 3.4-29
B 3.4.7	Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown	B 3.4-33
B 3.4.8	Residual Heat Removal (RHR) Shutdown Cooling System—Cold Shutdown	B 3.4-38
B 3.4.9	RCS Pressure and Temperature (P/T) Limits	B 3.4-43
B 3.4.10	Reactor Steam Dome Pressure	B 3.4-52
B 3.5	EMERGENCY CORE COOLING SYSTEMS (ECCS), RPV WATER INVENTORY CONTROL (WIC), AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM	B 3.5-1
B 3.5.1	ECCS—Operating	B 3.5-1
B 3.5.2	ECCS—Shutdown Deleted	B 3.5-18
B 3.5.3	RCIC System	B 3.5-24
B 3.5.4	RPV Water Inventory Control	B 3.5-25
B 3.6	CONTAINMENT SYSTEMS	B 3.6-1
B 3.6.1.1	Primary Containment	B 3.6-1
B 3.6.1.2	Primary Containment Air Lock	B 3.6-6
B 3.6.1.3	Primary Containment Isolation Valves (PCIVs)	B 3.6-14
B 3.6.1.4	Drywell Air Temperature	B 3.6-31
B 3.6.1.5	Reactor Building-to-Suppression Chamber Vacuum Breakers	B 3.6-34
B 3.6.1.6	Suppression Chamber-to-Drywell Vacuum Breakers	B 3.6-42
B 3.6.2.1	Suppression Pool Average Temperature	B 3.6-48
B 3.6.2.2	Suppression Pool Water Level	B 3.6-53
B 3.6.2.3	Residual Heat Removal (RHR) Suppression Pool Cooling	B 3.6-56
B 3.6.2.4	Residual Heat Removal (RHR) Suppression Pool Spray	B 3.6-60
B 3.6.3.1	Containment Atmospheric Dilution (CAD) System	B 3.6-64
B 3.6.3.2	Primary Containment Oxygen Concentration	B 3.6-70
B 3.6.4.1	Secondary Containment	B 3.6-73
B 3.6.4.2	Secondary Containment Isolation Valves (SCIVs)	B 3.6-78
B 3.6.4.3	Standby Gas Treatment (SGT) System	B 3.6-85
B 3.7	PLANT SYSTEMS	B 3.7-1
B 3.7.1	High Pressure Service Water (HPSW) System	B 3.7-1
B 3.7.2	Emergency Service Water (ESW) System and Normal Heat Sink	B 3.7-6
B 3.7.3	Emergency Heat Sink	B 3.7-11
B 3.7.4	Main Control Room Emergency Ventilation (MCREV) System	B 3.7-15
B 3.7.5	Main Condenser Offgas	B 3.7-22

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY
(continued)

with their setpoints within the specified Allowable Values, where appropriate. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. Table 3.3.5.1-1 is modified by two footnotes. Footnote (a) is added to clarify that the associated functions are required to be OPERABLE in MODES 4 and 5 only when their supported ECCS are required to be operable per LCO 3.5.2, ECCS Shutdown. Footnote (b) is added to show that certain ECCS instrumentation Functions also perform DG initiation.

Allowable Values are specified for each ECCS Function specified in the Table. Trip setpoints are specified in the setpoint calculations. The trip setpoints are selected to ensure that the settings do not exceed the Allowable Value between CHANNEL CALIBRATIONS. Operation with a trip setting less conservative than the trip setpoint, but within its Allowable Value, is acceptable. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel water level), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic or design limits are derived from the limiting values of the process parameters obtained from the safety analysis or other appropriate documents. The Allowable Values are derived from the analytic or design limits, corrected for calibration, process, and instrument errors. The trip setpoints are determined from analytical or design limits, corrected for calibration, process, and instrument errors, as well as, instrument drift. In selected cases, the Allowable Values and trip setpoints are determined from engineering judgement or historically accepted practice relative to the intended functions of the channel. The trip setpoints determined in this manner provide adequate protection by assuming instrument and process uncertainties expected for the environments during the operating time of the associated channels are accounted for. For the Core Spray and LPCI Pump Start-Time Delay Relays, adequate margins for applicable setpoint methodologies are incorporated into the Allowable Values and actual setpoints.

In general, the individual Functions are required to be OPERABLE in the MODES or other specified conditions that may require ECCS (or DG) initiation to mitigate the consequences of a design basis transient or accident. To ensure reliable ECCS and DG function, a combination of Functions is required to provide primary and secondary initiation signals.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

1.a. 2.a. Reactor Vessel Water Level—Low Low Low (Level 1)
(continued)

~~initiation. Per footnote (a) to Table 3.3.5.1 1, this ECCS function is only required to be OPERABLE in MODES 4 and 5 whenever the associated ECCS is required to be OPERABLE per LCO 3.5.2. Refer to LCO 3.5.1 and LCO 3.5.2, "ECCS Shutdown," for Applicability Bases for the low pressure ECCS subsystems; LCO 3.8.1, "AC Sources Operating"; and LCO 3.8.2, "AC Sources Shutdown," for Applicability Bases for the DGs.~~

1.b. 2.b. Drywell Pressure—High

High pressure in the drywell could indicate a break in the reactor coolant pressure boundary (RCPB). The low pressure ECCS and associated DGs are initiated upon receipt of the Drywell Pressure—High Function with a Reactor Pressure—Low (Injection Permissive) in order to minimize the possibility of fuel damage. The DGs are initiated from Function 1.b signals. This Function also initiates the closure of the recirculation discharge valves to ensure the LPCI subsystems inject into the proper RPV location. The Drywell Pressure—High Function with a Reactor Pressure—Low (Injection Permissive), along with the Reactor Water Level—Low Low Low (Level 1) 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 and be indicative of a LOCA inside primary containment.

The Drywell Pressure—High Function is required to be OPERABLE when the ECCS or DG is required to be OPERABLE in conjunction with times when the primary containment is required to be OPERABLE. Thus, four channels of the CS and LPCI Drywell Pressure—High Function are required to be OPERABLE in MODES 1, 2, and 3 to ensure that no single instrument failure can preclude ECCS and DG initiation. In MODES 4 and 5, the Drywell Pressure—High Function is not required, since there is insufficient energy in the reactor to pressurize the primary containment to Drywell Pressure—High setpoint. Refer to LCO 3.5.1 for Applicability Bases for the low pressure ECCS subsystems and to LCO 3.8.1 for Applicability Bases for the DGs.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCD, and
APPLICABILITY
(continued)

1.c, 2.c. Reactor Pressure-Low (Injection Permissive)

Low reactor pressure signals are used as permissives for the low pressure ECCS subsystems. This ensures that, prior to opening the injection valves of the low pressure ECCS subsystems or initiating the low pressure ECCS subsystems on a Drywell Pressure-High signal, the reactor pressure has fallen to a value below these subsystems' maximum design pressure and a break inside the RCPB has occurred respectively. This Function also provides permissive for the closure of the recirculation discharge valves to ensure the LPCI subsystems inject into the proper RPV location. The Reactor Pressure-Low is one of the Functions assumed to be OPERABLE and capable of permitting initiation of the ECCS during the transients analyzed in References 1 and 3. In addition, the Reactor Pressure-Low 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.

The Reactor Pressure-Low signals are initiated from four pressure transmitters that sense the reactor dome pressure.

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

Four channels of Reactor Pressure-Low Function are only required to be OPERABLE when the ECCS is required to be OPERABLE to ensure that no single instrument failure can preclude ECCS initiation. ~~Per Footnote (a) to Table 3.3.5.1 1, this ECCS Function is only required to be OPERABLE in MODES 4 and 5 whenever the associated ECCS is required to be OPERABLE per LCO 3.5.2. Refer to LCO 3.5.1 and LCO 3.5.2 for Applicability Bases for the low pressure ECCS subsystems.~~

1.d, 2.g. Core Spray and Low Pressure Coolant Injection Pump Discharge Flow-Low (Bypass)

The minimum flow instruments are provided to protect the associated low pressure ECCS pump from overheating when the pump is operating and the associated injection valve is not fully open. The minimum flow line valve is opened when low flow is sensed, and the valve is automatically closed when the flow rate is adequate to protect the pump. The LPCI and

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

1.d, 2.g. Core Spray and Low Pressure Coolant Injection
Pump Discharge Flow-Low (Bypass) (continued)

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

One differential pressure switch per ECCS pump is used to detect the associated subsystems' flow rates. The logic is arranged such that each switch causes its associated minimum flow valve to open. The logic will close the minimum flow valve once the closure setpoint is exceeded. The LPCI minimum flow valves are time delayed such that the valves will not open for 10 seconds after the switches detect low flow. The time delay is provided to limit reactor vessel inventory loss during the startup of the RHR shutdown cooling mode. The Pump Discharge Flow-Low Allowable Values are high enough to ensure that the pump flow rate is sufficient to protect the pump, yet low enough to ensure that the closure of the minimum flow valve is initiated to allow full flow into the core.

Each channel of Pump Discharge Flow-Low Function (four CS channels and four LPCI channels) is only required to be OPERABLE when the associated ECCS is required to be OPERABLE to ensure that no single instrument failure can preclude the ECCS function. ~~Per footnote (a) to Table 3.3.5.1 1, this ECCS Function is only required to be OPERABLE in MODES 4 and 5 whenever the associated ECCS is required to be OPERABLE per LCO 3.5.2. Refer to LCO 3.5.1 and LCO 3.5.2 for Applicability Bases for the low pressure ECCS subsystems.~~

1.e, 1.f. Core Spray Pump Start-Time Delay Relay

The purpose of this time delay is to stagger the start of the CS pumps that are in each of Divisions I and II to prevent overloading the power source. This Function is necessary when power is being supplied from the offsite sources or the standby power sources (DG). The CS Pump Start-Time Delay Relays are assumed to be OPERABLE in the accident and transient analyses requiring ECCS initiation. That is, the analyses assume that the pumps will initiate when required and excess loading will not cause failure of the power sources.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

1.e. 1.f. Core Spray Pump Start-Time Delay Relay
(continued)

There are eight Core Spray Pump Start-Time Delay Relays, two in each of the CS pump start logic circuits (one for when offsite power is available and one for when offsite power is not available). One of each type of time delay relay is dedicated to a single pump start logic, such that a single failure of a Core Spray Pump Start-Time Delay Relay will not result in the failure of more than one CS pump. In this condition, three of the four CS pumps will remain OPERABLE; thus, the single failure criterion is met (i.e., loss of one instrument does not preclude ECCS initiation). The Allowable Value for the Core Spray Pump Start-Time Delay Relays is chosen to be long enough so that the power source will not be overloaded and short enough so that ECCS operation is not degraded.

Each channel of Core Spray Pump Start-Time Delay Relay Function is required to be OPERABLE only when the associated CS subsystem is required to be OPERABLE. ~~Per footnote (a) to Table 3.3.5.1 1, this ECCS Function is only required to be OPERABLE in MODES 4 and 5 whenever the associated ECCS is required to be OPERABLE per LCO 3.5.2. Refer to LCO 3.5.1 and LCO 3.5.2 for Applicability Bases for the CS subsystems.~~

2.d. Reactor Pressure-Low Low (Recirculation Discharge Valve Permissive)

Low reactor pressure signals are used as permissives for recirculation discharge valve closure. This ensures that the LPCI subsystems inject into the proper RPV location assumed in the safety analysis. The Reactor Pressure-Low Low is one of the Functions assumed to be OPERABLE and capable of closing the valve during the transients analyzed in References 1 and 3. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46. The Reactor Pressure-Low Low Function is directly assumed in the analysis of the recirculation line break (Ref. 4).

The Reactor Pressure-Low Low signals are initiated from four pressure transmitters that sense the reactor pressure.

The Allowable Value is chosen to ensure that the valves close prior to commencement of LPCI injection flow into the core, as assumed in the safety analysis.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

2.e. Reactor Vessel Shroud Level—Level 0 (continued)

Two channels of the Reactor Vessel Shroud Level—Level 0 Function are only required to be OPERABLE in MODES 1, 2, and 3. In MODES 4 and 5, the specified initiation time of the LPCI subsystems is not assumed, and other administrative controls are adequate to control the valves associated with this Function (since the systems that the valves are opened for are not required to be OPERABLE in MODES 4 and 5 and are normally not used).

2.f. Low Pressure Coolant Injection Pump Start—Time Delay Relay

The purpose of this time delay is to stagger the start of the LPCI pumps that are in each of Divisions I and II, to prevent overloading the power source. This Function is only necessary when power is being supplied from offsite sources. The LPCI pumps start simultaneously with no time delay as soon as the standby source is available. The LPCI Pump Start—Time Delay Relays are assumed to be OPERABLE in the accident and transient analyses requiring ECCS initiation. That is, the analyses assume that the pumps will initiate when required and excess loading will not cause failure of the power sources.

There are eight LPCI Pump Start—Time Delay Relays, two in each of the RHR pump start logic circuits. Two time delay relays are dedicated to a single pump start logic. Both timers in the RHR pump start logic would have to fail to prevent an RHR pump from starting within the required time; therefore, the low pressure ECCS pumps will remain OPERABLE; thus, the single failure criterion is met (i.e., loss of one instrument does not preclude ECCS initiation). The Allowable Values for the LPCI Pump Start—Time Delay Relays are chosen to be long enough so that most of the starting transient of the first pump is complete before starting the second pump on the same 4 kV emergency bus and short enough so that ECCS operation is not degraded.

Each channel of LPCI Pump Start—Time Delay Relay Function is required to be OPERABLE only when the associated LPCI subsystem is required to be OPERABLE. ~~Per footnote (a) to Table 3.3.5.1 1, this ECCS Function is only required to be OPERABLE in MODES 4 and 5 whenever the associated ECCS is required to be OPERABLE per LCO 3.5.2. Refer to LCO 3.5.1 and LCO 3.5.2 for Applicability Bases for the LPCI subsystems.~~

(continued)

BASES

ACTIONS
 (continued)

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

Required Actions B.1 and B.2 are intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in redundant automatic initiation capability being lost for the feature(s). Required Action B.1 features would be those that are initiated by Functions 1.a, 1.b, 2.a, and 2.b (e.g., low pressure ECCS). The Required Action B.2 system would be HPCI. For Required Action B.1, redundant automatic initiation capability is lost if (a) two or more Function 1.a channels are inoperable and untripped such that both trip systems lose initiation capability, (b) two or more Function 2.a channels are inoperable and untripped such that both trip systems lose initiation capability, (c) two or more Function 1.b channels are inoperable and untripped such that both trip systems lose initiation capability, or (d) two or more Function 2.b channels are inoperable and untripped such that both trip systems lose initiation capability. For low pressure ECCS, since each inoperable channel would have Required Action B.1 applied separately (refer to ACTIONS Note), each inoperable channel would only require the affected portion of the associated system of low pressure ECCS and DGs to be declared inoperable. However, since channels in both associated low pressure ECCS subsystems (e.g., both CS subsystems) are inoperable and untripped, and the Completion Times started concurrently for the channels in both subsystems, this results in the affected portions in the associated low pressure ECCS and DGs being concurrently declared inoperable.

For Required Action B.2, redundant automatic HPCI initiation capability is lost if two or more Function 3.a or two Function 3.b channels are inoperable and untripped such that the trip system loses initiation capability. In this situation (loss of redundant automatic initiation capability), the 24 hour allowance of Required Action B.3 is not appropriate and the HPCI System must be declared inoperable within 1 hour. ~~As noted (Note 1 to Required Action B.1), Required Action B.1 is only applicable in MODES 1, 2, and 3. In MODES 4 and 5, the specific initiation time of the low pressure ECCS is not assumed and the probability of a LOCA is lower. Thus, a total loss of~~

(continued)

BASES

ACTIONS

B.1, B.2, and B.3 (continued)

~~initiation capability for 24 hours (as allowed by Required Action B.3) is allowed during MODES 4 and 5. There is no similar Note provided for Required Action B.2 since HPCI instrumentation is not required in MODES 4 and 5; thus, a Note is not necessary.~~

Notes are also provided (Note 2 to Required Action B.1 and the Note to Required Action B.2) to delineate which Required Action is applicable for each Function that requires entry into Condition B if an associated channel is inoperable. This ensures that the proper loss of initiation capability check is performed. Required Action B.1 (the Required Action for certain inoperable channels in the low pressure ECCS subsystems) is not applicable to Function 2.e, since this Function provides backup to administrative controls ensuring that operators do not divert LPCI flow from injecting into the core when needed. Thus, a total loss of Function 2.e capability for 24 hours is allowed, since the LPCI subsystems remain capable of performing their intended function.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action B.1, the Completion Time only begins upon discovery that a redundant feature in the same system (e.g., both CS subsystems) cannot be automatically initiated due to inoperable, untripped channels within the same Function as described in the paragraph above. For Required Action B.2, the Completion Time only begins upon discovery that the HPCI System cannot be automatically initiated due to two inoperable, untripped channels for the associated Function in the same trip system. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 5) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

concurrently declared inoperable. For Functions 1.c, 1.e, 1.f, 2.c, 2.d, and 2.f, the affected portions are the associated low pressure ECCS pumps. ~~As noted (Note 1), Required Action C.1 is only applicable in MODES 1, 2, and 3. In MODES 4 and 5, the specific initiation time of the ECCS is not assumed and the probability of a LOCA is lower. Thus, a total loss of automatic initiation capability for 24 hours (as allowed by Required Action C.2) is allowed during MODES 4 and 5.~~

The

Note 2 states that Required Action C.1 is only applicable for Functions 1.c, 1.e, 1.f, 2.c, 2.d, and 2.f. Required Action C.1 is not applicable to Function 3.c (which also requires entry into this Condition if a channel in this Function is inoperable), since the loss of one channel results in a loss of the Function (two-out-of-two logic). This loss was considered during the development of Reference 5 and considered acceptable for the 24 hours allowed by Required Action C.2.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action C.1, the Completion Time only begins upon discovery that the same feature in both subsystems (e.g., both CS subsystems) cannot be automatically initiated due to inoperable channels within the same Function as described in the paragraph above. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration of channels.

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 5) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, Condition H must be entered and its Required Action taken. The Required Actions do not allow placing the channel in trip since this action would either cause the initiation or it would not necessarily result in a safe state for the channel in all events.

(continued)

BASES

ACTIONS D.1, D.2.1, and D.2.2 (continued)

pipng remains filled with water. Alternately, if it is not desired to perform Required Actions D.2.1 and D.2.2 (e.g., as in the case where shifting the suction source could drain down the HPCI suction piping), Condition H must be entered and its Required Action taken.

E.1 and E.2

Required Action E.1 is intended to ensure that appropriate actions are taken if multiple, inoperable channels within the Core Spray and Low Pressure Coolant Injection Pump, Discharge Flow - Low (Bypass) Functions result in redundant automatic initiation capability being lost for the feature(s). For Required Action E.1, the features would be those that are initiated by Functions 1.d and 2.g (e.g., low pressure ECCS). Redundant automatic initiation capability is lost if (a) two or more Function 1.d channels are inoperable affecting CS pumps in different subsystems or (b) three or more Function 2.g channels are inoperable. Since each inoperable channel would have Required Action E.1 applied separately (refer to ACTIONS Note), each inoperable channel would only require the affected low pressure ECCS pump to be declared inoperable. However, since channels for more than one low pressure ECCS pump are inoperable, and the Completion Times started concurrently for the channels of the low pressure ECCS pumps, this results in the affected low pressure ECCS pumps being concurrently declared inoperable.

In this situation (loss of redundant automatic initiation capability), the 7 day allowance of Required Action E.2 is not appropriate and the subsystem associated with each inoperable channel must be declared inoperable within 1 hour. ~~As noted (Note 1 to Required Action E.1), Required Action E.1 is only applicable in MODES 1, 2, and 3. In MODES 4 and 5, the specific initiation time of the ECCS is not assumed and the probability of a LOCA is lower. Thus, a total loss of initiation capability for 7 days (as allowed by Required Action E.2) is allowed during MODES 4 and 5. A Note is also provided (Note 2 to Required Action E.1) to delineate that Required Action E.1 is only applicable to low~~

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New PBAPS TS Bases Section 3.3.5.3

B 3.3.5.3

B 3.3 INSTRUMENTATION

B 3.3.5.3 Not Used

B 3.3 INSTRUMENTATION

B 3.3.5.4 Reactor Pressure Vessel (RPV) Water Inventory Control
Instrumentation

BASES

BACKGROUND

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

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

With the unit in MODE 4 or 5, RPV water inventory control is not required to mitigate any events or accidents evaluated in the safety analyses. RPV water inventory control is required in MODES 4 and 5 to protect Safety Limit 2.1.1.3 and the fuel cladding barrier to prevent the release of radioactive material should a draining event occur. Under the definition of DRAIN TIME, some penetration flow paths may be excluded from the DRAIN TIME calculation if they will be isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to the TAF when actuated by RPV water level isolation instrumentation.

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BASES (continued)

BACKGROUND
(continued)

The purpose of the RPV Water Inventory Control Instrumentation is to support the requirements of LCO 3.5.4, "Reactor Pressure Vessel (RPV) Water Inventory Control," and the definition of DRAIN TIME. There are functions that are required for manual initiation or operation of the ECCS injection/spray subsystem required to be OPERABLE by LCO 3.5.4 and other functions that support automatic isolation of Residual Heat Removal subsystem and Reactor Water Cleanup system penetration flow path(s) on low RPV water level.

The RPV Water Inventory Control Instrumentation supports operation of core spray (CS) and low pressure coolant injection (LPCI). The equipment involved with each of these systems is described in the Bases for LCO 3.5.4.

APPLICABLE
SAFETY ANALYSIS

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

A double-ended guillotine break of the Reactor Coolant System (RCS) is not postulated in MODES 4 and 5 due to the reduced RCS pressure, reduced piping stresses, and ductile piping systems. Instead, an event is postulated in which a single operator error or initiating event allows draining of the RPV water inventory through a single penetration flow path with the highest flow rate, or the sum of the drain rates through multiple penetration flow paths susceptible to a common mode failure (e.g., seismic event (except when the risk is assessed and managed in accordance with TS LCO 3.0.8), loss of normal power, single human error). It is assumed, based on engineering judgment, that while in MODES 4 and 5, one low pressure ECCS injection/spray subsystem can be manually initiated to maintain adequate reactor vessel water level.

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

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

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

(continued)

BASES (continued)

APPLICABLE
SAFETY ANALYSES
(continued)

Function basis.

Core Spray and Low Pressure Coolant Injection Systems

1.a, 2.a. Reactor Pressure - Low (Injection Permissive)

Low reactor pressure signals are used as permissives for the low pressure ECCS injection/spray subsystem manual injection functions. This function ensures that, prior to opening the injection valves of the low pressure ECCS subsystems, the reactor pressure has fallen to a value below these subsystems' maximum design pressure. While it is assured during MODES 4 and 5 that the reactor pressure will be below the ECCS maximum design pressure, the Reactor Pressure - Low signals are assumed to be OPERABLE and capable of permitting initiation of the ECCS.

The Reactor Pressure - Low signals are initiated from four pressure transmitters that sense the reactor dome pressure.

The Allowable Value is low enough to prevent overpressuring the equipment in the low pressure ECCS.

The four channels of Reactor Pressure - Low Function are required to be OPERABLE in MODES 4 and 5 when ECCS manual initiation is required to be OPERABLE by LCO 3.5.4.

1.b, 2.b. Core Spray and Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)

The minimum flow instruments are provided to protect the associated low pressure ECCS pump from overheating when the pump is operating and the associated injection valve is not fully open. The minimum flow line valve is opened when low flow is sensed, and the valve is automatically closed when the flow rate is adequate to protect the pump.

One differential pressure switch per ECCS pump is used to detect the associated subsystems' flow rates. The logic is arranged such that each transmitter causes its associated minimum flow valve to open. The logic will close the minimum flow valve once the closure setpoint is exceeded. The LPCI minimum flow valves are time delayed such that the valves will not open for 10 seconds after the switches detect low flow. The time delay is provided to limit reactor vessel inventory loss during the startup of the Residual Heat Removal (RHR) shutdown cooling mode.

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BASES (continued)

APPLICABLE
SAFETY ANALYSES
(continued)

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

One channel of the Pump Discharge Flow - Low Function is required to be OPERABLE in MODES 4 and 5 when the associated Core Spray or LPCI pump is required to be OPERABLE by LCO 3.5.4 to ensure the pumps are capable of injecting into the Reactor Pressure Vessel when manually initiated.

A note is added to TS Table 3.3.5.4-1 for Function 2.b to clarify the intent of allowing credit for an OPERABLE Low Pressure Coolant Injection subsystem when it is aligned and operating in the decay heat removal mode of RHR. This note is appropriate since the associated RHR pump minimum flow valve (while operating in the decay heat removal mode) is closed and deactivated to prevent inadvertent vessel drain down events.

1.c, 2.c. Manual Initiation

The Manual Initiation channels consist of pump start hand switches that introduce signals into the appropriate ECCS logic to provide manual initiation capability. There is one hand switch for each of the pumps required for the CS and LPCI subsystems.

There is no allowable value for this Function since the channels are mechanically actuated based solely on the position of the hand switches. A channel of the Manual Initiation Function (one channel per required pump) is required to be OPERABLE in Modes 4 and 5 when the associated ECCS subsystems are required to be OPERABLE per LCO 3.5.4.

RHR System Isolation

3.a Reactor Vessel Water Level - Low, Level 3

The definition of DRAIN TIME allows crediting the closing of penetration flow paths that are capable of being isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to the TAF when actuated by RPV water level isolation instrumentation. The

Reactor Vessel Water Level - Low, Level 3 Function associated with RHR System isolation may be credited for automatic isolation of penetration flow paths associated with the RHR System.

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BASES (continued)

APPLICABLE
SAFETY ANALYSES
(continued)

Reactor Vessel Water Level - Low, Level 3 signals are Reactor 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. While four channels (two channels per trip system) of the Reactor Vessel Water Level - Low, Level 3 Function are available, only two channels (all in the same trip system) are required to be OPERABLE.

The Reactor Vessel Water Level - Low, Level 3 Allowable Value was chosen to be the same as the Primary Containment Isolation Instrumentation Reactor Vessel Water Level - Low, Level 3 Allowable Value (LCO 3.3.6.1), since the capability to cool the fuel may be threatened.

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

Reactor Water Cleanup (RWCU) System Isolation

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

The definition of DRAIN TIME allows crediting the closing of penetration flow paths that are capable of being isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to the TAF when actuated by RPV water level isolation instrumentation. The Reactor Vessel Water Level - Low, Level 3 Function associated with RWCU System isolation may be credited for automatic isolation of penetration flow paths associated with the RWCU System.

Reactor Vessel Water Level - Low, Level 3 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. While four channels (two channels per trip system) of the Reactor Vessel Water Level - Low, Level 3 Function are available, only two channels (all in the same trip system) are required to be OPERABLE.

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

(continued)

BASES (continued)

APPLICABLE
SAFETY ANALYSES
(continued)

This Function isolates the inboard and outboard RWCU pump suction penetration and the outboard valve at the RWCU connection to reactor feedwater.

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

ACTIONS

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

A.1

Required Action A.1 directs entry into the appropriate Condition referenced in Table 3.3.5.4-1. The applicable Condition referenced in the Table is Function dependent. Each time a channel is discovered inoperable, Condition A is entered for that channel and provides for transfer to the appropriate subsequent Condition.

B.1 and B.2

RHR System Isolation, Reactor Vessel Water Level - Low, Level 3, and Reactor Water Cleanup System Isolation, Reactor Vessel Water Level - Low, Level 3 functions are applicable when automatic isolation of the associated penetration flow path is credited in calculating DRAIN TIME. If the instrumentation is inoperable, Required Action B.1 directs an immediate declaration that the associated penetration flow path(s) are incapable of automatic isolation. Required Action B.2 directs calculation of DRAIN TIME. The calculation cannot credit automatic isolation of the affected penetration flow paths.

BASES (continued)

ACTIONS
(continued)

C.1

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

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

D.1

If a Core Spray or Low Pressure Coolant Injection Pump Discharge Flow - Low bypass function is inoperable, there is a risk that the associated low pressure ECCS pump could overheat when the pump is operating and the associated injection valve is not fully open. In this condition, the operator can take manual control of the pump and the injection valve to ensure the pump does not overheat. If a manual initiation function is inoperable, the ECCS subsystem pumps can be started manually and the valves can be opened manually, but this is not the preferred condition.

The 24 hour Completion Time was chosen to allow time for the operator to evaluate and repair any discovered inoperabilities. The Completion Time is appropriate given the ability to manually start the ECCS pumps and open the injection valves and to manually ensure the pump does not overheat.

E.1

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

As noted in the beginning of the SRs, the SRs for each RPV Water Inventory Control instrument Function are found in the SRs column of Table 3.3.5.4-1.

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BASES (continued)

SURVEILLANCE
REQUIREMENTS

SR 3.3.5.4.1

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

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

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

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

SR 3.3.5.4.2

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

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

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

(continued)

BASES (continued)

SURVEILLANCE
REQUIREMENTS
(continued)

SR 3.3.5.4.3

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.4 overlaps this Surveillance to complete testing of the assumed safety function.

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

REFERENCES

1. Information Notice 84-81 "Inadvertent Reduction in Primary Coolant Inventory in Boiling Water Reactors During Shutdown and Startup," November 1984.
2. Information Notice 86-74, "Reduction of Reactor Coolant Inventory Because of Misalignment of RHR Valves," August 1986.
3. Generic Letter 92-04, "Resolution of the Issues Related to Reactor Vessel Water Level Instrumentation in BWRs Pursuant to 10 CFR 50.54(F)," August 1992.
4. NRC Bulletin 93-03, "Resolution of Issues Related to Reactor Vessel Water Level Instrumentation in BWRs," May 1993.
5. Information Notice 94-52, "Inadvertent Containment Spray and Reactor Vessel Draindown at Millstone 1," July 1994.

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

6.a. Reactor Pressure-High (continued)

MODES 1, 2, and 3, since these are the only MODES in which the reactor can be pressurized; thus, equipment protection is needed. The Allowable Value was chosen to be low enough to protect the system equipment from overpressurization.

This Function isolates both RHR shutdown cooling pump suction valves.

6.b. Reactor Vessel Water Level-Low (Level 3)

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, isolation of some reactor vessel interfaces occurs to begin isolating the potential sources of a break. The Reactor Vessel Water Level-Low (Level 3) Function associated with RHR Shutdown Cooling System isolation is not directly assumed in safety analyses because a break of the RHR Shutdown Cooling System is bounded by breaks of the recirculation and MSL. The RHR Shutdown Cooling System isolation on Level 3 supports actions to ensure that the RPV water level does not drop below the top of the active fuel during a vessel draindown event caused by a leak (e.g., pipe break or inadvertent valve opening) in the RHR Shutdown Cooling System.

Reactor Vessel Water Level-Low (Level 3) 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. Four channels (two channels per trip system) of the Reactor Vessel Water Level-Low (Level 3) Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. ~~As noted (footnote (a) to Table 3.3.6.1 1), only one channel per trip system (with an isolation signal available to one shutdown cooling pump suction isolation valve) of the Reactor Vessel Water Level Low (Level 3) Function are required to be OPERABLE in MODES 4 and 5, provided the RHR Shutdown Cooling System integrity is maintained. System integrity is maintained provided the piping is intact and no maintenance is being performed that has the potential for draining the reactor vessel through the system.~~

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

6.b. Reactor Vessel Water Level-Low (Level 3) (continued)

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

The Reactor Vessel Water Level-Low (Level 3) Function is only required to be OPERABLE in ~~MODES 3, 4, and 5~~ to prevent this potential flow path from lowering the reactor vessel level to the top of the fuel. In MODES 1 and 2, another isolation (i.e., Reactor Pressure-High) and administrative controls ensure that this flow path remains isolated to prevent unexpected loss of inventory via this flow path.

This Function isolates both RHR shutdown cooling pump suction valves.

Feedwater Recirculation Isolation

7.a. Reactor Pressure-High

The Reactor Pressure-High Function is provided to isolate the feedwater recirculation line. This interlock is provided only for equipment protection to prevent an intersystem LOCA scenario, and credit for the interlock is not assumed in the accident or transient analysis in the UFSAR.

The Reactor Pressure-High signals are initiated from four transmitters that are connected to different taps on the RPV. Four channels of Reactor Pressure-High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. The Function is only required to be OPERABLE in MODES 1, 2, and 3, since these are the only MODES in which the reactor can be pressurized; thus, equipment protection is needed. The Allowable Value was chosen to be low enough to protect the system equipment from overpressurization.

This Function isolates the feedwater recirculation valves.

Traversing Incore Probe System Isolation

8.a. Reactor Vessel Water Level-Low, Level 3

Low RPV water level indicates that the capability to cool the fuel may be threatened. The valves whose penetrations communicate with the primary containment are isolated to

(continued) †

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

1. Reactor Vessel Water Level-Low (Level 3) (continued)

The Reactor Vessel Water Level-Low (Level 3) Allowable Value was chosen to be the same as the RPS Level 3 scram Allowable Value (LCO 3.3.1.1), since isolation of these valves and SGT System start are not critical to orderly plant shutdown.

The Reactor Vessel Water Level-Low (Level 3) Function is required to be OPERABLE in MODES 1, 2, and 3 where considerable energy exists in the Reactor Coolant System (RCS); thus, there is a probability of pipe breaks resulting in significant releases of radioactive steam and gas. In MODES 4 and 5, the probability and consequences of these events are low due to the RCS pressure and temperature limitations of these MODES; thus, this Function is not required. ~~In addition, the Function is also required to be OPERABLE during operations with a potential for draining the reactor vessel (OPDRVs) because the capability of isolating potential sources of leakage must be provided to ensure that offsite dose limits are not exceeded if core damage occurs.~~

2. Drywell Pressure-High

High drywell pressure can indicate a break in the reactor coolant pressure boundary (RCPB). An isolation of the secondary containment and actuation of the SGT System are initiated in order to minimize the potential of an offsite dose release. The isolation on high drywell pressure supports actions to ensure that any offsite releases are within the limits calculated in the safety analysis. The Drywell Pressure-High Function associated with isolation is not assumed in any UFSAR accident or transient analyses but will provide an isolation and initiation signal. It is retained for the overall redundancy and diversity of the secondary containment isolation instrumentation as required by the NRC approved licensing basis.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

3, 4. Reactor Building Ventilation and Refueling Floor
Ventilation Exhaust Radiation-High (continued)

channels of Reactor Building Ventilation Exhaust Radiation-High Function and four channels of Refueling Floor Ventilation Exhaust Radiation-High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Allowable Values are chosen to promptly detect gross failure of the fuel cladding.

The Reactor Building Ventilation and Refueling Floor Ventilation Exhaust Radiation-High Functions are required to be OPERABLE in MODES 1, 2, and 3 where considerable energy exists; thus, there is a probability of pipe breaks resulting in significant releases of radioactive steam and gas. In MODES 4 and 5, the probability and consequences of these events are low due to the RCS pressure and temperature limitations of these MODES; thus, these Functions are not required. In addition, the Functions are also required to be OPERABLE during ~~OPDRVs~~ and movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment, because the capability of detecting radiation releases due to fuel failures (due to fuel uncover or dropped fuel assemblies) must be provided to ensure that offsite dose limits are not exceeded.

ACTIONS

A Note has been provided to modify the ACTIONS related to secondary containment isolation 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 secondary containment isolation 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 secondary containment isolation instrumentation channel.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY
(continued)

The Control Room Air Intake Radiation—High Function consists of four independent monitors. Two channels of Control Room Air Intake Radiation—High per trip system are available and are required to be OPERABLE to ensure that no single instrument failure can preclude MCREV System initiation. The Allowable Value was selected to ensure protection of the control room personnel.

The Control Room Air Intake Radiation—High Function is required to be OPERABLE in MODES 1, 2, and 3 and during ALTERATIONS, ~~OPDRVs~~, and movement of irradiated fuel assemblies in the secondary containment, to ensure that control room personnel are protected during a LOCA, fuel handling event, ~~or vessel draindown event~~. During MODES 4 and 5, when these specified conditions are not in progress (e.g., CORE ALTERATIONS), the probability of a LOCA or fuel damage is low; thus, the Function is not required.

ACTIONS

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

A.1 and A.2

Because of the redundancy of sensors available to provide initiation signals and the redundancy of the MCREV System design, an allowable out of service time of 6 hours has been shown to be acceptable (Ref. 4), to permit restoration of any inoperable channel to OPERABLE status. However, this out of service time is only acceptable provided the Control Room Air Intake Radiation—High Function is still maintaining MCREV System initiation capability. The Function is considered to be maintaining MCREV System

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

B 3.5.1 ECCS—Operating

BASES

BACKGROUND

The ECCS are designed, in conjunction with the primary and secondary containment, to limit the release of radioactive materials to the environment following a loss of coolant accident (LOCA). The ECCS uses two independent methods (flooding and spraying) to cool the core during a LOCA. The ECCS network consists of the High Pressure Coolant Injection (HPCI) System, the Core Spray (CS) System, the low pressure coolant injection (LPCI) mode of the Residual Heat Removal (RHR) System, and the Automatic Depressurization System (ADS). The suppression pool provides the required source of water for the ECCS. Although no credit is taken in the safety analyses for the condensate storage tank (CST), it is capable of providing a source of water for the HPCI and CS systems.

On receipt of an initiation signal, ECCS pumps automatically start; simultaneously, the system aligns and the pumps inject water, taken either from the CST or suppression pool, into the Reactor Coolant System (RCS) as RCS pressure is overcome by the discharge pressure of the ECCS pumps. Although the system is initiated, ADS action is delayed, allowing the operator to interrupt the timed sequence if the system is not needed. The HPCI pump discharge pressure almost immediately exceeds that of the RCS, and the pump injects coolant into the vessel to cool the core. If the break is small, the HPCI System will maintain coolant inventory as well as vessel level while the RCS is still pressurized. If HPCI fails, it is backed up by ADS in combination with LPCI and CS. In this event, the ADS timed sequence would be allowed to time out and open the selected safety/relief valves (S/RVs) depressurizing the RCS, thus allowing the LPCI and CS to overcome RCS pressure and inject coolant into the vessel. If the break is large, RCS pressure initially drops rapidly and the LPCI and CS cool the core.

Water from the break returns to the suppression pool where it is used again and again. Water in the suppression pool is circulated through an RHR System heat exchanger cooled by the High Pressure Service Water System. Depending on the location and size of the break, portions of the ECCS may be

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BASES

LCO
(continued)

pipng, resulting in the potential to damage the RHR system, including water hammer. This is necessary since the RHR System is required to operate in the shutdown cooling mode to remove decay heat and sensible heat from the reactor. 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 necessary. One LPCI subsystem shall be declared inoperable when MO-34A(B) and MO-39A(B) are simultaneously open in the same subsystem (one or both subsystems) with no Emergency Diesel Generators (EDGs) declared inoperable to ensure compliance to References 7, 14, and 15 single failure analyses (Ref. 11).

If the MO-34A and MO-39A are simultaneously open, the 'A' subsystem of LPCI shall be declared inoperable unless the E-1, E-2, or E-4 EDG is declared inoperable. If the MO-34B and MO-39B are simultaneously open, the 'B' subsystem of LPCI shall be declared inoperable unless the E-1, E-2, or E-3 EDG is 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, HPCI is not required to be OPERABLE because the low pressure ECCS subsystems can provide sufficient flow below this pressure. In MODES 2 and 3, when reactor steam dome pressure is ≤ 100 psig, ADS is 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.~~" **"RPV WATER INVENTORY CONTROL"**

R

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ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable HPCI subsystem. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable HPCI subsystem 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.

(continued)

, RPV WATER INVENTORY CONTROL (WIC),

~~ECCS Shutdown~~
B 3.5.2

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 the NRC Policy Statement.~~

~~LCO Two low pressure ECCS injection/spray subsystems are required to be OPERABLE. A low pressure ECCS injection/spray subsystem consists of a CS subsystem or a LPCI subsystem. 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 one motor driven pump, piping, and valves to transfer water from the suppression pool to the RPV. Only a single LPCI pump is required per subsystem because of the larger injection capacity in relation to a CS subsystem. In MODES 4 and 5, the LPCI cross tie valve is not required to be closed. The necessary portions of the Emergency Service Water System are also required to provide appropriate cooling to each required ECCS subsystem, as necessary (Reference TRM 3.11). Management of gas voids is important to ECCS injection/spray subsystem OPERABILITY.~~

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BASES

LCO
(continued)

~~As noted, one LPCI subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned (remote or local) to the LPCI mode and is not otherwise inoperable. Alignment and operation for decay heat removal includes when the required RHR pump is not operating or when the system is realigned from or to the RHR shutdown cooling mode. This allowance is necessary since the RHR System may be required to operate in the shutdown cooling mode to remove decay heat and sensible heat from the reactor. Because of low pressure and low temperature conditions in MODES 4 and 5, sufficient time will be available to manually align and initiate LPCI subsystem operation to provide core cooling prior to postulated fuel uncoverly.~~

~~The following discussion applies when the LPCI cross tie valve (MO 20) is closed:~~

~~One LPCI subsystem shall not be considered one of the required ECCS injection/spray subsystems when MO 34A(B) and MO 39A(B) are simultaneously open in the same subsystem with no Emergency Diesel Generators (EDGs) declared inoperable. As discussed below, an exception to this may be taken if an EDG is declared inoperable.~~

~~If the MO 34A and MO 39A are simultaneously open, the 'A' subsystem of LPCI shall not be considered as one of the required ECCS injection/spray subsystems unless the E 1, E 2, or E 4 EDG is declared inoperable. If the MO 34B and MO 39B are simultaneously open, the 'B' subsystem of LPCI shall not be considered as one of the required ECCS injection/spray subsystems unless the E 1, E 2, or E 3 EDG is declared inoperable.~~

~~The following discussion applies when the LPCI cross tie valve (MO 20) is open:~~

~~The LPCI cross tie valve (MO 20) cannot be credited for closing during an event to isolate both LPCI subsystems. A pipe break within Primary Containment is assumed when the Reactor Coolant System (RCS) is pressurized. Conversely, a pipe break within Primary Containment is not assumed when the RCS is depressurized.~~

~~Mode 4 with RCS pressurized:~~

~~When the Unit is in Mode 4 with reactor steam dome pressure indicating that the RCS is pressurized, then both subsystems of LPCI are inoperable.~~

~~(continued)~~

BASES

~~LCO
(continued)~~

~~Mode 4 with RCS depressurized or Mode 5:~~

~~MO 34A(B) and MO 39A(B) Closed:~~

~~When the Unit is in Mode 4 with reactor steam dome pressure indicating that the RCS is depressurized or in Mode 5 AND there are no flow paths that could divert LPCI flow going to the reactor vessel (i.e., MO 34/39 closed), then both subsystems of LPCI can be considered operable as the required ECCS injection/spray subsystems.~~

~~MO 34A(B) and MO 39A(B) Open:~~

~~When MO 20, MO 34A, and MO 39A are simultaneously open, the 'A' subsystem of Core Spray and both subsystems of LPCI cannot be considered as separate ECCS injection/spray subsystems because a single failure (failure of the E 3 EDG) exists that causes the 'A' subsystem of Core Spray and both subsystems of LPCI to be unable to perform their design functions. As a result, the 'A' subsystem of Core Spray and both subsystems of LPCI can only be considered as one of the two required ECCS injection/spray subsystems when aligned in this configuration.~~

~~When MO 20, MO 34A, and MO 39A are simultaneously open with either the E 1, E 2, or E 4 EDG declared inoperable, then the 'A' and 'B' subsystems of LPCI may be credited as being operable, separate subsystems, since a failure of the E 3 EDG is not postulated.~~

~~When MO 20, MO 34B, and MO 39B are simultaneously open, the 'B' subsystem of Core Spray and both subsystems of LPCI cannot be considered as separate ECCS injection/spray subsystems because a single failure (failure of E 4 EDG) exists that causes the 'B' subsystem of Core Spray and both subsystems of LPCI to be unable to perform their design functions. As a result, the 'B' subsystem of Core Spray and both subsystems of LPCI can only be considered as one of the two required ECCS injection/spray subsystems when aligned in this configuration.~~

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BASES

~~LCO
(continued)~~

~~When MO 20, MO 34B, and MO 39B are simultaneously open with either the E 1, E 2, or E 3 EDG declared inoperable, then the 'A' and 'B' subsystems of LPCI may be credited as being operable, separate subsystems, since a failure of the E 4 EDG is not postulated.~~

~~APPLICABILITY~~

~~OPERABILITY of the low pressure ECCS injection/spray subsystems is required in MODES 4 and 5 to ensure adequate coolant inventory and sufficient heat removal capability for the irradiated fuel in the core in case of an inadvertent draindown of the vessel. Requirements for ECCS OPERABILITY during MODES 1, 2, and 3 are discussed in the Applicability section of the Bases for LCO 3.5.1. ECCS subsystems are not required to be OPERABLE during MODE 5 with the spent fuel storage pool gates removed, the water level maintained at ≥ 458 inches above reactor pressure vessel instrument zero (20 ft 11 inches above the RPV flange), and no operations with a potential for draining the reactor vessel (OPDRVs) in progress. This provides sufficient coolant inventory to allow operator action to terminate the inventory loss prior to fuel uncover in case of an inadvertent draindown.~~

~~The Automatic Depressurization System is not required to be OPERABLE during MODES 4 and 5 because the RPV pressure is ≤ 100 psig, and the CS System and the LPCI subsystems can provide core cooling without any depressurization of the primary system.~~

~~The High Pressure Coolant Injection System is not required to be OPERABLE during MODES 4 and 5 since the low pressure ECCS injection/spray subsystems can provide sufficient flow to the vessel.~~

~~ACTIONS~~

~~A.1 and B.1~~

~~If any one required low pressure ECCS injection/spray subsystem is inoperable, an inoperable subsystem must be restored to OPERABLE status in 4 hours. In this Condition, the remaining OPERABLE subsystem can provide sufficient vessel flooding capability to recover from an inadvertent vessel draindown. However, overall system reliability is reduced because a single failure in the remaining OPERABLE~~

~~(continued)~~

BASES

ACTIONS

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

~~subsystem concurrent with a vessel draindown could result in the ECCS not being able to perform its intended function. The 4 hour Completion Time for restoring the required low pressure ECCS injection/spray subsystem to OPERABLE status is based on engineering judgment that considered the remaining available subsystem and the low probability of a vessel draindown event.~~

~~With the inoperable subsystem not restored to OPERABLE status in the required Completion Time, action must be immediately initiated to suspend OPDRVs to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.~~

~~C.1, C.2, D.1, D.2, and D.3~~

~~With both of the required ECCS injection/spray subsystems inoperable, all coolant inventory makeup capability may be unavailable. Therefore, actions must immediately be initiated to suspend OPDRVs to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until OPDRVs are suspended. One ECCS injection/spray subsystem must also be restored to OPERABLE status within 4 hours.~~

~~If at least one low pressure ECCS injection/spray subsystem is not restored to OPERABLE status within the 4 hour Completion Time, additional actions are required to minimize any potential fission product release to the environment. This includes ensuring secondary containment is OPERABLE; one standby gas treatment subsystem for Unit 2 is OPERABLE; and secondary containment isolation capability (i.e., one isolation valve and associated instrumentation are OPERABLE or other acceptable administrative controls to assure isolation capability) in each associated secondary containment penetration flow path not isolated that is assumed to be isolated to mitigate radioactivity releases. OPERABILITY may be verified by an administrative check, or by examining logs or other information, to determine whether the components are out of service for maintenance or other reasons. It is not necessary to perform the Surveillances needed to demonstrate the OPERABILITY of the components.~~

~~(continued)~~

BASES

ACTIONS

~~C.1, C.2, D.1, D.2, and D.3 (continued)~~

~~If, however, any required component is inoperable, then it must be restored to OPERABLE status. In this case, the Surveillance may need to be performed to restore the component to OPERABLE status. Actions must continue until all required components are OPERABLE.~~

~~The 4 hour Completion Time to restore at least one low pressure ECCS injection/spray subsystem to OPERABLE status ensures that prompt action will be taken to provide the required cooling capacity or to initiate actions to place the plant in a condition that minimizes any potential fission product release to the environment.~~

SURVEILLANCE
REQUIREMENTS

~~SR 3.5.2.1 and SR 3.5.2.2~~

~~The minimum water level of 11.0 feet required for the suppression pool is periodically verified to ensure that the suppression pool will provide adequate net positive suction head (NPSH) for the CS System and LPCI subsystem pumps, recirculation volume, and vortex prevention. With the suppression pool water level less than the required limit, all ECCS injection/spray subsystems are inoperable unless they are aligned to an OPERABLE CST.~~

~~When suppression pool level is < 11.0 feet, the CS System is considered OPERABLE only if it can take suction from the CST, and the CST water level is sufficient to provide the required NPSH for the CS pump. Therefore, a verification that either the suppression pool water level is ≥ 11.0 feet or that CS is aligned to take suction from the CST and the CST contains ≥ 17.3 feet of water, equivalent to $> 90,976$ gallons of water, ensures that the CS System can supply at least 50,000 gallons of makeup water to the RPV. The unavailable volume of the CST for CS is at the 40,976 gallon level. However, as noted, only one required CS subsystem may take credit for the CST option during OPDRVs. During OPDRVs, the volume in the CST may not provide adequate makeup if the RPV were completely drained. Therefore, only one CS subsystem is allowed to use the CST. This ensures the other required ECCS subsystem has adequate makeup volume.~~

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BASES

~~SURVEILLANCE
REQUIREMENTS~~

~~SR 3.5.2.1 and SR 3.5.2.2 (continued)~~

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

~~SR 3.5.2.3, SR 3.5.2.5, and SR 3.5.2.6~~

~~The Bases provided for SR 3.5.1.1, SR 3.5.1.7, and SR 3.5.1.10 are applicable to SR 3.5.2.3, SR 3.5.2.5, and SR 3.5.2.6, respectively.~~

~~SR 3.5.2.4~~

~~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 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 RHR System, verify each RHR heat exchanger inlet flow control valve is positioned to achieve at least the minimum flow rate required by SR 3.5.1.7. 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 an individual who can rapidly close the system vent flow path if directed.~~

~~(continued)~~

~~BASES~~

~~REFERENCES~~

- ~~1. NEDO 20566A, "General Electric Company Analytical Model for Loss of Coolant Accident Analysis in Accordance with 10 CFR 50 Appendix K," September 1986.~~
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RPV WATER INVENTORY CONTROL (WIC)

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

B 3.5.3 RCIC System

BASES

BACKGROUND

The RCIC System is not part of the ECCS; however, the RCIC System is included with the ECCS section because of their similar functions.

The RCIC System is designed to operate either automatically or manually following reactor pressure vessel (RPV) isolation accompanied by a loss of coolant flow from the feedwater system to provide adequate core cooling and control of the RPV water level. Under these conditions, the High Pressure Coolant Injection (HPCI) and RCIC systems perform similar functions. The RCIC System design requirements ensure that the criteria of Reference 1 are satisfied.

The RCIC System (Ref. 2) consists of a steam driven turbine pump unit, piping, and valves to provide steam to the turbine, as well as piping and valves to transfer water from the suction source to the core via the feedwater system line, where the coolant is distributed within the RPV through the feedwater sparger. Suction piping is provided from the condensate storage tank (CST) and the suppression pool. Pump suction is normally aligned to the CST to minimize injection of suppression pool water into the RPV. However, if the CST water supply is low, an automatic transfer to the suppression pool water source ensures a water supply for continuous operation of the RCIC System. The steam supply to the turbine is piped from a main steam line upstream of the associated inboard main steam line isolation valve.

The RCIC System is designed to provide core cooling for a wide range of reactor pressures (150 psig to 1170 psig). Upon receipt of an initiation signal, the RCIC turbine accelerates to a specified speed. As the RCIC flow increases, the turbine governor valve is automatically adjusted to maintain design flow. Exhaust steam from the RCIC turbine is discharged to the suppression pool. A full flow test line is provided to route water back to the CST to allow testing of the RCIC System during normal operation without injecting water into the RPV.

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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 when the 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 Safeguard 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 satisfies Criterion 4 of the NRC Policy Statement.

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.

In

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RPV inventory control is required by LCO 3.5.4, "RPV Water Level Inventory Control."

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

B 3.5.4 Reactor Pressure Vessel (RPV) Water Inventory Control

BASES

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

**APPLICABLE
SAFETY ANALYSES**

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

A double-ended guillotine break of the Reactor Coolant System (RCS) is not postulated in MODES 4 and 5 due to the reduced RCS pressure, reduced piping stresses, and ductile piping systems. Instead, an event is considered in which single operator error or initiating event allows draining of the RPV water inventory through a single penetration flow path with the highest flow rate, or the sum of the drain rates through multiple penetration flow paths susceptible to a common mode failure (e.g., seismic event (except when risk is assessed and managed in accordance with TS 3.0.8), loss of normal power, single human error). It is assumed, based on engineering judgment, that while in MODES 4 and 5, one low pressure ECCS injection/spray subsystem can maintain adequate reactor vessel water level.

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

LCO

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

(continued)

BASES

LCO
(continued)

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

One low pressure ECCS injection/spray subsystem is required to be OPERABLE and capable of being manually started to provide defense-in-depth should an unexpected draining event occur. A low pressure ECCS injection/spray subsystem consists of either one Core Spray (CS) subsystem or one Low Pressure Coolant Injection (LPCI) subsystem.

Each CS subsystem consists of one motor driven pump, piping, and valves to transfer water from the suppression pool or condensate storage tank (CST) to the RPV.

Each LPCI subsystem consists of one motor driven pump, piping, and valves to transfer water from the suppression pool to the RPV. In MODES 4 and 5, the RHR System cross tie valve is not required to be closed.

The LCO is modified by a Note which allows a required LPCI subsystem to be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned (remote or local) to the LPCI mode and is not otherwise inoperable.

Alignment and operation for decay heat removal includes when the required RHR pump is not operating or when the system is realigned from or to the RHR shutdown cooling mode. This allowance is necessary since the RHR System may be required to operate in the shutdown cooling mode to remove decay heat and sensible heat from the reactor. Because of the restrictions on DRAIN TIME, sufficient time will be available following an unexpected draining event to manually align and initiate LPCI subsystem operation to maintain RPV water inventory prior reaching the TAF.

APPLICABILITY

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

(continued)

BASES

ACTIONS

A.1 and B.1

If the required low pressure ECCS injection/spray subsystem is inoperable, it must be restored to OPERABLE status within 4 hours. In this Condition, the LCO controls on DRAIN TIME minimize the possibility that an unexpected draining event could necessitate the use of the ECCS injection/spray subsystem, however the defense-in-depth provided by the ECCS injection/spray subsystem is lost.

The 4 hour Completion Time for restoring the required low pressure ECCS injection/spray subsystem to OPERABLE status is based on engineering judgment that considers the LCO controls on DRAIN TIME and the low probability of an unexpected draining event that would result in loss of RPV water inventory.

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

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

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

The secondary containment provides a controlled volume in which fission products can be contained, diluted, and processed prior to release to the environment. Required Action C.1 requires verification of the capability to establish the secondary containment boundary in less than the DRAIN TIME.

(continued)

BASES

ACTIONS
(continued)

The required verification confirms actions to establish the secondary containment boundary are preplanned and necessary materials are available. The secondary containment boundary is considered established when one Standby Gas Treatment (SGT) subsystem is capable of maintaining a negative pressure in the secondary containment with respect to the environment. Verification that the secondary containment boundary can be established must be performed within 4 hours. The required verification is an administrative activity and does not require manipulation or testing of equipment.

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

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

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

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

Required Action D.1 requires immediate action to establish an additional method of water injection augmenting the ECCS injection/spray subsystem required by the LCO. The additional method of water injection includes the necessary instrumentation and controls, water sources, and pumps and

(continued)

BASES

ACTIONS
(continued)

valves needed to add water to the RPV or refueling cavity should an unexpected draining event occur. The Note to Required Action D.1 states that either the ECCS injection/spray subsystem or the additional method of water injection must be capable of operating without offsite electrical power. The additional method of water injection may be manually initiated and may consist of one or more systems or subsystems. The additional method of water injection must be able to access water inventory capable of being injected to maintain the RPV water level above the TAF for ≥ 36 hours. The additional method of water injection and the ECCS injection/spray subsystem may share all or part of the same water sources. If recirculation of injected water would occur, it may be credited in determining the required water volume.

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

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

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

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

E.1

If the Required Actions and associated Completion times of Conditions C or D are not met or if the DRAIN TIME is less

(continued)

BASES

ACTIONS
(continued)

than 1 hour, actions must be initiated immediately to restore the DRAIN TIME to ≥ 36 hours. In this condition, there may be insufficient time to respond to an unexpected draining event to prevent the RPV water inventory from reaching the TAF. Note that Required Actions D.1, D.2, D.3, and D.4 are also applicable when DRAIN TIME is less than 1 hour.

SURVEILLANCE
REQUIREMENTS

SR 3.5.4.1

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

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

The definition of DRAIN TIME excludes from the calculation those penetration flow paths connected to an intact closed system, or isolated by manual or automatic valves that are locked, sealed, or otherwise secured in the closed position, blank flanges, or other devices that prevent flow of reactor coolant through the penetration flow paths. A blank flange or other bolted device must be connected with a sufficient number of bolts to prevent draining in the event of an Operating Basis Earthquake. Normal or expected leakage from closed systems or past isolation devices is permitted. Determination that a system is intact and closed or isolated must consider the status of branch lines and ongoing plant maintenance and testing activities.

The Residual Heat Removal (RHR) Shutdown Cooling System is only considered an intact closed system when misalignment issues (Reference 6) have been precluded by functional valve

(continued)

BASES

SURVEILLANCE
REQUIREMENTS
(continued)

interlocks or by isolation devices, such that redirection of RPV water out of an RHR subsystem is precluded. Further, RHR Shutdown Cooling System is only considered an intact closed system if its controls have not been transferred to Remote Shutdown, which disables the interlocks and isolation signals.

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

Surveillance Requirement 3.0.1 requires SRs to be met between performances. Therefore, any changes in plant conditions that would change the DRAIN TIME requires that a new DRAIN TIME be determined.

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

SR 3.5.4.2 and SR 3.5.4.3

The minimum water level of 11.0 ft. required for the suppression pool is periodically verified to ensure that the suppression pool will provide adequate net positive suction head (NPSH) for the CS subsystem or LPCI subsystem pump, recirculation volume, and vortex prevention. With the suppression pool water level less than the required limit required ECCS injection/spray subsystem is inoperable unless aligned to an OPERABLE CST.

The required CS System is OPERABLE only if it can take suction from the CST, and the CST water level is sufficient to provide the required NPSH for the CS pump. Therefore, a verification that either the suppression pool water level is ≥ 11.0 ft. or that a required CS subsystem is aligned to take suction from the CST and the CST contains $\geq 90,976$ gallons of water, equivalent to 17.3 ft., ensures that the CS subsystem can supply at least 50,000 gallons of makeup water to the RPV. The CS suction is uncovered at the 40,976 gallon level.

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

(continued)

BASES

SURVEILLANCE
REQUIREMENTS
(continued)

SR 3.5.4.4

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

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

SR 3.5.4.5

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

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

SR 3.5.4.6

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

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

SR 3.5.4.7

Verifying that each valve credited for automatically isolating

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BASES

SURVEILLANCE
REQUIREMENTS
(continued)

a penetration flow path actuates to the isolation position on an actual or simulated RPV water level isolation signal is required to prevent RPV water inventory from dropping below the TAF should an unexpected draining event occur.

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

SR 3.5.4.8

The required ECCS subsystem is required to be manually actuated. This Surveillance verifies that the required CS subsystems or LPCI subsystem (including the associated pump / valve(s)) can be placed into service.

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

REFERENCES

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

LCO
(continued)

de-activated and secured in their closed position, blind flanges are in place, and closed systems are intact. These passive isolation valves and devices are those listed in Reference 2 and Reference 5.

MSIVs must meet additional leakage rate requirements. Other PCIV leakage rates are addressed by LCO 3.6.1.1, "Primary Containment," as Type B or C testing.

This LCO provides assurance that the PCIVs will perform their designed safety functions to minimize the loss of reactor coolant inventory and establish the primary containment boundary during accidents.

APPLICABILITY

when the

In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, ~~most~~ PCIVs are not required to be OPERABLE and the primary containment purge and exhaust valves are not required to be normally closed in MODES 4 and 5. Certain valves, however, are required to be OPERABLE to prevent inadvertent reactor vessel draindown. ~~These valves are those whose~~ associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation." (This does not include the valves that isolate the associated instrumentation.)

ACTIONS

The ACTIONS are modified by a Note allowing penetration flow path(s) except for purge or exhaust valve flow path(s) to be unisolated intermittently under administrative controls. These controls consist of stationing a dedicated operator at the controls of the valve, who is in continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for primary containment isolation is indicated. Due to the size of the primary containment purge line penetration and the fact that those penetrations exhaust directly from the containment atmosphere to the environment, the penetration flow path containing these valves is not allowed to be operated under administrative controls.

(continued)

BASES

ACTIONS
(continued)

~~G.1 and G.2~~

If any Required Action and associated Completion Time cannot be met for PCIV(s) required to be OPERABLE during MODE 4 or 5, the unit must be placed in a condition in which the LCO does not apply. Action must be immediately initiated ~~to suspend operations with a potential for draining the reactor vessel (OPDRVs) to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended and valve(s) are restored to OPERABLE status. If suspending an OPDRV would result in closing the residual heat removal (RHR) shutdown cooling isolation valves, an alternative Required Action is provided to immediately initiate action~~ to restore the valve(s) to OPERABLE status. This allows RHR to remain in service while actions are being taken to restore the valve.

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BASES (continued)

APPLICABLE SAFETY ANALYSES Initial suppression pool water level affects suppression pool temperature response calculations, calculated drywell pressure during vent clearing for a DBA, calculated pool swell loads for a DBA LOCA, and calculated loads due to S/RV discharges. Suppression pool water level must be maintained within the limits specified so that the safety analysis of Reference 1 remains valid.

Suppression pool water level satisfies Criteria 2 and 3 of the NRC Policy Statement.

LCO A limit that suppression pool water level be ≥ 14.5 feet and ≤ 14.9 feet is required to ensure that the primary containment conditions assumed for the safety analyses are met. Either the high or low water level limits were used in the safety analyses, depending upon which is more conservative for a particular calculation.

APPLICABILITY In MODES 1, 2, and 3, a DBA would cause significant loads on the 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. The requirement for maintaining suppression pool water level within limits in MODE 4 or 5 is addressed in LCO 3.5.2, 4

"RPV Water Inventory Control"

~~"ECGS Shutdown"~~

ACTIONS A.1

With suppression pool water level outside the limits, the conditions assumed for the safety analyses are not met. If water level is below the minimum level, the pressure suppression function still exists as long as main vents are covered, HPCI and RCIC turbine exhausts are covered, and S/RV quenchers are covered. If suppression pool water level is above the maximum level, protection against overpressurization still exists due to the margin in the peak containment pressure analysis and the capability of the Drywell Spray System. Therefore, continued operation for a limited time is allowed. The 2 hour Completion Time is sufficient to restore suppression pool water level to within limits. Also, it takes into account the low probability of an event impacting the suppression pool water level occurring during this interval.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES
(continued)

however, its leak tightness is required to ensure that fission products entrapped within the secondary containment structure will be treated by the SGT System prior to discharge to the environment.

Secondary containment satisfies Criterion 3 of the NRC Policy Statement.

LCO

An OPERABLE secondary containment provides a control volume into which fission products that leak from primary containment, or are released from the reactor coolant pressure boundary components located in secondary containment, can be processed prior to release to the environment. For the secondary containment to be considered OPERABLE, it must have adequate leak tightness to ensure that the required vacuum can be established and maintained.

APPLICABILITY

In MODES 1, 2, and 3, a LOCA could lead to a fission product release to primary containment that leaks to secondary containment. Therefore, secondary containment OPERABILITY is required during the same operating conditions that require primary containment OPERABILITY.

In MODES 4 and 5, the probability and consequences of the LOCA are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining secondary containment OPERABLE is not required in MODE 4 or 5, except for other situations for which significant releases of radioactive material can be postulated, such as ~~during operations with a potential for draining the reactor vessel (OPDRVs), or during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment.~~ However, outside ground level hatches (hatches H15 through H19 and Torus room access hatch H33) may not be opened during movement of irradiated fuel. This will maintain CR doses acceptable.

ACTIONS

A.1

If secondary containment is inoperable, it must be restored to OPERABLE status within 4 hours. The 4 hour Completion Time provides a period of time to correct the problem that is commensurate with the importance of maintaining secondary containment during MODES 1, 2, and 3. This time period also ensures that the probability of an accident (requiring secondary containment OPERABILITY) occurring during periods where secondary containment is inoperable is minimal.

(continued)

BASES

ACTIONS
(continued)

B.1

If secondary containment cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant 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. 3) 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. 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.

~~C.1, and C.2~~

Movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment ~~and OPDRVs~~ can be postulated to cause fission product release to the secondary containment. In such cases, the secondary containment is the only barrier to release of fission products to the environment. Therefore, movement of RECENTLY IRRADIATED FUEL assemblies must be immediately suspended if the secondary containment is inoperable.

Suspension of these activities shall not preclude completing an action that involves moving a component to a safe position. ~~Also, action must be immediately initiated to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.~~

Required Action C.1 has been modified by a Note stating that LCO 3.0.3 is not applicable, since the movement of RECENTLY IRRADIATED FUEL can only be performed in MODES 4 and 5.

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BASES

APPLICABLE
SAFETY ANALYSES
(continued)

boundary established by SCIVs is required to ensure that leakage from the primary containment is processed by the Standby Gas Treatment (SGT) System before being released to the environment.

Maintaining SCIVs OPERABLE with isolation times within limits ensures that fission products will remain trapped inside secondary containment so that they can be treated by the SGT System prior to discharge to the environment.

SCIVs satisfy Criterion 3 of the NRC Policy Statement.

LCO

SCIVs form a part of the secondary containment boundary. The SCIV safety function is related to control of offsite radiation releases resulting from DBAs.

The power operated automatic isolation valves are considered OPERABLE when their isolation times are within limits and the valves actuate on an automatic isolation signal. The valves covered by this LCO, along with their associated stroke times, are listed in Reference 2. ✕

The normally closed isolation valves or blind flanges are considered OPERABLE when manual valves are closed or open in accordance with appropriate administrative controls, automatic SCIVs are de-activated and secured in their closed position, and blind flanges are in place. These passive isolation valves or devices are listed in Reference 2. ✕

APPLICABILITY

In MODES 1, 2, and 3, a DBA could lead to a fission product release to the primary containment that leaks to the secondary containment. Therefore, the OPERABILITY of SCIVs is required.

In MODES 4 and 5, the probability and consequences of these events are reduced due to pressure and temperature limitations in these MODES. Therefore, maintaining SCIVs OPERABLE is not required in MODE 4 or 5, except for other situations under which significant radioactive releases can be postulated, such as ~~during operations with a potential for draining the reactor vessel (OPDRVs) or~~ during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment. SCIVs are only required to be OPERABLE during OPDRVs or handling RECENTLY IRRADIATED FUEL. Moving irradiated fuel assemblies in the secondary containment may also occur in MODES 1, 2, and 3. ✕

(continued)

BASES

ACTIONS
(continued)

C.1 and C.2

If any Required Action and associated Completion Time cannot be met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

D.1 and D.2

If any Required Action and associated Completion Time are not met, the plant must be placed in a condition in which the LCO does not apply. If applicable, CORE ALTERATIONS and the movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment must be immediately suspended. Suspension of this activity shall not preclude completion of movement of a component to a safe position. ~~Also, if applicable, actions must be immediately initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.~~

Required Action D.1 has been modified by a Note stating that LCO 3.0.3 is not applicable, since the movement of RECENTLY IRRADIATED FUEL can only be performed in MODES 4 and 5.

SURVEILLANCE
REQUIREMENTS

SR 3.6.4.2.1

This SR verifies that each secondary containment manual isolation valve and blind flange that is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside of the secondary containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification that those SCIVs in secondary containment that are capable of being mispositioned are in the correct position.

(continued)

BASES

LCO
(continued) For Unit 2, one SGT subsystem is OPERABLE when one charcoal filter train, one fan (OAVO20) and associated ductwork, dampers, valves, and controls are OPERABLE. The second SGT subsystem is OPERABLE when the other charcoal filter train, one fan (OBVO20) and associated ductwork, damper, valves, and controls are OPERABLE.

APPLICABILITY In MODES 1, 2, and 3, a DBA could lead to a fission product release to primary containment that leaks to secondary containment. Therefore, SGT System OPERABILITY is required during these MODES.

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 the SGT System in OPERABLE status is not required in MODE 4 or 5, except for other situations under which significant releases of radioactive material can be postulated, such as during ~~operations with a potential for draining the reactor vessel (OPDRVs), or during~~ movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment. The SGT System is only required to be OPERABLE during OPDRVs or handling of RECENTLY IRRADIATED FUEL.

ACTIONS

A.1

With one SGT subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status in 7 days. In this Condition, the remaining OPERABLE SGT subsystem is adequate to perform the required radioactivity release control function. However, the overall system reliability is reduced because a single failure in the OPERABLE subsystem could result in the radioactivity release control function not being adequately performed. The 7 day Completion Time is based on consideration of such factors as the availability of the OPERABLE redundant SGT subsystem and the low probability of a DBA occurring during this period.

B.1

If the SGT subsystem cannot be restored to OPERABLE status within the required Completion Time in MODE 1, 2, or 3, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. Remaining in the

(continued)

BASES

ACTIONS

B.1 (continued)

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. 3) 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. 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.

C.1, ~~C.2.1,~~ and C.2.2

During movement of RECENTLY IRRADIATED FUEL assemblies, in the secondary containment ~~or during OPDRVs,~~ when Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE SGT subsystem should immediately be placed in operation. This action ensures that the remaining subsystem is OPERABLE, that no failures that could prevent automatic actuation have occurred, and that any other failure would be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that represent a potential for releasing radioactive material to the secondary containment, thus placing the plant in a condition that minimizes risk. If applicable, movement of RECENTLY IRRADIATED FUEL assemblies must immediately be suspended. Suspension of this activity must not preclude completion of movement of a component to a safe position. ~~Also, if applicable, actions must immediately be initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.~~

The Required Actions of Condition C have been modified by a Note stating that LCO 3.0.3 is not applicable, since the movement of RECENTLY IRRADIATED FUEL can only be performed in MODES 4 and 5.

(continued)

BASES

ACTIONS
(continued)

D.1

If both SGT subsystems are inoperable in MODE 1, 2, or 3, the SGT System may not be capable of supporting the required radioactivity release control function. Therefore, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant 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. 3) 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. 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.

~~E.1 and E.2~~

When two SGT subsystems are inoperable, if applicable, movement of RECENTLY IRRADIATED FUEL assemblies in secondary containment must immediately be suspended. Suspension of this activity shall not preclude completion of movement of a component to a safe position. ~~Also, if applicable, actions must immediately be initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.~~

Required Action E.1 has been modified by a Note stating that LCO 3.0.3 is not applicable, since the movement of RECENTLY IRRADIATED FUEL can only be performed in MODES 4 and 5.

SURVEILLANCE
REQUIREMENTS

SR 3.6.4.3.1

Operating each SGT subsystem (including each filter train fan) for ≥ 15 minutes ensures that both subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. Operation with the heaters on (automatic heater cycling to maintain temperature) for ≥ 15 minutes periodically is sufficient to eliminate moisture on the adsorbers and HEPA filters since during idle periods instrument air is injected into the filter plenum to keep the filters dry. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. +

(continued)

BASES (continued)

APPLICABILITY

In MODES 1, 2, and 3, the MCREV System must be OPERABLE to ensure that the CRE will remain habitable during and following a DBA, since the DBA could lead to a fission product release.

In MODES 4 and 5, the probability and consequences of a DBA are reduced because of the pressure and temperature limitations in these MODES. Therefore, maintaining the MCREV System OPERABLE is not required in MODE 4 or 5, except ~~for the following situations under which significant radioactive releases can be postulated:~~

a.

~~a. During operations with potential for draining the reactor vessel (OPDRVs);~~

~~b. During CORE ALTERATIONS; and~~

b.

c. During movement of irradiated fuel assemblies in the secondary containment.

ACTIONS

A.1

With one MCREV subsystem inoperable, for reasons other than an inoperable CRE boundary, the inoperable MCREV subsystem must be restored to OPERABLE status within 7 days. With the unit in this condition, the remaining OPERABLE MCREV subsystem is adequate to maintain control room temperature and to perform the CRE occupant protection function. However, the overall reliability is reduced because a failure in the OPERABLE subsystem could result in loss of the MCREV System function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and that the remaining subsystem can provide the required capabilities.

B.1, B.2 and B.3

If the unfiltered inleakage of potentially contaminated air past a CRE boundary and into the CRE can result in CRE occupant radiological dose greater than the calculated dose of the licensing basis analyses of DBA consequences (allowed to be up to 5 rem total effective dose equivalent (TEDE)), or inadequate protection of CRE occupants from hazardous chemicals or smoke that have been licensed to occur, the CRE boundary is inoperable. Actions must be taken to restore an OPERABLE CRE boundary within 90 days.

(continued)

and

BASES

ACTIONS
(continued)

~~D.1, D.2.1, D.2.2 and D.2.3~~

The Required Actions of Condition D are modified by a Note indicating that LCO 3.0.3 does not apply. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, ~~or during OPDRVs~~, if the inoperable MCREV subsystem cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE MCREV subsystem may be placed in operation. This action ensures that the remaining subsystem is OPERABLE, that no failures that would prevent automatic actuation will occur, and that any active failure will be readily detected.

An alternative to Required Action D.1 is to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk.

If applicable, CORE ALTERATIONS and movement of irradiated fuel assemblies in the secondary containment must be suspended immediately. Suspension of these activities shall not preclude completion of movement of a component to a safe position. ~~Also, if applicable, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.~~

E.1

If both MCREV subsystems are inoperable in MODE 1, 2, or 3 for reasons other than an inoperable CRE boundary (i.e., Condition B), the MCREV System may not be capable of performing the intended function. Therefore, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant 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. 5) 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. 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.

(continued)

and

BASES

ACTIONS
(continued)

~~F.1, F.2 and F.3~~

The Required Actions of Condition F are modified by a Note indicating that LCO 3.0.3 does not apply. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, ~~or during OPDRVs~~, with two MCREV subsystems inoperable or with one or more MCREV subsystems inoperable due to an inoperable CRE boundary, action must be taken immediately to suspend activities that present a potential for releasing radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk.

If applicable, CORE ALTERATIONS and movement of irradiated fuel assemblies in the secondary containment must be suspended immediately. Suspension of these activities shall not preclude completion of movement of a component to a safe position. ~~If applicable, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.~~

SURVEILLANCE
REQUIREMENTS

SR 3.7.4.1

This SR verifies that a subsystem in a standby mode starts on demand and continues to operate for ≥ 15 minutes. Standby systems should be checked periodically to ensure that they start and function properly. As the environmental and normal operating conditions of this system are not severe, testing each subsystem periodically provides an adequate check on this system. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.4.2

This SR verifies that the required MCREV testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

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B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 AC Sources—Shutdown

BASES

BACKGROUND A description of the AC sources is provided in the Bases for LCO 3.8.1, "AC Sources—Operating."

APPLICABLE SAFETY ANALYSES The OPERABILITY of the minimum AC sources during MODES 4 and 5 and during movement of irradiated fuel assemblies in secondary containment ensures that:

- a. The facility can be maintained in the shutdown or refueling condition for extended periods;
- b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and
- c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as ~~an inadvertent draindown of the vessel or a fuel handling accident.~~

In general, when the unit is shut down the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or loss of all onsite power is not required. The rationale for this is based on the fact that many Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, and 3 have no specific analyses in MODES 4 and 5. Worst case bounding events are deemed not credible in MODES 4 and 5 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and corresponding stresses result in the probabilities of occurrences significantly reduced or eliminated, and minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

During MODES 1, 2, and 3, various deviations from the analysis assumptions and design requirements are allowed within the ACTIONS. This allowance is in recognition that

(continued)

BASES

LCO
(continued)

offsite circuit. In addition, some equipment that may be required by Unit 2 is powered from Unit 3 sources (e.g., Standby Gas Treatment (SGT) System). Therefore, one qualified circuit between the offsite transmission network and the Unit 3 onsite Class 1E AC electrical power distribution subsystem(s), and one DG (not necessarily a different DG than those being used to meet LCO 3.8.2.b requirements) capable of supplying power to one of the required Unit 3 subsystems of each of the required components must also be OPERABLE. Together, OPERABILITY of the required offsite circuit(s) and required DG(s) ensures the availability of sufficient AC sources to operate the plant in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents ~~and reactor vessel draindown~~). Automatic initiation of the required DG during shutdown conditions is specified in ~~LCO 3.3.5.1, ECCS Instrumentation, and LCO 3.3.8.1, LOP Instrumentation.~~

The qualified Unit 2 offsite circuit must be capable of maintaining rated frequency and voltage while connected to the respective Unit 2 4 kV emergency bus(es), and of accepting required loads during an accident. Qualified offsite circuits are those that are described in the UFSAR, Technical Specification Bases Section 3.8.1 and are part of the licensing basis for the unit. A Unit 2 offsite circuit consists of the incoming breaker and disconnect to the startup and emergency auxiliary transformer, the respective circuit path to the emergency auxiliary transformer, and the circuit path to the Unit 2 4 kV emergency buses required by LCO 3.8.8, including feeder breakers to the required Unit 2 4 kV emergency buses. A qualified Unit 3 offsite circuit's requirements are the same as the Unit 2 circuit's requirements, except that the circuit path, including the feeder breakers, is to the Unit 3 4 kV emergency buses required to be OPERABLE by LCO 3.8.8.

The required DGs must be capable of starting, accelerating to rated speed and voltage, and connecting to their respective Unit 2 emergency bus on detection of bus undervoltage. This sequence must be accomplished within 10 seconds. Each DG must also be capable of accepting required loads within the assumed loading sequence intervals, and must continue to operate until offsite power can be restored to the 4 kV emergency buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with engine hot and DG in standby with engine at ambient conditions. Additional

(continued)

BASES

LCO
(continued)

DG capabilities must be demonstrated to meet required Surveillances, e.g., capability of the DG to revert to standby status on an ECCS signal while operating in parallel test mode. Proper sequencing of loads is a required function for DG OPERABILITY. The necessary portions of the Emergency Service Water System are also required to provide appropriate cooling to each required DG.

The OPERABILITY requirements for the DG capable of supplying power to the Unit 3 powered equipment are the same as described above, except that the required DG must be capable of connecting to its respective Unit 3 4 kV emergency bus. (In addition, the Unit 3 ECCS initiation logic SRs are not applicable, as described in SR 3.8.2.2 Bases.)

It is acceptable for 4 kV emergency buses to be cross tied during shutdown conditions, permitting a single offsite power circuit to supply all required buses. No automatic transfer capability is required for offsite circuits to be considered OPERABLE.

APPLICABILITY

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

that provide core cooling

- a. ~~Systems providing adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core in case of an inadvertent draindown of the reactor vessel;~~
- b. Systems needed to mitigate a fuel handling accident are available;
- c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and
- d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

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

(continued)

BASES (continued)

ACTIONS

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

A.1 and B.1

With one or more required offsite circuits inoperable, or with one DG inoperable, the remaining required sources may be capable of supporting sufficient required features (e.g., system, subsystem, division, component, or device) to allow continuation of CORE ALTERATIONS, fuel movement, ~~and operations with a potential for draining the reactor vessel.~~ For example, if two or more 4 kV emergency buses are required per LCO 3.8.8, one 4 kV emergency bus with offsite power available may be capable of supplying sufficient required features. By the allowance of the option to declare required features inoperable that are not powered from offsite power (Required Action A.1) or capable of being powered by the required DG (Required Action B.1), appropriate restrictions can be implemented in accordance with the affected feature(s) LCOs' ACTIONS. Required features remaining powered from a qualified offsite power circuit, even if that circuit is considered inoperable because it is not powering other required features, are not declared inoperable by this Required Action. If a single DG is credited with meeting both LCO 3.8.2,d and one of the DG requirements of LCO 3.8.2.b, then the required features remaining capable of being powered by the DG are not declared inoperable by this Required Action, even if the DG is considered inoperable because it is not capable of powering other required features.

and

A.2.1, A.2.2, A.2.3, ~~A.2.4~~, B.2.1, B.2.2, B.2.3, ~~B.2.4~~, C.1, C.2, C.3, and C.4

and

With an offsite circuit not available to all required 4 kV emergency buses or one required DG inoperable, the option still exists to declare all required features inoperable

(continued)

BASES

ACTIONS

~~A.2.1, A.2.2, A.2.3, A.2.4, B.2.1, B.2.2, B.2.3, B.2.4, C.1, C.2, C.3, and C.4~~ (continued)

and

(per Required Actions A.1 and B.1). Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With two or more required DGs inoperable, the minimum required diversity of AC power sources may not be available. It is, therefore, required to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies in the secondary containment, ~~and activities that could result in inadvertent draining of the reactor vessel.~~

and

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC sources and to continue this action until restoration is accomplished in order to provide the necessary AC power to the plant safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the plant safety systems may be without sufficient power.

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A have been modified by a Note to indicate that when Condition A is entered with no AC power to any required 4 kV emergency bus, ACTIONS for LCO 3.8.8 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite circuit whether or not a required bus is de-energized. LCO 3.8.8 provides the appropriate restrictions for the situation involving a de-energized bus.

SURVEILLANCE
REQUIREMENTS

SR 3.8.2.1

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the Unit 2 AC sources in other than MODES 1, 2, and 3. SR 3.8.1.8 is not

(continued)

BASES

SURVEILLANCE
REQUIREMENTS

SR 3.8.2.1 (continued)

required to be met since only one offsite circuit is required to be OPERABLE. SR 3.8.1.17 is not required to be met because the required OPERABLE DG(s) is not required to undergo periods of being synchronized to the offsite circuit. SR 3.8.1.20 is excepted because starting independence is not required with the DG(s) that is not required to be OPERABLE. Refer to the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DG(s) from being paralleled with the offsite power network or otherwise rendered inoperable during the performance of SRs, and to preclude de-energizing a required 4 kV emergency bus or disconnecting a required offsite circuit during performance of SRs. With limited AC sources available, a single event could compromise both the required circuit and the DG. It is the intent that these SRs must still be capable of being met, but actual performance is not required during periods when the DG and offsite circuit are required to be OPERABLE.

This SR is modified by a second Note. The reason for the Note is to preclude requiring the automatic functions of the DG(s) on an ECCS initiation to be functional during periods when ECCS are not required. ~~Periods in which ECCS are not required are specified in LCO 3.5.2, "ECCS Shutdown".~~

SR 3.8.2.2

This Surveillance is provided to direct that the appropriate Surveillances for the required Unit 3 AC sources are governed by the Unit 3 Technical Specifications. Performance of the applicable Unit 3 Surveillances will satisfy Unit 3 requirements, as well as satisfying this Unit 2 Surveillance Requirement. Seven exceptions are noted to the Unit 3 SRs of LCO 3.8.1. SR 3.8.1.8 is excepted when only one Unit 3 offsite circuit is required by the Unit 2 Specification, since there is not a second circuit to transfer to. SR 3.8.1.12, SR 3.8.1.13, SR 3.8.1.17, SR 3.8.1.18 (ECCS load block requirements only), and SR 3.8.1.19 are excepted since these SRs test the Unit 3 ECCS initiation signal, which is not needed for the AC sources to be OPERABLE on Unit 2. SR 3.8.1.20 is excepted since starting independence is not required with the DG(s) that is not required to be OPERABLE.

(continued)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.5 DC Sources—Shutdown

BASES

BACKGROUND A description of the DC sources is provided in the Bases for LCO 3.8.4, "DC Sources—Operating."

APPLICABLE SAFETY ANALYSES The initial conditions of Design Basis Accident and transient analyses in the UFSAR, Chapter 14 (Ref. 1), assume that Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the diesel generators (DGs), emergency auxiliaries, and control and switching during all MODES of operation.

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum DC electrical power sources during MODES 4 and 5 and during movement of irradiated fuel assemblies in secondary containment ensures that:

- a. The facility can be maintained in the shutdown or refueling condition for extended periods;
- b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and
- c. Adequate DC electrical power is provided to mitigate events postulated during shutdown, such as ~~an inadvertent draindown of the vessel or a~~ fuel handling accident.

The DC sources satisfy Criterion 3 of the NRC Policy Statement.

LCO The Unit 2 DC electrical power subsystems, with each DC subsystem consisting of two 125 V station batteries in series, two battery chargers (one per battery), and the corresponding control equipment and interconnecting cabling supplying power to the associated bus, are required to be

(continued)

BASES

LCO
(continued)

OPERABLE to support Unit 2 DC distribution subsystems required OPERABLE by LCO 3.8.8, "Distribution Systems—Shutdown." When the equipment required OPERABLE: 1) does not require 250 VDC from the DC electrical power subsystem; and 2) does not require 125 VDC from one of the two 125 V batteries of the DC electrical power subsystem, the Unit 2 DC electrical power subsystem requirements can be modified to only include one 125 V battery (the battery needed to provide power to required equipment), an associated battery charger, and the corresponding control equipment and interconnecting cabling supplying 125 V power to the associated bus. This exception is allowed only if all 250 VDC loads are removed from the associated bus. In addition, DC control power (which provides control power for the 4 kV load circuit breakers and the feeder breakers to the 4 kV emergency bus) for two of the four 4 kV emergency buses, as well as control power for two of the diesel generators, is provided by the Unit 3 DC electrical power subsystems. Therefore, the Unit 3 DC electrical power subsystems needed to support required components are also required to be OPERABLE. The Unit 3 DC electrical power subsystem OPERABILITY requirements are the same as those required for a Unit 2 DC electrical power subsystem. In addition, battery chargers (Unit 2 and Unit 3) can be powered from the opposite unit's AC source (as described in the Background section of the Bases for LCO 3.8.4, "DC Sources—Operating"), and be considered OPERABLE for the purpose of meeting this LCO.

This requirement ensures the availability of sufficient DC electrical power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents and inadvertent reactor vessel draindown).

APPLICABILITY

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

- core cooling** ↓
- a. Required features to provide ~~adequate coolant inventory makeup~~ are available for the irradiated fuel assemblies in the core in case of an inadvertent draindown of the reactor vessel;

(continued)

BASES

APPLICABILITY
(continued)

- b. Required features needed to mitigate a fuel handling accident are available;
- c. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and
- d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The DC electrical power requirements for MODES 1, 2, and 3 are covered in LCO 3.8.4.

ACTIONS

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

and

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

If more than one DC distribution subsystem is required according to LCO 3.8.8, the DC electrical power subsystems remaining OPERABLE with one or more DC electrical power subsystems inoperable may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS, fuel movement, and operations with a potential for draining the reactor vessel.

By allowance of the option to declare required features inoperable with associated DC electrical power subsystems inoperable, appropriate restrictions are implemented in accordance with the affected system LCOs' ACTIONS. However, in many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies in secondary containment, and any activities that could result in inadvertent draining of the reactor vessel).

(continued)

BASES

and

ACTIONS

~~A.1, A.2.1, A.2.2, A.2.3, and A.2.4~~ (continued)

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required DC electrical power subsystems and to continue this action until restoration is accomplished in order to provide the necessary DC electrical power to the plant safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required DC electrical power subsystems should be completed as quickly as possible in order to minimize the time during which the plant safety systems may be without sufficient power.

SURVEILLANCE
REQUIREMENTS

SR 3.8.5.1

SR 3.8.5.1 requires performance of all Surveillances required by SR 3.8.4.1 through SR 3.8.4.8. Therefore, see the corresponding Bases for LCO 3.8.4 for a discussion of each SR.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DC electrical power subsystems from being discharged below their capability to provide the required power supply or otherwise rendered inoperable during the performance of SRs. It is the intent that these SRs must still be capable of being met, but actual performance is not required.

SR 3.8.5.2

This Surveillance is provided to direct that the appropriate Surveillances for the required Unit 3 DC electrical power subsystems are governed by the Unit 3 Technical Specifications. Performance of the applicable Unit 3 Surveillances will satisfy Unit 3 requirements, as well as satisfying this Unit 2 Surveillance Requirement. The Frequency required by the applicable Unit 3 SR also governs performance of that SR for Unit 2.

(continued)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.8 Distribution Systems—Shutdown

BASES

BACKGROUND A description of the AC and DC electrical power distribution system is provided in the Bases for LCO 3.8.7, "Distribution Systems—Operating."

APPLICABLE SAFETY ANALYSES The initial conditions of Design Basis Accident and transient analyses in the UFSAR, Chapter 14 (Ref. 1), assume Engineered Safety Feature (ESF) systems are OPERABLE. The AC and DC electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the AC and DC electrical power distribution system is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum AC and DC electrical power sources and associated power distribution subsystems during MODES 4 and 5 and during movement of irradiated fuel assemblies in the secondary containment ensures that:

- a. The facility can be maintained in the shutdown or refueling condition for extended periods;
- b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and
- c. Adequate power is provided to mitigate events postulated during shutdown, such as ~~an inadvertent draindown of the vessel or~~ a fuel handling accident.

The AC and DC electrical power distribution systems satisfy Criterion 3 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO Various combinations of subsystems, equipment, and components are required OPERABLE by other LCOs, depending on the specific plant condition. Implicit in those requirements is the required OPERABILITY of necessary support required features. This LCO explicitly requires energization of the portions of the Unit 2 electrical distribution system necessary to support OPERABILITY of Technical Specifications required systems, equipment, and components—both specifically addressed by their own LCO, and implicitly required by the definition of OPERABILITY. In addition, some components that may be required by Unit 2 receive power through Unit 3 electrical power distribution subsystems (e.g., Standby Gas Treatment (SGT) System and DC control power for two of the four 4 kV emergency buses, as well as control power for two of the diesel generators). Therefore, Unit 3 AC and DC electrical power distribution subsystems needed to support the required equipment must also be OPERABLE.

In addition, it is acceptable for required buses to be cross-tied during shutdown conditions, permitting a single source to supply multiple redundant buses, provided the source is capable of maintaining proper frequency (if required) and voltage.

Maintaining these portions of the distribution system energized ensures the availability of sufficient power to operate the plant in a safe manner to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents ~~and inadvertent reactor vessel draindown~~).

APPLICABILITY The AC and DC electrical power distribution subsystems required to be OPERABLE in MODES 4 and 5 and during movement of irradiated fuel assemblies in the secondary containment provide assurance that:

- that provide core cooling**
- a. Systems ~~to provide adequate coolant inventory makeup are available for the irradiated fuel in the core in case of an inadvertent draindown of the reactor vessel;~~
 - b. Systems needed to mitigate a fuel handling accident are available;

(continued)

BASES

APPLICABILITY
(continued)

- c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and
- d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC and DC electrical power distribution subsystem requirements for MODES 1, 2, and 3 are covered in LCO 3.8.7.

ACTIONS

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

and

A.1, A.2.1, A.2.2, A.2.3, A.2.4, and A.2.5

and

Although redundant required features may require redundant electrical power distribution subsystems to be OPERABLE, one OPERABLE distribution subsystem may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS, fuel movement, and operations with a potential for draining the reactor vessel. By allowing the option to declare required features inoperable with associated electrical power distribution subsystems inoperable, appropriate restrictions are implemented in accordance with the affected distribution subsystem LCO's Required Actions. However, in many instances this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made, (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies in the secondary containment, and any activities that could result in inadvertent draining of the reactor vessel).

and

(continued)

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4, and ~~A.2.5~~ (continued)

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC and DC electrical power distribution subsystems and to continue this action until restoration is accomplished in order to provide the necessary power to the plant safety systems.

Notwithstanding performance of the above conservative Required Actions, a required residual heat removal-shutdown cooling (RHR-SDC) subsystem may be inoperable. In this case, Required Actions A.2.1 through A.2.4 do not adequately address the concerns relating to coolant circulation and heat removal. Pursuant to LCO 3.0.6, the RHR-SDC ACTIONS would not be entered. Therefore, Required Action A.2.5 is provided to direct declaring RHR-SDC inoperable, which results in taking the appropriate RHR-SDC ACTIONS.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required electrical power distribution subsystems should be completed as quickly as possible in order to minimize the time the plant safety systems may be without power.

SURVEILLANCE
REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the AC and DC electrical power distribution subsystem is functioning properly, with the buses energized. The verification of indicated power availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. This may be performed by verification of absence of low voltage alarms. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapter 14.

BASES	unlikely	any	that could result in draining of the RPV
APPLICABLE SAFETY ANALYSES (continued)	<p>In the event of a large primary system leak, the reactor vessel would rapidly depressurize, allowing the low pressure core cooling systems to operate. The capability of the low pressure coolant injection and core spray subsystems, as required in MODE 4 by LCO 3.5.2, "ECCS Shutdown," would be more than adequate to keep the core flooded under this low decay heat load condition. Small system leaks would be detected by leakage inspections before significant inventory loss occurred.</p>		
	makeup	RPV water level above TAF	"RPV Water Inventory Control,"
		4	
	<p>For the purposes of this test, the protection provided normally required MODE 4 applicable LCOs, in addition secondary containment requirements required to be met by this Special Operations LCO, will ensure acceptable consequences during normal hydrostatic test conditions and during postulated accident conditions.</p>		
	<p>As described in LCO 3.0.7, compliance with Special Operations LCOs is optional, and therefore, no criteria of the NRC Policy Statement apply. Special Operations LCOs provide flexibility to perform certain operations by appropriately modifying requirements of other LCOs. A discussion of the criteria satisfied for the other LCOs is provided in their respective Bases.</p>		
LCO	<p>As described in LCO 3.0.7, compliance with this Special Operations LCO is optional. Operation at reactor coolant temperatures > 212°F can be in accordance with Table 1.1-1 for MODE 3 operation without meeting this Special Operations LCO or its ACTIONS. This option may be required due to P/T limits, however, which require testing at temperatures > 212°F, while the ASME inservice test itself requires the safety/relief valves to be gagged, preventing their OPERABILITY. Additionally, even with required minimum reactor coolant temperatures < 212°F, RCS temperatures may drift above 212°F during the performance of inservice leak and hydrostatic testing or during subsequent control rod scram time testing, which is typically performed in conjunction with inservice leak and hydrostatic testing. While this Special Operations LCO is provided for inservice leak and hydrostatic testing, and for scram time testing initiated in conjunction with an inservice leak or hydrostatic test, parallel performance of others tests and inspections is not precluded.</p>		
	(continued)		

TABLE OF CONTENTS

B 2.0	SAFETY LIMITS (SLs)	B 2.0-1
B 2.1.1	Reactor Core SLs	B 2.0-1
B 2.1.2	Reactor Coolant System (RCS) Pressure SL	B 2.0-7
B 3.0	LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY	B 3.0-1
B 3.0	SURVEILLANCE REQUIREMENT (SR) APPLICABILITY	B 3.0-10
B 3.1	REACTIVITY CONTROL SYSTEMS	B 3.1-1
B 3.1.1	SHUTDOWN MARGIN (SDM)	B 3.1-1
B 3.1.2	Reactivity Anomalies	B 3.1-8
B 3.1.3	Control Rod OPERABILITY	B 3.1-13
B 3.1.4	Control Rod Scram Times	B 3.1-22
B 3.1.5	Control Rod Scram Accumulators	B 3.1-29
B 3.1.6	Rod Pattern Control	B 3.1-34
B 3.1.7	Standby Liquid Control (SLC) System	B 3.1-39
B 3.1.8	Scram Discharge Volume (SDV) Vent and Drain Valves ..	B 3.1-48
B 3.2	POWER DISTRIBUTION LIMITS	B 3.2-1
B 3.2.1	AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)	B 3.2-1
B 3.2.2	MINIMUM CRITICAL POWER RATIO (MCPR)	B 3.2-6
B 3.2.3	LINEAR HEAT GENERATION RATE (LHGR)	B 3.2-11
B 3.3	INSTRUMENTATION	B 3.3-1
B 3.3.1.1	Reactor Protection System (RPS) Instrumentation	B 3.3-1
B 3.3.1.2	Wide Range Neutron Monitor (WRNM) Instrumentation	B 3.3-37
B 3.3.2.1	Control Rod Block Instrumentation	B 3.3-46
B 3.3.2.2	Feedwater and Main Turbine High Water Level Trip Instrumentation	B 3.3-59
B 3.3.3.1	Post Accident Monitoring (PAM) Instrumentation	B 3.3-66
B 3.3.3.2	Remote Shutdown System	B 3.3-77
B 3.3.4.1	Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation	B 3.3-84
B 3.3.4.2	End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation . . .	B 3.3-92a thru B 3.3-92j
B 3.3.5.1	Emergency Core Cooling System (ECCS) Instrumentation	B 3.3-93
B 3.3.5.2	Reactor Core Isolation Cooling (RCIC) System Instrumentation	B 3.3-131
B 3.3.5.3	Not used	B 3.3-140a
B 3.3.5.4	Reactor Pressure Vessel (RPV) Water Inventory Control	B 3.3-141b
B 3.3.6.1	Primary Containment Isolation Instrumentation	B 3.3-142
B 3.3.6.2	Secondary Containment Isolation Instrumentation	B 3.3-169
B 3.3.7.1	Main Control Room Emergency Ventilation (MCREV) System Instrumentation	B 3.3-180
B 3.3.8.1	Loss of Power (LOP) Instrumentation	B 3.3-187
B 3.3.8.2	Reactor Protection System (RPS) Electric Power Monitoring	B 3.3-199

(continued)

TABLE OF CONTENTS (continued)

B 3.4	REACTOR COOLANT SYSTEM (RCS)	B 3.4-1
B 3.4.1	Recirculation Loops Operating	B 3.4-1
B 3.4.2	Jet Pumps	B 3.4-11
B 3.4.3	Safety Relief Valves (SRVs) and Safety Valves (SVs) ..	B 3.4-15
B 3.4.4	RCS Operational LEAKAGE	B 3.4-19
B 3.4.5	RCS Leakage Detection Instrumentation	B 3.4-24
B 3.4.6	RCS Specific Activity	B 3.4-29
B 3.4.7	Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown	B 3.4-33
B 3.4.8	Residual Heat Removal (RHR) Shutdown Cooling System—Cold Shutdown	B 3.4-38
B 3.4.9	RCS Pressure and Temperature (P/T) Limits	B 3.4-43
B 3.4.10	Reactor Steam Dome Pressure	B 3.4-52
B 3.5	EMERGENCY CORE COOLING SYSTEMS (ECCS), RPV WATER INVENTORY CONTROL (WIC), AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM	B 3.5-1
B 3.5.1	ECCS—Operating	B 3.5-1
B 3.5.2	ECCS—Shutdown	B 3.5-18
B 3.5.3	RCIC System	B 3.5-24
B 3.5.4	RPV Water Inventory Control	B 3.5-25
B 3.6	CONTAINMENT SYSTEMS	B 3.6-1
B 3.6.1.1	Primary Containment	B 3.6-1
B 3.6.1.2	Primary Containment Air Lock	B 3.6-6
B 3.6.1.3	Primary Containment Isolation Valves (PCIVs)	B 3.6-14
B 3.6.1.4	Drywell Air Temperature	B 3.6-31
B 3.6.1.5	Reactor Building-to-Suppression Chamber Vacuum Breakers	B 3.6-34
B 3.6.1.6	Suppression Chamber-to-Drywell Vacuum Breakers	B 3.6-42
B 3.6.2.1	Suppression Pool Average Temperature	B 3.6-48
B 3.6.2.2	Suppression Pool Water Level	B 3.6-53
B 3.6.2.3	Residual Heat Removal (RHR) Suppression Pool Cooling	B 3.6-56
B 3.6.2.4	Residual Heat Removal (RHR) Suppression Pool Spray	B 3.6-60
B 3.6.3.1	Containment Atmospheric Dilution (CAD) System	B 3.6-64
B 3.6.3.2	Primary Containment Oxygen Concentration	B 3.6-70
B 3.6.4.1	Secondary Containment	B 3.6-73
B 3.6.4.2	Secondary Containment Isolation Valves (SCIVs)	B 3.6-78
B 3.6.4.3	Standby Gas Treatment (SGT) System	B 3.6-85
B 3.7	PLANT SYSTEMS	B 3.7-1
B 3.7.1	High Pressure Service Water (HPSW) System	B 3.7-1
B 3.7.2	Emergency Service Water (ESW) System and Normal Heat Sink	B 3.7-6
B 3.7.3	Emergency Heat Sink	B 3.7-11
B 3.7.4	Main Control Room Emergency Ventilation (MCREV) System	B 3.7-15
B 3.7.5	Main Condenser Offgas	B 3.7-22

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY
(continued)

with their setpoints within the specified Allowable Values, where appropriate. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. Table 3.3.5.1-1 is modified by ~~two~~ footnotes. ~~Footnote (a) is added to clarify that the associated functions are required to be OPERABLE in MODES 4 and 5 only when their supported ECCS are required to be OPERABLE per LCO 3.5.2, ECCS Shutdown. Footnote (b) is added to show that certain ECCS instrumentation Functions also perform DG initiation.~~

Allowable Values are specified for each ECCS Function specified in the Table. Trip setpoints are specified in the setpoint calculations. The trip setpoints are selected to ensure that the settings do not exceed the Allowable Value between CHANNEL CALIBRATIONS. Operation with a trip setting less conservative than the trip setpoint, but within its Allowable Value, is acceptable. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel water level), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic or design limits are derived from the limiting values of the process parameters obtained from the safety analysis or other appropriate documents. The Allowable Values are derived from the analytic or design limits, corrected for calibration, process, and instrument errors. The trip setpoints are determined from analytical or design limits, corrected for calibration, process, and instrument errors, as well as, instrument drift. In selected cases, the Allowable Values and trip setpoints are determined from engineering judgement or historically accepted practice relative to the intended functions of the channel. The trip setpoints determined in this manner provide adequate protection by assuming instrument and process uncertainties expected for the environments during the operating time of the associated channels are accounted for. For the Core Spray and LPCI Pump Start-Time Delay Relays, adequate margins for applicable setpoint methodologies are incorporated into the Allowable Values and actual setpoints.

In general, the individual Functions are required to be OPERABLE in the MODES or other specified conditions that may require ECCS (or DG) initiation to mitigate the consequences of a design basis transient or accident. To ensure reliable ECCS and DG function, a combination of Functions is required to provide primary and secondary initiation signals.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

1.a. 2.a. Reactor Vessel Water Level—Low Low Low (Level 1)
(continued)

~~initiation. Per Footnote (a) to Table 3.3.5.1 1, this ECCS Function is only required to be OPERABLE in MODES 4 and 5 whenever the associated ECCS is required to be OPERABLE per LCO 3.5.2. Refer to LCO 3.5.1 and LCO 3.5.2, "ECCS Shutdown," for Applicability Bases for the low pressure ECCS subsystems; LCO 3.8.1, "AC Sources Operating"; and LCO 3.8.2, "AC Sources Shutdown," for Applicability Bases for the DGs.~~

1.b. 2.b. Drywell Pressure—High

High pressure in the drywell could indicate a break in the reactor coolant pressure boundary (RCPB). The low pressure ECCS and associated DGs are initiated upon receipt of the Drywell Pressure—High Function with a Reactor Pressure—Low (Injection Permissive) in order to minimize the possibility of fuel damage. The DGs are initiated from Function 1.b signals. This Function also initiates the closure of the recirculation discharge valves to ensure the LPCI subsystems inject into the proper RPV location. The Drywell Pressure—High Function with a Reactor Pressure—Low (Injection Permissive), along with the Reactor Water Level—Low Low Low (Level 1) 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 and be indicative of a LOCA inside primary containment.

The Drywell Pressure—High Function is required to be OPERABLE when the ECCS or DG is required to be OPERABLE in conjunction with times when the primary containment is required to be OPERABLE. Thus, four channels of the CS and LPCI Drywell Pressure—High Function are required to be OPERABLE in MODES 1, 2, and 3 to ensure that no single instrument failure can preclude ECCS and DG initiation. In MODES 4 and 5, the Drywell Pressure—High Function is not required, since there is insufficient energy in the reactor to pressurize the primary containment to Drywell Pressure—High setpoint. Refer to LCO 3.5.1 for Applicability Bases for the low pressure ECCS subsystems and to LCO 3.8.1 for Applicability Bases for the DGs.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY
(continued)

1.c, 2.c. Reactor Pressure-Low (Injection Permissive)

Low reactor pressure signals are used as permissives for the low pressure ECCS subsystems. This ensures that, prior to opening the injection valves of the low pressure ECCS subsystems or initiating the low pressure ECCS subsystems on a Drywell Pressure-High signal, the reactor pressure has fallen to a value below these subsystems' maximum design pressure and a break inside the RCPB has occurred respectively. This Function also provides permissive for the closure of the recirculation discharge valves to ensure the LPCI subsystems inject into the proper RPV location. The Reactor Pressure-Low is one of the Functions assumed to be OPERABLE and capable of permitting initiation of the ECCS during the transients analyzed in References 1 and 3. In addition, the Reactor Pressure-Low 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.

The Reactor Pressure-Low signals are initiated from four pressure transmitters that sense the reactor dome pressure.

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

Four channels of Reactor Pressure-Low Function are only required to be OPERABLE when the ECCS is required to be OPERABLE to ensure that no single instrument failure can preclude ECCS initiation. ~~Per footnote (a) to Table 3.3.5.1 1, this ECCS Function is only required to be OPERABLE in MODES 4 and 5 whenever the associated ECCS is required to be OPERABLE per LCO 3.5.2. Refer to LCO 3.5.1 and LCO 3.5.2 for Applicability Bases for the low pressure ECCS subsystems.~~

1.d, 2.g. Core Spray and Low Pressure Coolant Injection Pump Discharge Flow-Low (Bypass)

The minimum flow instruments are provided to protect the associated low pressure ECCS pump from overheating when the pump is operating and the associated injection valve is not fully open. The minimum flow line valve is opened when low flow is sensed, and the valve is automatically closed when the flow rate is adequate to protect the pump. The LPCI and

(continued)

BASES

APPLICABLE
SAFETY ANALYSES
LCO, and
APPLICABILITY

1.d, 2.g. Core Spray and Low Pressure Coolant Injection
Pump Discharge Flow-Low (Bypass) (continued)

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

One differential pressure switch per ECCS pump is used to detect the associated subsystems' flow rates. The logic is arranged such that each switch causes its associated minimum flow valve to open. The logic will close the minimum flow valve once the closure setpoint is exceeded. The LPCI minimum flow valves are time delayed such that the valves will not open for 10 seconds after the switches detect low flow. The time delay is provided to limit reactor vessel inventory loss during the startup of the RHR shutdown cooling mode. The Pump Discharge Flow-Low Allowable Values are high enough to ensure that the pump flow rate is sufficient to protect the pump, yet low enough to ensure that the closure of the minimum flow valve is initiated to allow full flow into the core.

Each channel of Pump Discharge Flow-Low Function (four CS channels and four LPCI channels) is only required to be OPERABLE when the associated ECCS is required to be OPERABLE to ensure that no single instrument failure can preclude the ECCS function. ~~Per footnote (a) to Table 3.3.5.1 1, this ECCS Function is only required to be OPERABLE in MODES 4 and 5 whenever the associated ECCS is required to be OPERABLE per LCO 3.5.2. Refer to LCO 3.5.1 and LCO 3.5.2 for Applicability Bases for the low pressure ECCS subsystems.~~

1.e, 1.f. Core Spray Pump Start-Time Delay Relay

The purpose of this time delay is to stagger the start of the CS pumps that are in each of Divisions I and II to prevent overloading the power source. This Function is necessary when power is being supplied from the offsite sources or the standby power sources (DG). The CS Pump Start-Time Delay Relays are assumed to be OPERABLE in the accident and transient analyses requiring ECCS initiation. That is, the analyses assume that the pumps will initiate when required and excess loading will not cause failure of the power sources.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

1.e, 1.f. Core Spray Pump Start-Time Delay Relay
(continued)

There are eight Core Spray Pump Start-Time Delay Relays, two in each of the CS pump start logic circuits (one for when offsite power is available and one for when offsite power is not available). One of each type of time delay relay is dedicated to a single pump start logic, such that a single failure of a Core Spray Pump Start-Time Delay Relay will not result in the failure of more than one CS pump. In this condition, three of the four CS pumps will remain OPERABLE; thus, the single failure criterion is met (i.e., loss of one instrument does not preclude ECCS initiation). The Allowable Value for the Core Spray Pump Start-Time Delay Relays is chosen to be long enough so that the power source will not be overloaded and short enough so that ECCS operation is not degraded.

Each channel of Core Spray Pump Start-Time Delay Relay Function is required to be OPERABLE only when the associated CS subsystem is required to be OPERABLE. ~~Per footnote (a) to Table 3.3.5.1-1, this ECCS Function is only required to be OPERABLE in MODES 4 and 5 whenever the associated ECCS is required to be OPERABLE per LCO 3.5.2. Refer to LCO 3.5.1 and LCO 3.5.2 for Applicability Bases for the CS subsystems.~~

2.d. Reactor Pressure-Low Low (Recirculation Discharge Valve Permissive)

Low reactor pressure signals are used as permissives for recirculation discharge valve closure. This ensures that the LPCI subsystems inject into the proper RPV location assumed in the safety analysis. The Reactor Pressure-Low Low is one of the Functions assumed to be OPERABLE and capable of closing the valve during the transients analyzed in References 1 and 3. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46. The Reactor Pressure-Low Low Function is directly assumed in the analysis of the recirculation line break (Ref. 4).

The Reactor Pressure-Low Low signals are initiated from four pressure transmitters that sense the reactor pressure.

The Allowable Value is chosen to ensure that the valves close prior to commencement of LPCI injection flow into the core, as assumed in the safety analysis.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

2.e. Reactor Vessel Shroud Level—Level 0 (continued)

Two channels of the Reactor Vessel Shroud Level—Level 0 Function are only required to be OPERABLE in MODES 1, 2, and 3. In MODES 4 and 5, the specified initiation time of the LPCI subsystems is not assumed, and other administrative controls are adequate to control the valves associated with this Function (since the systems that the valves are opened for are not required to be OPERABLE in MODES 4 and 5 and are normally not used).

2.f. Low Pressure Coolant Injection Pump Start—Time Delay Relay

The purpose of this time delay is to stagger the start of the LPCI pumps that are in each of Divisions I and II, to prevent overloading the power source. This Function is only necessary when power is being supplied from offsite sources. The LPCI pumps start simultaneously with no time delay as soon as the standby source is available. The LPCI Pump Start—Time Delay Relays are assumed to be OPERABLE in the accident and transient analyses requiring ECCS initiation. That is, the analyses assume that the pumps will initiate when required and excess loading will not cause failure of the power sources.

There are eight LPCI Pump Start—Time Delay Relays, two in each of the RHR pump start logic circuits. Two time delay relays are dedicated to a single pump start logic. Both timers in the RHR pump start logic would have to fail to prevent an RHR pump from starting within the required time; therefore, the low pressure ECCS pumps will remain OPERABLE; thus, the single failure criterion is met (i.e., loss of one instrument does not preclude ECCS initiation). The Allowable Values for the LPCI Pump Start—Time Delay Relays are chosen to be long enough so that most of the starting transient of the first pump is complete before starting the second pump on the same 4 kV emergency bus and short enough so that ECCS operation is not degraded.

Each channel of LPCI Pump Start—Time Delay Relay Function is required to be OPERABLE only when the associated LPCI subsystem is required to be OPERABLE. ~~Per footnote (a) to Table 3.3.5.1-1, this ECCS Function is only required to be OPERABLE in MODES 4 and 5 whenever the associated ECCS is required to be OPERABLE per LCO 3.5.2. Refer to LCO 3.5.1 and LCO 3.5.2 for Applicability Bases for the LPCI subsystems.~~

(continued)

BASES

ACTIONS
 (continued)

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

Required Actions B.1 and B.2 are intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in redundant automatic initiation capability being lost for the feature(s). Required Action B.1 features would be those that are initiated by Functions 1.a, 1.b, 2.a, and 2.b (e.g., low pressure ECCS). The Required Action B.2 system would be HPCI. For Required Action B.1, redundant automatic initiation capability is lost if (a) two or more Function 1.a channels are inoperable and untripped such that both trip systems lose initiation capability, (b) two or more Function 2.a channels are inoperable and untripped such that both trip systems lose initiation capability, (c) two or more Function 1.b channels are inoperable and untripped such that both trip systems lose initiation capability, or (d) two or more Function 2.b channels are inoperable and untripped such that both trip systems lose initiation capability. For low pressure ECCS, since each inoperable channel would have Required Action B.1 applied separately (refer to ACTIONS Note), each inoperable channel would only require the affected portion of the associated system of low pressure ECCS and DGs to be declared inoperable. However, since channels in both associated low pressure ECCS subsystems (e.g., both CS subsystems) are inoperable and untripped, and the Completion Times started concurrently for the channels in both subsystems, this results in the affected portions in the associated low pressure ECCS and DGs being concurrently declared inoperable.

For Required Action B.2, redundant automatic HPCI initiation capability is lost if two or more Function 3.a or two Function 3.b channels are inoperable and untripped such that the trip system loses initiation capability. In this situation (loss of redundant automatic initiation capability), the 24 hour allowance of Required Action B.3 is not appropriate and the HPCI System must be declared inoperable within 1 hour. ~~As noted (Note 1 to Required Action B.1), Required Action B.1 is only applicable in MODES 1, 2, and 3. In MODES 4 and 5, the specific initiation time of the low pressure ECCS is not assumed and the probability of a LOCA is lower. Thus, a total loss of~~

(continued)

BASES

ACTIONS

B.1, B.2, and B.3 (continued)

~~initiation capability for 24 hours (as allowed by Required Action B.3) is allowed during MODES 4 and 5. There is no similar Note provided for Required Action B.2 since HPCI instrumentation is not required in MODES 4 and 5; thus, a Note is not necessary.~~

Notes are also provided (Note 2 to Required Action B.1 and the Note to Required Action B.2) to delineate which Required Action is applicable for each Function that requires entry into Condition B if an associated channel is inoperable. This ensures that the proper loss of initiation capability check is performed. Required Action B.1 (the Required Action for certain inoperable channels in the low pressure ECCS subsystems) is not applicable to Function 2.e, since this Function provides backup to administrative controls ensuring that operators do not divert LPCI flow from injecting into the core when needed. Thus, a total loss of Function 2.e capability for 24 hours is allowed, since the LPCI subsystems remain capable of performing their intended function.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action B.1, the Completion Time only begins upon discovery that a redundant feature in the same system (e.g., both CS subsystems) cannot be automatically initiated due to inoperable, untripped channels within the same Function as described in the paragraph above. For Required Action B.2, the Completion Time only begins upon discovery that the HPCI System cannot be automatically initiated due to two inoperable, untripped channels for the associated Function in the same trip system. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 5) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the


(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

concurrently declared inoperable. For Functions 1.c, 1.e, 1.f, 2.c, 2.d, and 2.f, the affected portions are the associated low pressure ECCS pumps. ~~As noted (Note 1), Required Action C.1 is only applicable in MODES 1, 2, and 3. In MODES 4 and 5, the specific initiation time of the ECCS is not assumed and the probability of a LOCA is lower. Thus, a total loss of automatic initiation capability for 24 hours (as allowed by Required Action C.2) is allowed during MODES 4 and 5.~~

 Note 2 states that Required Action C.1 is only applicable for Functions 1.c, 1.e, 1.f, 2.c, 2.d, and 2.f. Required Action C.1 is not applicable to Function 3.c (which also requires entry into this Condition if a channel in this Function is inoperable), since the loss of one channel results in a loss of the Function (two-out-of-two logic). This loss was considered during the development of Reference 5 and considered acceptable for the 24 hours allowed by Required Action C.2.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action C.1, the Completion Time only begins upon discovery that the same feature in both subsystems (e.g., both CS subsystems) cannot be automatically initiated due to inoperable channels within the same Function as described in the paragraph above. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration of channels.

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 5) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, Condition H must be entered and its Required Action taken. The Required Actions do not allow placing the channel in trip since this action would either cause the initiation or it would not necessarily result in a safe state for the channel in all events.

(continued)

BASES

ACTIONS

D.1, D.2.1, and D.2.2 (continued)

pipng remains filled with water. Alternately, if it is not desired to perform Required Actions D.2.1 and D.2.2 (e.g., as in the case where shifting the suction source could drain down the HPCI suction piping), Condition H must be entered and its Required Action taken.

E.1 and E.2

Required Action E.1 is intended to ensure that appropriate actions are taken if multiple, inoperable channels within the Core Spray and Low Pressure Coolant Injection Pump, Discharge Flow - Low (Bypass) Functions result in redundant automatic initiation capability being lost for the feature(s). For Required Action E.1, the features would be those that are initiated by Functions 1.d and 2.g (e.g., low pressure ECCS). Redundant automatic initiation capability is lost if (a) two or more Function 1.d channels are inoperable affecting CS pumps in different subsystems or (b) three or more Function 2.g channels are inoperable. Since each inoperable channel would have Required Action E.1 applied separately (refer to ACTIONS Note), each inoperable channel would only require the affected low pressure ECCS pump to be declared inoperable. However, since channels for more than one low pressure ECCS pump are inoperable, and the Completion Times started concurrently for the channels of the low pressure ECCS pumps, this results in the affected low pressure ECCS pumps being concurrently declared inoperable.

In this situation (loss of redundant automatic initiation capability), the 7 day allowance of Required Action E.2 is not appropriate and the subsystem associated with each inoperable channel must be declared inoperable within 1 hour. ~~As noted (Note 1 to Required Action E.1), Required Action E.1 is only applicable in MODES 1, 2, and 3. In MODES 4 and 5, the specific initiation time of the ECCS is not assumed and the probability of a LOCA is lower. Thus, a total loss of initiation capability for 7 days (as allowed by Required Action E.2) is allowed during MODES 4 and 5. A~~ Note is also provided (Note 2 to Required Action E.1) to delineate that Required Action E.1 is only applicable to low

(continued)

New PBAPS TS Bases Section 3.3.5.3

B 3.3.5.3

B 3.3 INSTRUMENTATION

B 3.3.5.3 Not Used

B 3.3 INSTRUMENTATION

B 3.3.5.4 Reactor Pressure Vessel (RPV) Water Inventory Control
Instrumentation

BASES

BACKGROUND

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

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

With the unit in MODE 4 or 5, RPV water inventory control is not required to mitigate any events or accidents evaluated in the safety analyses. RPV water inventory control is required in MODES 4 and 5 to protect Safety Limit 2.1.1.3 and the fuel cladding barrier to prevent the release of radioactive material should a draining event occur. Under the definition of DRAIN TIME, some penetration flow paths may be excluded from the DRAIN TIME calculation if they will be isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to the TAF when actuated by RPV water level isolation instrumentation.

(continued)

BASES (continued)

BACKGROUND
(continued)

The purpose of the RPV Water Inventory Control Instrumentation is to support the requirements of LCO 3.5.4, "Reactor Pressure Vessel (RPV) Water Inventory Control," and the definition of DRAIN TIME. There are functions that are required for manual initiation or operation of the ECCS injection/spray subsystem required to be OPERABLE by LCO 3.5.4 and other functions that support automatic isolation of Residual Heat Removal subsystem and Reactor Water Cleanup system penetration flow path(s) on low RPV water level.

The RPV Water Inventory Control Instrumentation supports operation of core spray (CS) and low pressure coolant injection (LPCI). The equipment involved with each of these systems is described in the Bases for LCO 3.5.4.

APPLICABLE
SAFETY ANALYSIS

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

A double-ended guillotine break of the Reactor Coolant System (RCS) is not postulated in MODES 4 and 5 due to the reduced RCS pressure, reduced piping stresses, and ductile piping systems. Instead, an event is postulated in which a single operator error or initiating event allows draining of the RPV water inventory through a single penetration flow path with the highest flow rate, or the sum of the drain rates through multiple penetration flow paths susceptible to a common mode failure (e.g., seismic event (except when the risk is assessed and managed in accordance with TS LCO 3.0.8), loss of normal power, single human error). It is assumed, based on engineering judgment, that while in MODES 4 and 5, one low pressure ECCS injection/spray subsystem can be manually initiated to maintain adequate reactor vessel water level.

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

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

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

(continued)

BASES (continued)

APPLICABLE
SAFETY ANALYSES
(continued)

Function basis.

Core Spray and Low Pressure Coolant Injection Systems

1.a, 2.a. Reactor Pressure - Low (Injection Permissive)

Low reactor pressure signals are used as permissives for the low pressure ECCS injection/spray subsystem manual injection functions. This function ensures that, prior to opening the injection valves of the low pressure ECCS subsystems, the reactor pressure has fallen to a value below these subsystems' maximum design pressure. While it is assured during MODES 4 and 5 that the reactor pressure will be below the ECCS maximum design pressure, the Reactor Pressure - Low signals are assumed to be OPERABLE and capable of permitting initiation of the ECCS.

The Reactor Pressure - Low signals are initiated from four pressure transmitters that sense the reactor dome pressure.

The Allowable Value is low enough to prevent overpressuring the equipment in the low pressure ECCS.

The four channels of Reactor Pressure - Low Function are required to be OPERABLE in MODES 4 and 5 when ECCS manual initiation is required to be OPERABLE by LCO 3.5.4.

1.b, 2.b. Core Spray and Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)

The minimum flow instruments are provided to protect the associated low pressure ECCS pump from overheating when the pump is operating and the associated injection valve is not fully open. The minimum flow line valve is opened when low flow is sensed, and the valve is automatically closed when the flow rate is adequate to protect the pump.

One differential pressure switch per ECCS pump is used to detect the associated subsystems' flow rates. The logic is arranged such that each transmitter causes its associated minimum flow valve to open. The logic will close the minimum flow valve once the closure setpoint is exceeded. The LPCI minimum flow valves are time delayed such that the valves will not open for 10 seconds after the switches detect low flow. The time delay is provided to limit reactor vessel inventory loss during the startup of the Residual Heat Removal (RHR) shutdown cooling mode.

(continued)

BASES (continued)

APPLICABLE
SAFETY ANALYSES
(continued)

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

One channel of the Pump Discharge Flow - Low Function is required to be OPERABLE in MODES 4 and 5 when the associated Core Spray or LPCI pump is required to be OPERABLE by LCO 3.5.4 to ensure the pumps are capable of injecting into the Reactor Pressure Vessel when manually initiated.

A note is added to TS Table 3.3.5.4-1 for Function 2.b to clarify the intent of allowing credit for an OPERABLE Low Pressure Coolant Injection subsystem when it is aligned and operating in the decay heat removal mode of RHR. This note is appropriate since the associated RHR pump minimum flow valve (while operating in the decay heat removal mode) is closed and deactivated to prevent inadvertent vessel drain down events.

1.c, 2.c. Manual Initiation

The Manual Initiation channels consist of pump start hand switches that introduce signals into the appropriate ECCS logic to provide manual initiation capability. There is one hand switch for each of the pumps required for the CS and LPCI subsystems.

There is no allowable value for this Function since the channels are mechanically actuated based solely on the position of the hand switches. A channel of the Manual Initiation Function (one channel per required pump) is required to be OPERABLE in Modes 4 and 5 when the associated ECCS subsystems are required to be OPERABLE per LCO 3.5.4.

RHR System Isolation

3.a Reactor Vessel Water Level - Low, Level 3

The definition of DRAIN TIME allows crediting the closing of penetration flow paths that are capable of being isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to the TAF when actuated by RPV water level isolation instrumentation. The

Reactor Vessel Water Level - Low, Level 3 Function associated with RHR System isolation may be credited for automatic isolation of penetration flow paths associated with the RHR System.

(continued)

BASES (continued)

APPLICABLE
SAFETY ANALYSES
(continued)

Reactor Vessel Water Level - Low, Level 3 signals are Reactor 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. While four channels (two channels per trip system) of the Reactor Vessel Water Level - Low, Level 3 Function are available, only two channels (all in the same trip system) are required to be OPERABLE.

The Reactor Vessel Water Level - Low, Level 3 Allowable Value was chosen to be the same as the Primary Containment Isolation Instrumentation Reactor Vessel Water Level - Low, Level 3 Allowable Value (LCO 3.3.6.1), since the capability to cool the fuel may be threatened.

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

Reactor Water Cleanup (RWCU) System Isolation

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

The definition of DRAIN TIME allows crediting the closing of penetration flow paths that are capable of being isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to the TAF when actuated by RPV water level isolation instrumentation. The Reactor Vessel Water Level - Low, Level 3 Function associated with RWCU System isolation may be credited for automatic isolation of penetration flow paths associated with the RWCU System.

Reactor Vessel Water Level - Low, Level 3 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. While four channels (two channels per trip system) of the Reactor Vessel Water Level - Low, Level 3 Function are available, only two channels (all in the same trip system) are required to be OPERABLE.

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

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES (continued) This Function isolates the inboard and outboard RWCU pump suction penetration and the outboard valve at the RWCU connection to reactor feedwater.

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

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

A.1

Required Action A.1 directs entry into the appropriate Condition referenced in Table 3.3.5.4-1. The applicable Condition referenced in the Table is Function dependent. Each time a channel is discovered inoperable, Condition A is entered for that channel and provides for transfer to the appropriate subsequent Condition.

B.1 and B.2

RHR System Isolation, Reactor Vessel Water Level - Low, Level 3, and Reactor Water Cleanup System Isolation, Reactor Vessel Water Level - Low, Level 3 functions are applicable when automatic isolation of the associated penetration flow path is credited in calculating DRAIN TIME. If the instrumentation is inoperable, Required Action B.1 directs an immediate declaration that the associated penetration flow path(s) are incapable of automatic isolation. Required Action B.2 directs calculation of DRAIN TIME. The calculation cannot credit automatic isolation of the affected penetration flow paths.

(continued)

BASES (continued)

ACTIONS
(continued)

C.1

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

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

D.1

If a Core Spray or Low Pressure Coolant Injection Pump Discharge Flow - Low bypass function is inoperable, there is a risk that the associated low pressure ECCS pump could overheat when the pump is operating and the associated injection valve is not fully open. In this condition, the operator can take manual control of the pump and the injection valve to ensure the pump does not overheat. If a manual initiation function is inoperable, the ECCS subsystem pumps can be started manually and the valves can be opened manually, but this is not the preferred condition.

The 24 hour Completion Time was chosen to allow time for the operator to evaluate and repair any discovered inoperabilities. The Completion Time is appropriate given the ability to manually start the ECCS pumps and open the injection valves and to manually ensure the pump does not overheat.

E.1

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

As noted in the beginning of the SRs, the SRs for each RPV Water Inventory Control instrument Function are found in the SRs column of Table 3.3.5.4-1.

(continued)

BASES (continued)

SURVEILLANCE
REQUIREMENTS

SR 3.3.5.4.1

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

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

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

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

SR 3.3.5.4.2

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

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

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

(continued)

BASES (continued)

SURVEILLANCE
REQUIREMENTS
(continued)

SR 3.3.5.4.3

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.4 overlaps this Surveillance to complete testing of the assumed safety function.

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

REFERENCES

1. Information Notice 84-81 "Inadvertent Reduction in Primary Coolant Inventory in Boiling Water Reactors During Shutdown and Startup," November 1984.
2. Information Notice 86-74, "Reduction of Reactor Coolant Inventory Because of Misalignment of RHR Valves," August 1986.
3. Generic Letter 92-04, "Resolution of the Issues Related to Reactor Vessel Water Level Instrumentation in BWRs Pursuant to 10 CFR 50.54(F)," August 1992.
4. NRC Bulletin 93-03, "Resolution of Issues Related to Reactor Vessel Water Level Instrumentation in BWRs," May 1993.
5. Information Notice 94-52, "Inadvertent Containment Spray and Reactor Vessel Draindown at Millstone 1," July 1994.

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

6.a. Reactor Pressure-High (continued)

MODES 1, 2, and 3, since these are the only MODES in which the reactor can be pressurized; thus, equipment protection is needed. The Allowable Value was chosen to be low enough to protect the system equipment from overpressurization.

This Function isolates both RHR shutdown cooling pump suction valves.

6.b. Reactor Vessel Water Level-Low (Level 3)

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, isolation of some reactor vessel interfaces occurs to begin isolating the potential sources of a break. The Reactor Vessel Water Level-Low (Level 3) Function associated with RHR Shutdown Cooling System isolation is not directly assumed in safety analyses because a break of the RHR Shutdown Cooling System is bounded by breaks of the recirculation and MSL. The RHR Shutdown Cooling System isolation on Level 3 supports actions to ensure that the RPV water level does not drop below the top of the active fuel during a vessel draindown event caused by a leak (e.g., pipe break or inadvertent valve opening) in the RHR Shutdown Cooling System.

Reactor Vessel Water Level-Low (Level 3) 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. Four channels (two channels per trip system) of the Reactor Vessel Water Level-Low (Level 3) Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. ~~As noted (footnote (a) to Table 3.3.6.1 1), only one channel per trip system (with an isolation signal available to one shutdown cooling pump suction isolation valve) of the Reactor Vessel Water Level-Low (Level 3) Function are required to be OPERABLE in MODES 4 and 5, provided the RHR Shutdown Cooling System integrity is maintained. System integrity is maintained provided the piping is intact and no maintenance is being performed that has the potential for draining the reactor vessel through the system.~~

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

6.b. Reactor Vessel Water Level-Low (Level 3) (continued)

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

The Reactor Vessel Water Level-Low (Level 3) Function is only required to be OPERABLE in MODES 3, 4, and 5 to prevent this potential flow path from lowering the reactor vessel level to the top of the fuel. In MODES 1 and 2, another isolation (i.e., Reactor Pressure-High) and administrative controls ensure that this flow path remains isolated to prevent unexpected loss of inventory via this flow path.

This Function isolates both RHR shutdown cooling pump suction valves.

Feedwater Recirculation Isolation

7.a. Reactor Pressure-High

The Reactor Pressure-High Function is provided to isolate the feedwater recirculation line. This interlock is provided only for equipment protection to prevent an intersystem LOCA scenario, and credit for the interlock is not assumed in the accident or transient analysis in the UFSAR.

The Reactor Pressure-High signals are initiated from four transmitters that are connected to different taps on the RPV. Four channels of Reactor Pressure-High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. The Function is only required to be OPERABLE in MODES 1, 2, and 3, since these are the only MODES in which the reactor can be pressurized; thus, equipment protection is needed. The Allowable Value was chosen to be low enough to protect the system equipment from overpressurization.

This Function isolates the feedwater recirculation valves.

Traversing Incore Probe System Isolation

8.a. Reactor Vessel Water Level-Low, Level 3

Low RPV water level indicates that the capability to cool the fuel may be threatened. The valves whose penetrations communicate with the primary containment are isolated to

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

1. Reactor Vessel Water Level—Low (Level 3) (continued)

The Reactor Vessel Water Level—Low (Level 3) Allowable Value was chosen to be the same as the RPS Level 3 scram Allowable Value (LCO 3.3.1.1), since isolation of these valves and SGT System start are not critical to orderly plant shutdown.

The Reactor Vessel Water Level—Low (Level 3) Function is required to be OPERABLE in MODES 1, 2, and 3 where considerable energy exists in the Reactor Coolant System (RCS); thus, there is a probability of pipe breaks resulting in significant releases of radioactive steam and gas. In MODES 4 and 5, the probability and consequences of these events are low due to the RCS pressure and temperature limitations of these MODES; thus, this Function is not required. ~~In addition, the Function is also required to be OPERABLE during operations with a potential for draining the reactor vessel (OPDRVs) because the capability of isolating potential sources of leakage must be provided to ensure that offsite dose limits are not exceeded if core damage occurs.~~

2. Drywell Pressure—High

High drywell pressure can indicate a break in the reactor coolant pressure boundary (RCPB). An isolation of the secondary containment and actuation of the SGT System are initiated in order to minimize the potential of an offsite dose release. The isolation on high drywell pressure supports actions to ensure that any offsite releases are within the limits calculated in the safety analysis. The Drywell Pressure—High Function associated with isolation is not assumed in any UFSAR accident or transient analyses but will provide an isolation and initiation signal. It is retained for the overall redundancy and diversity of the secondary containment isolation instrumentation as required by the NRC approved licensing basis.

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BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY

3. 4. Reactor Building Ventilation and Refueling Floor
Ventilation Exhaust Radiation-High (continued)

channels of Reactor Building Ventilation Exhaust Radiation-High Function and four channels of Refueling Floor Ventilation Exhaust Radiation-High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Allowable Values are chosen to promptly detect gross failure of the fuel cladding.

The Reactor Building Ventilation and Refueling Floor Ventilation Exhaust Radiation-High Functions are required to be OPERABLE in MODES 1, 2, and 3 where considerable energy exists; thus, there is a probability of pipe breaks resulting in significant releases of radioactive steam and gas. In MODES 4 and 5, the probability and consequences of these events are low due to the RCS pressure and temperature limitations of these MODES; thus, these Functions are not required. In addition, the Functions are also required to be OPERABLE ~~during OPRVs~~ and movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment, because the capability of detecting radiation releases due to fuel failures (due to fuel uncover or dropped fuel assemblies) must be provided to ensure that offsite dose limits are not exceeded.



ACTIONS

A Note has been provided to modify the ACTIONS related to secondary containment isolation 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 secondary containment isolation 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 secondary containment isolation instrumentation channel.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES,
LCO, and
APPLICABILITY
(continued)

The Control Room Air Intake Radiation—High Function consists of four independent monitors. Two channels of Control Room Air Intake Radiation—High per trip system are available and are required to be OPERABLE to ensure that no single instrument failure can preclude MCREV System initiation. The Allowable Value was selected to ensure protection of the control room personnel.

The Control Room Air Intake Radiation—High Function is required to be OPERABLE in MODES 1, 2, and 3 and during CORE ALTERATIONS, ~~OPDRVs~~, and movement of irradiated fuel assemblies in the secondary containment, to ensure that control room personnel are protected during a LOCA, fuel handling event, ~~or vessel draindown event~~. During MODES 4 and 5, when these specified conditions are not in progress (e.g., CORE ALTERATIONS), the probability of a LOCA or fuel damage is low; thus, the Function is not required.

or

ACTIONS

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

A.1 and A.2

Because of the redundancy of sensors available to provide initiation signals and the redundancy of the MCREV System design, an allowable out of service time of 6 hours has been shown to be acceptable (Ref. 4), to permit restoration of any inoperable channel to OPERABLE status. However, this out of service time is only acceptable provided the Control Room Air Intake Radiation—High Function is still maintaining MCREV System initiation capability. The Function is considered to be maintaining MCREV System

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

B 3.5.1 ECCS—Operating

BASES

BACKGROUND

The ECCS are designed, in conjunction with the primary and secondary containment, to limit the release of radioactive materials to the environment following a loss of coolant accident (LOCA). The ECCS uses two independent methods (flooding and spraying) to cool the core during a LOCA. The ECCS network consists of the High Pressure Coolant Injection (HPCI) System, the Core Spray (CS) System, the low pressure coolant injection (LPCI) mode of the Residual Heat Removal (RHR) System, and the Automatic Depressurization System (ADS). The suppression pool provides the required source of water for the ECCS. Although no credit is taken in the safety analyses for the condensate storage tank (CST), it is capable of providing a source of water for the HPCI and CS systems.

On receipt of an initiation signal, ECCS pumps automatically start; simultaneously, the system aligns and the pumps inject water, taken either from the CST or suppression pool, into the Reactor Coolant System (RCS) as RCS pressure is overcome by the discharge pressure of the ECCS pumps. Although the system is initiated, ADS action is delayed, allowing the operator to interrupt the timed sequence if the system is not needed. The HPCI pump discharge pressure almost immediately exceeds that of the RCS, and the pump injects coolant into the vessel to cool the core. If the break is small, the HPCI System will maintain coolant inventory as well as vessel level while the RCS is still pressurized. If HPCI fails, it is backed up by ADS in combination with LPCI and CS. In this event, the ADS timed sequence would be allowed to time out and open the selected safety/relief valves (S/RVs) depressurizing the RCS, thus allowing the LPCI and CS to overcome RCS pressure and inject coolant into the vessel. If the break is large, RCS pressure initially drops rapidly and the LPCI and CS cool the core.

Water from the break returns to the suppression pool where it is used again and again. Water in the suppression pool is circulated through an RHR System heat exchanger cooled by the High Pressure Service Water System. Depending on the location and size of the break, portions of the ECCS may be

(continued)

BASES

LCO
(continued)

pipng, resulting in the potential to damage the RHR System, including water hammer. This is necessary since the RHR System is required to operate in the shutdown cooling mode to remove decay heat and sensible heat from the reactor. 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 necessary. One LPCI subsystem shall be declared inoperable when MO-34A(B) and MO-39A(B) are simultaneously open in the same subsystem (one or both subsystems) with no Emergency Diesel Generators (EDGs) declared inoperable to ensure compliance to References 7, 14, and 15 single failure analyses (Ref. 11).

If the MO-34A and MO-39A are simultaneously open, the 'A' subsystem of LPCI shall be declared inoperable unless the E-1, E-2, or E-4 EDG is declared inoperable. If the MO-34B and MO-39B are simultaneously open, the 'B' subsystem of LPCI shall be declared inoperable unless the E-1, E-2, or E-3 EDG is 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, HPCI is not required to be OPERABLE because the low pressure ECCS subsystems can provide sufficient flow below this pressure. In MODES 2 and 3, when reactor steam dome pressure is ≤ 100 psig, ADS is 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,

R

~~"ECCS Shutdown."~~

"RPV WATER INVENTORY CONTROL."

4

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable HPCI subsystem. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable HPCI subsystem 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.

(continued)

, RPV WATER INVENTORY CONTROL (WIC),

~~ECCS Shutdown
B-3.5.2~~

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 the NRC Policy Statement.~~

LCO ~~Two low pressure ECCS injection/spray subsystems are required to be OPERABLE. A low pressure ECCS injection/spray subsystem consists of a CS subsystem or a LPCI subsystem. 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 one motor driven pump, piping, and valves to transfer water from the suppression pool to the RPV. Only a single LPCI pump is required per subsystem because of the larger injection capacity in relation to a CS subsystem. In MODES 4 and 5, the LPCI cross tie valve is not required to be closed. The necessary portions of the Emergency Service Water System are also required to provide appropriate cooling to each required ECCS subsystem, as necessary (Reference TRM 3.11). Management of gas voids is important to ECCS injection/spray subsystem OPERABILITY.~~

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BASES

LCO
(continued)

~~As noted, one LPCI subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned (remote or local) to the LPCI mode and is not otherwise inoperable. Alignment and operation for decay heat removal includes when the required RHR pump is not operating or when the system is realigned from or to the RHR shutdown cooling mode. This allowance is necessary since the RHR System may be required to operate in the shutdown cooling mode to remove decay heat and sensible heat from the reactor. Because of low pressure and low temperature conditions in MODES 4 and 5, sufficient time will be available to manually align and initiate LPCI subsystem operation to provide core cooling prior to postulated fuel uncoverly.~~

~~The following discussion applies when the LPCI cross tie valve (MO 20) is closed:~~

~~One LPCI subsystem shall not be considered one of the required ECCS injection/spray subsystems when MO 34A(B) and MO 39A(B) are simultaneously open in the same subsystem with no Emergency Diesel Generators (EDGs) declared inoperable. As discussed below, an exception to this may be taken if an EDG is declared inoperable.~~

~~If the MO 34A and MO 39A are simultaneously open, the 'A' subsystem of LPCI shall not be considered as one of the required ECCS injection/spray subsystems unless the E 1, E 2, or E 4 EDG is declared inoperable. If the MO 34B and MO 39B are simultaneously open, the 'B' subsystem of LPCI shall not be considered as one of the required ECCS injection/spray subsystems unless the E 1, E 2, or E 3 EDG is declared inoperable.~~

~~The following discussion applies when the LPCI cross tie valve (MO 20) is open:~~

~~The LPCI cross tie valve (MO 20) cannot be credited for closing during an event to isolate both LPCI subsystems. A pipe break within Primary Containment is assumed when the Reactor Coolant System (RCS) is pressurized. Conversely, a pipe break within Primary Containment is not assumed when the RCS is depressurized.~~

~~Mode 4 with RCS pressurized:~~

~~When the Unit is in Mode 4 with reactor steam dome pressure indicating that the RCS is pressurized, then both subsystems of LPCI are inoperable.~~

~~(continued)~~

BASES

LCO
(continued)

~~Mode 4 with RCS depressurized or Mode 5:~~

~~MO 34A(B) and MO 39A(B) Closed:~~

~~When the Unit is in Mode 4 with reactor steam dome pressure indicating that the RCS is depressurized or in Mode 5 AND there are no flow paths that could divert LPCI flow going to the reactor vessel (i.e., MO 34/39 closed), then both subsystems of LPCI can be considered operable as the required ECCS injection/spray subsystems.~~

~~MO 34A(B) and MO 39A(B) Open:~~

~~When MO 20, MO 34A, and MO 39A are simultaneously open, the 'A' subsystem of Core Spray and both subsystems of LPCI cannot be considered as separate ECCS injection/spray subsystems because a single failure (failure of the E 3 EDG) exists that causes the 'A' subsystem of Core Spray and both subsystems of LPCI to be unable to perform their design functions. As a result, the 'A' subsystem of Core Spray and both subsystems of LPCI can only be considered as one of the two required ECCS injection/spray subsystems when aligned in this configuration.~~

~~When MO 20, MO 34A, and MO 39A are simultaneously open with either the E 1, E 2, or E 4 EDG declared inoperable, then the 'A' and 'B' subsystems of LPCI may be credited as being operable, separate subsystems, since a failure of the E 3 EDG is not postulated.~~

~~When MO 20, MO 34B, and MO 39B are simultaneously open, the 'B' subsystem of Core Spray and both subsystems of LPCI cannot be considered as separate ECCS injection/spray subsystems because a single failure (failure of E 4 EDG) exists that causes the 'B' subsystem of Core Spray and both subsystems of LPCI to be unable to perform their design functions. As a result, the 'B' subsystem of Core Spray and both subsystems of LPCI can only be considered as one of the two required ECCS injection/spray subsystems when aligned in this configuration.~~

(continued)

BASES

LCO
(continued)

~~When MO 20, MO 34B, and MO 39B are simultaneously open with either the E 1, E 2, or E 3 EDG declared inoperable, then the 'A' and 'B' subsystems of LPCI may be credited as being operable, separate subsystems, since a failure of the E 4 EDG is not postulated.~~

APPLICABILITY

~~OPERABILITY of the low pressure ECCS injection/spray subsystems is required in MODES 4 and 5 to ensure adequate coolant inventory and sufficient heat removal capability for the irradiated fuel in the core in case of an inadvertent draindown of the vessel. Requirements for ECCS OPERABILITY during MODES 1, 2, and 3 are discussed in the Applicability section of the Bases for LCO 3.5.1. ECCS subsystems are not required to be OPERABLE during MODE 5 with the spent fuel storage pool gates removed, the water level maintained at ≥ 458 inches above reactor pressure vessel instrument zero (20 ft 11 inches above the RPV flange), and no operations with a potential for draining the reactor vessel (OPDRVs) in progress. This provides sufficient coolant inventory to allow operator action to terminate the inventory loss prior to fuel uncover in case of an inadvertent draindown.~~

~~The Automatic Depressurization System is not required to be OPERABLE during MODES 4 and 5 because the RPV pressure is ≤ 100 psig, and the CS System and the LPCI subsystems can provide core cooling without any depressurization of the primary system.~~

~~The High Pressure Coolant Injection System is not required to be OPERABLE during MODES 4 and 5 since the low pressure ECCS injection/spray subsystems can provide sufficient flow to the vessel.~~

ACTIONS

A.1 and B.1

~~If any one required low pressure ECCS injection/spray subsystem is inoperable, an inoperable subsystem must be restored to OPERABLE status in 4 hours. In this Condition, the remaining OPERABLE subsystem can provide sufficient vessel flooding capability to recover from an inadvertent vessel draindown. However, overall system reliability is reduced because a single failure in the remaining OPERABLE~~

(continued)

BASES

ACTIONS

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

~~subsystem concurrent with a vessel draindown could result in the ECCS not being able to perform its intended function. The 4 hour Completion Time for restoring the required low pressure ECCS injection/spray subsystem to OPERABLE status is based on engineering judgment that considered the remaining available subsystem and the low probability of a vessel draindown event.~~

~~With the inoperable subsystem not restored to OPERABLE status in the required Completion Time, action must be immediately initiated to suspend OPDRVs to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.~~

~~C.1, C.2, D.1, D.2, and D.3~~

~~With both of the required ECCS injection/spray subsystems inoperable, all coolant inventory makeup capability may be unavailable. Therefore, actions must immediately be initiated to suspend OPDRVs to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until OPDRVs are suspended. One ECCS injection/spray subsystem must also be restored to OPERABLE status within 4 hours.~~

~~If at least one low pressure ECCS injection/spray subsystem is not restored to OPERABLE status within the 4 hour Completion Time, additional actions are required to minimize any potential fission product release to the environment. This includes ensuring secondary containment is OPERABLE; one standby gas treatment subsystem for Unit 3 is OPERABLE; and secondary containment isolation capability (i.e., one isolation valve and associated instrumentation are OPERABLE or other acceptable administrative controls to assure isolation capability) in each associated secondary containment penetration flow path not isolated that is assumed to be isolated to mitigate radioactivity releases. OPERABILITY may be verified by an administrative check, or by examining logs or other information, to determine whether the components are out of service for maintenance or other reasons. It is not necessary to perform the Surveillances needed to demonstrate the OPERABILITY of the components.~~

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BASES

ACTIONS

~~C.1, C.2, D.1, D.2, and D.3 (continued)~~

~~If, however, any required component is inoperable, then it must be restored to OPERABLE status. In this case, the Surveillance may need to be performed to restore the component to OPERABLE status. Actions must continue until all required components are OPERABLE.~~

~~The 4 hour Completion Time to restore at least one low pressure ECCS injection/spray subsystem to OPERABLE status ensures that prompt action will be taken to provide the required cooling capacity or to initiate actions to place the plant in a condition that minimizes any potential fission product release to the environment.~~

SURVEILLANCE
REQUIREMENTS

~~SR 3.5.2.1 and SR 3.5.2.2~~

~~The minimum water level of 11.0 feet required for the suppression pool is periodically verified to ensure that the suppression pool will provide adequate net positive suction head (NPSH) for the CS System and LPCI subsystem pumps, recirculation volume, and vortex prevention. With the suppression pool water level less than the required limit, all ECCS injection/spray subsystems are inoperable unless they are aligned to an OPERABLE CST.~~

~~When suppression pool level is < 11.0 feet, the CS System is considered OPERABLE only if it can take suction from the CST, and the CST water level is sufficient to provide the required NPSH for the CS pump. Therefore, a verification that either the suppression pool water level is \geq 11.0 feet or that CS is aligned to take suction from the CST and the CST contains \geq 17.3 feet of water, equivalent to > 90,976 gallons of water, ensures that the CS System can supply at least 50,000 gallons of makeup water to the RPV. The unavailable volume of the CST for CS is at the 40,976 gallon level. However, as noted, only one required CS subsystem may take credit for the CST option during OPDRVs. During OPDRVs, the volume in the CST may not provide adequate makeup if the RPV were completely drained. Therefore, only one CS subsystem is allowed to use the CST. This ensures the other required ECCS subsystem has adequate makeup volume.~~

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BASES

~~SURVEILLANCE
REQUIREMENTS~~

~~SR 3.5.2.1 and SR 3.5.2.2 (continued)~~

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

~~SR 3.5.2.3, SR 3.5.2.5, and SR 3.5.2.6~~

~~The Bases provided for SR 3.5.1.1, SR 3.5.1.7, and SR 3.5.1.10 are applicable to SR 3.5.2.3, SR 3.5.2.5, and SR 3.5.2.6, respectively.~~

~~SR 3.5.2.4~~

~~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 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 RHR System, verify each RHR heat exchanger inlet flow control valve is positioned to achieve at least the minimum flow rate required by SR 3.5.2.5. 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 an individual who can rapidly close the system vent flow path if directed.~~

~~(continued)~~

BASES

REFERENCES

- ~~1. NEDO 20566A, "General Electric Company Analytical Model for Loss of Coolant Accident Analysis in Accordance with 10 CFR 50 Appendix K," September 1986.~~
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B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

B 3.5.3 RCIC System

BASES

BACKGROUND

The RCIC System is not part of the ECCS; however, the RCIC System is included with the ECCS section because of their similar functions.

The RCIC System is designed to operate either automatically or manually following reactor pressure vessel (RPV) isolation accompanied by a loss of coolant flow from the feedwater system to provide adequate core cooling and control of the RPV water level. Under these conditions, the High Pressure Coolant Injection (HPCI) and RCIC systems perform similar functions. The RCIC System design requirements ensure that the criteria of Reference 1 are satisfied.

The RCIC System (Ref. 2) consists of a steam driven turbine pump unit, piping, and valves to provide steam to the turbine, as well as piping and valves to transfer water from the suction source to the core via the feedwater system line, where the coolant is distributed within the RPV through the feedwater sparger. Suction piping is provided from the condensate storage tank (CST) and the suppression pool. Pump suction is normally aligned to the CST to minimize injection of suppression pool water into the RPV. However, if the CST water supply is low, an automatic transfer to the suppression pool water source ensures a water supply for continuous operation of the RCIC System. The steam supply to the turbine is piped from a main steam line upstream of the associated inboard main steam line isolation valve.

The RCIC System is designed to provide core cooling for a wide range of reactor pressures (150 psig to 1170 psig). Upon receipt of an initiation signal, the RCIC turbine accelerates to a specified speed. As the RCIC flow increases, the turbine governor valve is automatically adjusted to maintain design flow. Exhaust steam from the RCIC turbine is discharged to the suppression pool. A full flow test line is provided to route water back to the CST to allow testing of the RCIC System during normal operation without injecting water into the RPV.

(continued)

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 when the 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 Safeguard 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 satisfies Criterion 4 of the NRC Policy Statement.

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.

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RPV inventory control is required by LCO 3.5.4, "RPV Water Level Inventory Control."

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

B 3.5.4 Reactor Pressure Vessel (RPV) Water Inventory Control

BASES

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

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

A double-ended guillotine break of the Reactor Coolant System (RCS) is not postulated in MODES 4 and 5 due to the reduced RCS pressure, reduced piping stresses, and ductile piping systems. Instead, an event is considered in which single operator error or initiating event allows draining of the RPV water inventory through a single penetration flow path with the highest flow rate, or the sum of the drain rates through multiple penetration flow paths susceptible to a common mode failure (e.g., seismic event (except when risk is assessed and managed in accordance with TS 3.0.8), loss of normal power, single human error). It is assumed, based on engineering judgment, that while in MODES 4 and 5, one low pressure ECCS injection/spray subsystem can maintain adequate reactor vessel water level.

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

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

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BASES

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

One low pressure ECCS injection/spray subsystem is required to be OPERABLE and capable of being manually started to provide defense-in-depth should an unexpected draining event occur. A low pressure ECCS injection/spray subsystem consists of either one Core Spray (CS) subsystem or one Low Pressure Coolant Injection (LPCI) subsystem.

Each CS subsystem consists of one motor driven pump, piping, and valves to transfer water from the suppression pool or condensate storage tank (CST) to the RPV.

Each LPCI subsystem consists of one motor driven pump, piping, and valves to transfer water from the suppression pool to the RPV. In MODES 4 and 5, the RHR System cross tie valve is not required to be closed.

The LCO is modified by a Note which allows a required LPCI subsystem to be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned (remote or local) to the LPCI mode and is not otherwise inoperable.

Alignment and operation for decay heat removal includes when the required RHR pump is not operating or when the system is realigned from or to the RHR shutdown cooling mode. This allowance is necessary since the RHR System may be required to operate in the shutdown cooling mode to remove decay heat and sensible heat from the reactor. Because of the restrictions on DRAIN TIME, sufficient time will be available following an unexpected draining event to manually align and initiate LPCI subsystem operation to maintain RPV water inventory prior reaching the TAF.

APPLICABILITY

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

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BASES

ACTIONS

A.1 and B.1

If the required low pressure ECCS injection/spray subsystem is inoperable, it must be restored to OPERABLE status within 4 hours. In this Condition, the LCO controls on DRAIN TIME minimize the possibility that an unexpected draining event could necessitate the use of the ECCS injection/spray subsystem, however the defense-in-depth provided by the ECCS injection/spray subsystem is lost.

The 4 hour Completion Time for restoring the required low pressure ECCS injection/spray subsystem to OPERABLE status is based on engineering judgment that considers the LCO controls on DRAIN TIME and the low probability of an unexpected draining event that would result in loss of RPV water inventory.

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

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

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

The secondary containment provides a controlled volume in which fission products can be contained, diluted, and processed prior to release to the environment. Required Action C.1 requires verification of the capability to establish the secondary containment boundary in less than the DRAIN TIME.

(continued)

BASES

ACTIONS
(continued)

The required verification confirms actions to establish the secondary containment boundary are preplanned and necessary materials are available. The secondary containment boundary is considered established when one Standby Gas Treatment (SGT) subsystem is capable of maintaining a negative pressure in the secondary containment with respect to the environment. Verification that the secondary containment boundary can be established must be performed within 4 hours. The required verification is an administrative activity and does not require manipulation or testing of equipment.

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

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

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

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

Required Action D.1 requires immediate action to establish an additional method of water injection augmenting the ECCS injection/spray subsystem required by the LCO. The additional method of water injection includes the necessary instrumentation and controls, water sources, and pumps and

(continued)

BASES

ACTIONS
(continued)

valves needed to add water to the RPV or refueling cavity should an unexpected draining event occur. The Note to Required Action D.1 states that either the ECCS injection/spray subsystem or the additional method of water injection must be capable of operating without offsite electrical power. The additional method of water injection may be manually initiated and may consist of one or more systems or subsystems. The additional method of water injection must be able to access water inventory capable of being injected to maintain the RPV water level above the TAF for ≥ 36 hours. The additional method of water injection and the ECCS injection/spray subsystem may share all or part of the same water sources. If recirculation of injected water would occur, it may be credited in determining the required water volume.

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

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

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

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

E.1

If the Required Actions and associated Completion times of Conditions C or D are not met or if the DRAIN TIME is less

(continued)

BASES

ACTIONS
(continued)

than 1 hour, actions must be initiated immediately to restore the DRAIN TIME to ≥ 36 hours. In this condition, there may be insufficient time to respond to an unexpected draining event to prevent the RPV water inventory from reaching the TAF. Note that Required Actions D.1, D.2, D.3, and D.4 are also applicable when DRAIN TIME is less than 1 hour.

SURVEILLANCE
REQUIREMENTS

SR 3.5.4.1

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

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

The definition of DRAIN TIME excludes from the calculation those penetration flow paths connected to an intact closed system, or isolated by manual or automatic valves that are locked, sealed, or otherwise secured in the closed position, blank flanges, or other devices that prevent flow of reactor coolant through the penetration flow paths. A blank flange or other bolted device must be connected with a sufficient number of bolts to prevent draining in the event of an Operating Basis Earthquake. Normal or expected leakage from closed systems or past isolation devices is permitted. Determination that a system is intact and closed or isolated must consider the status of branch lines and ongoing plant maintenance and testing activities.

The Residual Heat Removal (RHR) Shutdown Cooling System is only considered an intact closed system when misalignment issues (Reference 6) have been precluded by functional valve

(continued)

BASES

SURVEILLANCE
REQUIREMENTS
(continued)

interlocks or by isolation devices, such that redirection of RPV water out of an RHR subsystem is precluded. Further, RHR Shutdown Cooling System is only considered an intact closed system if its controls have not been transferred to Remote Shutdown, which disables the interlocks and isolation signals.

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

Surveillance Requirement 3.0.1 requires SRs to be met between performances. Therefore, any changes in plant conditions that would change the DRAIN TIME requires that a new DRAIN TIME be determined.

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

SR 3.5.4.2 and SR 3.5.4.3

The minimum water level of 11.0 ft. required for the suppression pool is periodically verified to ensure that the suppression pool will provide adequate net positive suction head (NPSH) for the CS subsystem or LPCI subsystem pump, recirculation volume, and vortex prevention. With the suppression pool water level less than the required limit required ECCS injection/spray subsystem is inoperable unless aligned to an OPERABLE CST.

The required CS System is OPERABLE only if it can take suction from the CST, and the CST water level is sufficient to provide the required NPSH for the CS pump. Therefore, a verification that either the suppression pool water level is ≥ 11.0 ft. or that a required CS subsystem is aligned to take suction from the CST and the CST contains $\geq 90,976$ gallons of water, equivalent to 17.3 ft., ensures that the CS subsystem can supply at least 50,000 gallons of makeup water to the RPV. The CS suction is uncovered at the 40,976 gallon level.

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

(continued)

BASES

SURVEILLANCE
REQUIREMENTS
(continued)

SR 3.5.4.4

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

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

SR 3.5.4.5

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

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

SR 3.5.4.6

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

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

SR 3.5.4.7

Verifying that each valve credited for automatically isolating

(continued)

BASES

SURVEILLANCE
REQUIREMENTS
(continued)

a penetration flow path actuates to the isolation position on an actual or simulated RPV water level isolation signal is required to prevent RPV water inventory from dropping below the TAF should an unexpected draining event occur.

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

SR 3.5.4.8

The required ECCS subsystem is required to be manually actuated. This Surveillance verifies that the required CS subsystems or LPCI subsystem (including the associated pump / valve(s)) can be placed into service.

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

REFERENCES

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

LCO
(continued)

de-activated and secured in their closed position, blind flanges are in place, and closed systems are intact. These passive isolation valves and devices are those listed in Reference 2 and Reference 5.

MSIVs must meet additional leakage rate requirements. Other PCIV leakage rates are addressed by LCO 3.6.1.1, "Primary Containment," as Type B or C testing.

This LCO provides assurance that the PCIVs will perform their designed safety functions to minimize the loss of reactor coolant inventory and establish the primary containment boundary during accidents.

APPLICABILITY

In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, ~~most~~ PCIVs are not required to be OPERABLE and the primary containment purge and exhaust valves are not required to be normally closed in MODES 4 and 5. Certain valves, however, are required to be OPERABLE to prevent inadvertent reactor vessel draindown. ~~These valves are those whose~~ associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation." (This does not include the valves that isolate the associated instrumentation.)

when the

ACTIONS

The ACTIONS are modified by a Note allowing penetration flow path(s) except for purge or exhaust valve flow path(s) to be unisolated intermittently under administrative controls. These controls consist of stationing a dedicated operator at the controls of the valve, who is in continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for primary containment isolation is indicated. Due to the size of the primary containment purge line penetration and the fact that those penetrations exhaust directly from the containment atmosphere to the environment, the penetration flow path containing these valves is not allowed to be operated under administrative controls.

(continued)

BASES

ACTIONS
(continued)

G.1 and G.2

If any Required Action and associated Completion Time cannot be met for PCIV(s) required to be OPERABLE during MODE 4 or 5, the unit must be placed in a condition in which the LCO does not apply. Action must be immediately initiated ~~to suspend operations with a potential for draining the reactor vessel (OPDRVs) to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended and valve(s) are restored to OPERABLE status. If suspending an OPDRV would result in closing the residual heat removal (RHR) shutdown cooling isolation valves, an alternative Required Action is provided to immediately initiate action~~ to restore the valve(s) to OPERABLE status. This allows RHR to remain in service while actions are being taken to restore the valve.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES Initial suppression pool water level affects suppression pool temperature response calculations, calculated drywell pressure during vent clearing for a DBA, calculated pool swell loads for a DBA LOCA, and calculated loads due to S/RV discharges. Suppression pool water level must be maintained within the limits specified so that the safety analysis of Reference 1 remains valid.

Suppression pool water level satisfies Criteria 2 and 3 of the NRC Policy Statement.

LCO A limit that suppression pool water level be ≥ 14.5 feet and ≤ 14.9 feet is required to ensure that the primary containment conditions assumed for the safety analyses are met. Either the high or low water level limits were used in the safety analyses, depending upon which is more conservative for a particular calculation.

APPLICABILITY In MODES 1, 2, and 3, a DBA would cause significant loads on the 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. The requirement for maintaining suppression pool water level within limits in MODE 4 or 5 is addressed in LCO 3.5.2 "~~ECCS Shutdown~~". "RPV Water Inventory Control".

ACTIONS A.1

With suppression pool water level outside the limits, the conditions assumed for the safety analyses are not met. If water level is below the minimum level, the pressure suppression function still exists as long as main vents are covered, HPCI and RCIC turbine exhausts are covered, and S/RV quenchers are covered. If suppression pool water level is above the maximum level, protection against overpressurization still exists due to the margin in the peak containment pressure analysis and the capability of the Drywell Spray System. Therefore, continued operation for a limited time is allowed. The 2 hour Completion Time is sufficient to restore suppression pool water level to within limits. Also, it takes into account the low probability of an event impacting the suppression pool water level occurring during this interval.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued) however, its leak tightness is required to ensure that fission products entrapped within the secondary containment structure will be treated by the SGT System prior to discharge to the environment.

Secondary containment satisfies Criterion 3 of the NRC Policy Statement.

LCO An OPERABLE secondary containment provides a control volume into which fission products that leak from primary containment, or are released from the reactor coolant pressure boundary components located in secondary containment, can be processed prior to release to the environment. For the secondary containment to be considered OPERABLE, it must have adequate leak tightness to ensure that the required vacuum can be established and maintained.

APPLICABILITY In MODES 1, 2, and 3, a LOCA could lead to a fission product release to primary containment that leaks to secondary containment. Therefore, secondary containment OPERABILITY is required during the same operating conditions that require primary containment OPERABILITY.

In MODES 4 and 5, the probability and consequences of the LOCA are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining secondary containment OPERABLE is not required in MODE 4 or 5, except for other situations for which significant releases of radioactive material can be postulated, such as ~~during operations with a potential for draining the reactor vessel (OPDRVs), or~~ during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment. However, outside ground level hatches (hatches H20 through H24 and Torus room access hatch H34) may not be opened during movement of irradiated fuel. This will maintain CR dose acceptable.



ACTIONS

A.1

If secondary containment is inoperable, it must be restored to OPERABLE status within 4 hours. The 4 hour Completion Time provides a period of time to correct the problem that is commensurate with the importance of maintaining secondary containment during MODES 1, 2, and 3. This time period also ensures that the probability of an accident (requiring secondary containment OPERABILITY) occurring during periods where secondary containment is inoperable is minimal.

(continued)

BASES

ACTIONS
(continued)

B.1

If secondary containment cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant 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. 3) 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. 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.

C.1 and C.2

Movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment ~~and OPDRVs~~ can be postulated to cause fission product release to the secondary containment. In such cases, the secondary containment is the only barrier to release of fission products to the environment. Therefore, movement of RECENTLY IRRADIATED FUEL assemblies must be immediately suspended if the secondary containment is inoperable.

Suspension of these activities shall not preclude completing an action that involves moving a component to a safe position. ~~Also, action must be immediately initiated to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.~~

Required Action C.1 has been modified by a Note stating that LCO 3.0.3 is not applicable, since the movement of RECENTLY IRRADIATED FUEL can only be performed in MODES 4 and 5.

(continued)

BASES

APPLICABLE
SAFETY ANALYSES
(continued)

boundary established by SCIVs is required to ensure that leakage from the primary containment is processed by the Standby Gas Treatment (SGT) System before being released to the environment.

Maintaining SCIVs OPERABLE with isolation times within limits ensures that fission products will remain trapped inside secondary containment so that they can be treated by the SGT System prior to discharge to the environment.

SCIVs satisfy Criterion 3 of the NRC Policy Statement.

LCO

SCIVs form a part of the secondary containment boundary. The SCIV safety function is related to control of offsite radiation releases resulting from DBAs.

The power operated automatic isolation valves are considered OPERABLE when their isolation times are within limits and the valves actuate on an automatic isolation signal. The valves covered by this LCO, along with their associated stroke times, are listed in Reference 2. ✕

The normally closed isolation valves or blind flanges are considered OPERABLE when manual valves are closed or open in accordance with appropriate administrative controls, automatic SCIVs are de-activated and secured in their closed position, and blind flanges are in place. These passive isolation valves or devices are listed in Reference 2. ✕

APPLICABILITY

In MODES 1, 2, and 3, a DBA could lead to a fission product release to the primary containment that leaks to the secondary containment. Therefore, the OPERABILITY of SCIVs is required.

In MODES 4 and 5, the probability and consequences of these events are reduced due to pressure and temperature limitations in these MODES. Therefore, maintaining SCIVs OPERABLE is not required in MODE 4 or 5, except for other situations under which significant radioactive releases can be postulated, such as ~~during operations with a potential for draining the reactor vessel (OPDRVs) or~~ during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment. SCIVs are only required to be OPERABLE during handling RECENTLY IRRADIATED FUEL. Moving irradiated fuel assemblies in the secondary containment may also occur in MODES 1, 2, and 3. ✕

(continued)

BASES

ACTIONS
(continued)

C.1 and C.2

If any Required Action and associated Completion Time cannot be met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

D.1 and D.2

If any Required Action and associated Completion Time are not met, the plant must be placed in a condition in which the LCO does not apply. If applicable, the movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment must be immediately suspended. Suspension of this activity shall not preclude completion of movement of a component to a safe position. ~~Also, if applicable, actions must be immediately initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.~~

Required Action D.1 has been modified by a Note stating that LCO 3.0.3 is not applicable, since the movement of RECENTLY IRRADIATED FUEL can only be performed in MODES 4 and 5.

SURVEILLANCE
REQUIREMENTS

SR 3.6.4.2.1

This SR verifies that each secondary containment manual isolation valve and blind flange that is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside of the secondary containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification that those SCIVs in secondary containment that are capable of being mispositioned are in the correct position.


(continued)

BASES

LCO
(continued) For Unit 3, one SGT subsystem is OPERABLE when one charcoal filter train, one fan (OCV020) and associated ductwork, dampers, valves, and controls are OPERABLE. The second SGT subsystem is OPERABLE when the other charcoal filter train, one fan (OBV020) and associated ductwork, damper, valves, and controls are OPERABLE.

APPLICABILITY In MODES 1, 2, and 3, a DBA could lead to a fission product release to primary containment that leaks to secondary containment. Therefore, SGT System OPERABILITY is required during these MODES.

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 the SGT System in OPERABLE status is not required in MODE 4 or 5, except for other situations under which significant releases of radioactive material can be postulated, such as ~~during operations with a potential for draining the reactor vessel (OPDRVs) or during movement of RECENTLY IRRADIATED FUEL assemblies in the secondary containment.~~ The SGT System is only required to be OPERABLE during OPRDVs or handling of RECENTLY IRRADIATED FUEL.



ACTIONS

A.1

With one SGT subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status in 7 days. In this Condition, the remaining OPERABLE SGT subsystem is adequate to perform the required radioactivity release control function. However, the overall system reliability is reduced because a single failure in the OPERABLE subsystem could result in the radioactivity release control function not being adequately performed. The 7 day Completion Time is based on consideration of such factors as the availability of the OPERABLE redundant SGT subsystem and the low probability of a DBA occurring during this period.

B.1

If the SGT subsystem cannot be restored to OPERABLE status within the required Completion Time in MODE 1, 2, or 3, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. Remaining in the

(continued)

BASES

ACTIONS

B.1 (continued)

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. 3) 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. 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.

~~C.1, C.2.1 and C.2.2~~

During movement of RECENTLY IRRADIATED FUEL assemblies, in the secondary containment ~~or during OPDRVs~~, when Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE SGT subsystem should immediately be placed in operation. This action ensures that the remaining subsystem is OPERABLE, that no failures that could prevent automatic actuation have occurred, and that any other failure would be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that represent a potential for releasing radioactive material to the secondary containment, thus placing the plant in a condition that minimizes risk. If applicable, movement of RECENTLY IRRADIATED FUEL assemblies must immediately be suspended. Suspension of this activity must not preclude completion of movement of a component to a safe position. ~~Also, if applicable, actions must immediately be initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.~~

The Required Actions of Condition C have been modified by a Note stating that LCO 3.0.3 is not applicable, since the movement of RECENTLY IRRADIATED FUEL can only be performed in MODES 4 and 5.

(continued)

BASES

ACTIONS
(continued)

D.1

If both SGT subsystems are inoperable in MODE 1, 2, or 3, the SGT System may not be capable of supporting the required radioactivity release control function. Therefore, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant 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. 3) 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. 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.

E.1 and E.2

When two SGT subsystems are inoperable, if applicable, movement of RECENTLY IRRADIATED FUEL assemblies in secondary containment must immediately be suspended. Suspension of this activity shall not preclude completion of movement of a component to a safe position. ~~Also, if applicable, actions must immediately be initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.~~

Required Action E.1 has been modified by a Note stating that LCO 3.0.3 is not applicable, since the movement of RECENTLY IRRADIATED FUEL can only be performed in MODES 4 and 5.

SURVEILLANCE
REQUIREMENTS

SR 3.6.4.3.1

Operating each SGT subsystem (including each filter train fan) for ≥ 15 minutes ensures that both subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. Operation with the heaters on (automatic heater cycling to maintain temperature) for ≥ 15 minutes periodically is sufficient to eliminate moisture on the adsorbers and HEPA filters since during idle periods instrument air is injected into the filter plenum to keep the filters dry. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

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BASES (continued)

APPLICABILITY In MODES 1, 2, and 3, the MCREV System must be OPERABLE to ensure that the CRE will remain habitable during and following a DBA, since the DBA could lead to a fission product release.

In MODES 4 and 5, the probability and consequences of a DBA are reduced because of the pressure and temperature limitations in these MODES. Therefore, maintaining the MCREV System OPERABLE is not required in MODE 4 or 5, except for the following situations under which significant radioactive releases can be postulated:

- a. ~~During operations with potential for draining the reactor vessel (OPDRVs);~~
- b. ~~During CORE ALTERATIONS; and~~
- c. ~~During movement of irradiated fuel assemblies in the secondary containment.~~

ACTIONS

A.1

With one MCREV subsystem inoperable, for reasons other than an inoperable CRE boundary, the inoperable MCREV subsystem must be restored to OPERABLE status within 7 days. With the unit in this condition, the remaining OPERABLE MCREV subsystem is adequate to maintain control room temperature and to perform the CRE occupant protection function. However, the overall reliability is reduced because a failure in the OPERABLE subsystem could result in loss of the MCREV System function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and that the remaining subsystem can provide the required capabilities.

B.1, B.2 and B.3

If the unfiltered inleakage of potentially contaminated air past a CRE boundary and into the CRE can result in CRE occupant radiological dose greater than the calculated dose of the licensing basis analyses of DBA consequences (allowed to be up to 5 rem total effective dose equivalent (TEDE)), or inadequate protection of CRE occupants from hazardous chemicals or smoke that have been licensed to occur, the CRE boundary is inoperable. Actions must be taken to restore an OPERABLE CRE boundary within 90 days.

(continued)

BASES

and

ACTIONS
(continued)

~~D.1, D.2.1, D.2.2, and D.2.3~~

The Required Actions of Condition D are modified by a Note indicating that LCO 3.0.3 does not apply. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, ~~or during OPDRVs~~, if the inoperable MCREV subsystem cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE MCREV subsystem may be placed in operation. This action ensures that the remaining subsystem is OPERABLE, that no failures that would prevent automatic actuation will occur, and that any active failure will be readily detected.

An alternative to Required Action D.1 is to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk.

If applicable, CORE ALTERATIONS and movement of irradiated fuel assemblies in the secondary containment must be suspended immediately. Suspension of these activities shall not preclude completion of movement of a component to a safe position. ~~Also, if applicable, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.~~

E.1

If both MCREV subsystems are inoperable in MODE 1, 2, or 3 for reasons other than an inoperable CRE boundary (i.e., Condition B), the MCREV System may not be capable of performing the intended function. Therefore, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant 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. 5) 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. 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.

(continued)

BASES

and

ACTIONS
(continued)

~~F.1, F.2 and F.3~~

The Required Actions of Condition F are modified by a Note indicating that LCO 3.0.3 does not apply. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, ~~or during OPDRVs~~, with two MCREV subsystems inoperable or with one or more MCREV subsystems inoperable due to an inoperable CRE boundary, action must be taken immediately to suspend activities that present a potential for releasing radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk.

If applicable, CORE ALTERATIONS and movement of irradiated fuel assemblies in the secondary containment must be suspended immediately. Suspension of these activities shall not preclude completion of movement of a component to a safe position. ~~If applicable, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.~~

SURVEILLANCE
REQUIREMENTS

SR 3.7.4.1

This SR verifies that a subsystem in a standby mode starts on demand and continues to operate for ≥ 15 minutes. Standby systems should be checked periodically to ensure that they start and function properly. As the environmental and normal operating conditions of this system are not severe, testing each subsystem periodically provides an adequate check on this system. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.4.2

This SR verifies that the required MCREV testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

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B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 AC Sources—Shutdown

BASES

BACKGROUND A description of the AC sources is provided in the Bases for LCO 3.8.1, "AC Sources—Operating."

APPLICABLE SAFETY ANALYSES The OPERABILITY of the minimum AC sources during MODES 4 and 5 and during movement of irradiated fuel assemblies in secondary containment ensures that:

- a. The facility can be maintained in the shutdown or refueling condition for extended periods;
- b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and
- c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as ~~an inadvertent draindown of the vessel or a fuel handling accident.~~

In general, when the unit is shut down the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or loss of all onsite power is not required. The rationale for this is based on the fact that many Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, and 3 have no specific analyses in MODES 4 and 5. Worst case bounding events are deemed not credible in MODES 4 and 5 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and corresponding stresses result in the probabilities of occurrences significantly reduced or eliminated, and minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

During MODES 1, 2, and 3, various deviations from the analysis assumptions and design requirements are allowed within the ACTIONS. This allowance is in recognition that

(continued)

BASES

LCO
(continued)

offsite circuit. In addition some equipment that may be required by Unit 3 is powered from Unit 2 sources (e.g., Containment Atmospheric Dilution System, Standby Gas Treatment System, Emergency Service Water System, and Main Control Room Emergency Ventilation System). Therefore, qualified circuits between the offsite transmission network and the Unit 2 onsite Class 1E AC electrical power distribution subsystem(s), and the DG(s) (not necessarily different DG(s) from those being used to meet LCO 3.8.2.b requirements) capable of supplying power to the required Unit 2 subsystems of each of the required components must also be OPERABLE. Together, OPERABILITY of the required offsite circuit(s) and required DG(s) ensures the availability of sufficient AC sources to operate the plant in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents ~~and reactor vessel draindown~~). Automatic initiation of the required DG during shutdown conditions is specified in ~~LCO 3.3.5.1, ECCS Instrumentation, and LCO 3.3.8.1, LOP Instrumentation.~~

The qualified Unit 3 offsite circuit must be capable of maintaining rated frequency and voltage while connected to the respective Unit 3 4 kV emergency bus(es), and of accepting required loads during an accident. Qualified offsite circuits are those that are described in the UFSAR, Technical Specification Bases Section 3.8.1 and are part of the licensing basis for the unit. A Unit 3 offsite circuit consists of the incoming breaker and disconnect to the startup and emergency auxiliary transformer, the respective circuit path to the emergency auxiliary transformer and the circuit path to the Unit 3 4 kV emergency buses required by LCO 3.8.8, including feeder breakers to the required Unit 3 4 kV emergency buses. A qualified Unit 2 offsite circuit's requirements are the same as the Unit 3 circuit's requirements, except that the circuit path, including the feeder breakers, is to the Unit 2 4 kV emergency buses required to be OPERABLE by LCO 3.8.8.

The required DGs must be capable of starting, accelerating to rated speed and voltage, and connecting to their respective Unit 3 emergency bus on detection of bus undervoltage. This sequence must be accomplished within 10 seconds. Each DG must also be capable of accepting required loads within the assumed loading sequence intervals, and must continue to operate until offsite power can be restored to the 4 kV emergency buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with engine hot and DG in standby with engine at ambient conditions. Additional

(continued)

BASES

LCO
(continued)

DG capabilities must be demonstrated to meet required Surveillances, e.g., capability of the DG to revert to standby status on an ECCS signal while operating in parallel test mode. Proper sequencing of loads is a required function for DG OPERABILITY. The necessary portions of the Emergency Service Water System are also required to provide appropriate cooling to each required DG.

The OPERABILITY requirements for the DG capable of supplying power to the Unit 2 powered equipment are the same as described above, except that the required DG must be capable of connecting to its respective Unit 2 4 kV emergency bus. (In addition, the Unit 2 ECCS initiation logic SRs are not applicable, as described in SR 3.8.2.2 Bases.)

It is acceptable for 4 kV emergency buses to be cross tied during shutdown conditions, permitting a single offsite power circuit to supply all required buses. No automatic transfer capability is required for offsite circuits to be considered OPERABLE.

APPLICABILITY

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

that provide core cooling

- a. ~~Systems providing adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core in case of an inadvertent draindown of the reactor vessel;~~
- b. Systems needed to mitigate a fuel handling accident are available;
- c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and
- d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

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

(continued)

BASES (continued)

ACTIONS

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

A.1 and B.1

and

With one or more required offsite circuits inoperable, or with one DG inoperable, the remaining required sources may be capable of supporting sufficient required features (e.g., system, subsystem, division, component, or device) to allow continuation of CORE ALTERATIONS, ~~fuel movement, and operations with a potential for draining the reactor vessel.~~ For example, if two or more 4 kV emergency buses are required per LCO 3.8.8, one 4 kV emergency bus with offsite power available may be capable of supplying sufficient required features. By the allowance of the option to declare required features inoperable that are not powered from offsite power (Required Action A.1) or capable of being powered by the required DG (Required Action B.1), appropriate restrictions can be implemented in accordance with the affected feature(s) LCOs' ACTIONS. Required features remaining powered from a qualified offsite power circuit, even if that circuit is considered inoperable because it is not powering other required features, are not declared inoperable by this Required Action. If a single DG is credited with meeting both LCO 3.8.2.d and one of the DG requirements of LCO 3.8.2.b, then the required features remaining capable of being powered by the DG are not declared inoperable by this Required Action, even if the DG is considered inoperable because it is not capable of powering other required features.

A.2.1, A.2.2, A.2.3, ~~A.2.4~~, B.2.1, B.2.2, B.2.3, ~~B.2.4~~, C.1, C.2, C.3, and C.4

and

With an offsite circuit not available to all required 4 kV emergency buses or one required DG inoperable, the option still exists to declare all required features inoperable

(continued)

BASES

ACTIONS

~~A.2.1, A.2.2, A.2.3, A.2.4, B.2.1, B.2.2, B.2.3, B.2.4, C.1, C.2, C.3, and C.4~~ (continued)

and

(per Required Actions A.1 and B.1). Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With two or more required DGs inoperable, the minimum required diversity of AC power sources may not be available. It is, therefore, required to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies in the secondary containment, and activities that could result in inadvertent draining of the reactor vessel.

and

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC sources and to continue this action until restoration is accomplished in order to provide the necessary AC power to the plant safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the plant safety systems may be without sufficient power.

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A have been modified by a Note to indicate that when Condition A is entered with no AC power to any required 4 kV emergency bus, ACTIONS for LCO 3.8.8 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite circuit whether or not a required bus is de-energized. LCO 3.8.8 provides the appropriate restrictions for the situation involving a de-energized bus.

SURVEILLANCE
REQUIREMENTS

SR 3.8.2.1

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the Unit 3 AC sources in other than MODES 1, 2, and 3. SR 3.8.1.8 is not

(continued)

BASES

SURVEILLANCE
REQUIREMENTS

SR 3.8.2.1 (continued)

required to be met since only one offsite circuit is required to be OPERABLE. SR 3.8.1.17 is not required to be met because the required OPERABLE DG(s) is not required to undergo periods of being synchronized to the offsite circuit. SR 3.8.1.20 is excepted because starting independence is not required with the DG(s) that is not required to be OPERABLE. Refer to the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DG(s) from being paralleled with the offsite power network or otherwise rendered inoperable during the performance of SRs, and to preclude de-energizing a required 4 kV emergency bus or disconnecting a required offsite circuit during performance of SRs. With limited AC sources available, a single event could compromise both the required circuit and the DG. It is the intent that these SRs must still be capable of being met, but actual performance is not required during periods when the DG and offsite circuit are required to be OPERABLE.

This SR is modified by a second Note. The reason for the Note is to preclude requiring the automatic functions of the DG(s) on an ECCS initiation to be functional during periods when ECCS are not required. ~~Periods in which ECCS are not required are specified in LCO 3.5.2, "ECCS Shutdown".~~

SR 3.8.2.2

This Surveillance is provided to direct that the appropriate Surveillances for the required Unit 2 AC sources are governed by the Unit 2 Technical Specifications. Performance of the applicable Unit 2 Surveillances will satisfy Unit 2 requirements, as well as satisfying this Unit 3 Surveillance Requirement. Seven exceptions are noted to the Unit 2 SRs of LCO 3.8.1. SR 3.8.1.8 is excepted when only one Unit 2 offsite circuit is required by the Unit 3 Specification, since there is not a second circuit to transfer to. SR 3.8.1.12, SR 3.8.1.13, SR 3.8.1.17, SR 3.8.1.18 (ECCS load block requirements only), and SR 3.8.1.19 are excepted since these SRs test the Unit 2 ECCS initiation signal, which is not needed for the AC sources to be OPERABLE on Unit 3. SR 3.8.1.20 is excepted since starting independence is not required with the DG(s) that is not required to be OPERABLE.

(continued)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.5 DC Sources—Shutdown

BASES

BACKGROUND A description of the DC sources is provided in the Bases for LCO 3.8.4, "DC Sources—Operating."

APPLICABLE SAFETY ANALYSES The initial conditions of Design Basis Accident and transient analyses in the UFSAR, Chapter 14 (Ref. 1), assume that Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the diesel generators (DGs), emergency auxiliaries, and control and switching during all MODES of operation.

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum DC electrical power sources during MODES 4 and 5 and during movement of irradiated fuel assemblies in secondary containment ensures that:

- a. The facility can be maintained in the shutdown or refueling condition for extended periods;
- b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and
- c. Adequate DC electrical power is provided to mitigate events postulated during shutdown, such as ~~an inadvertent draindown of the vessel or~~ a fuel handling accident.

The DC sources satisfy Criterion 3 of the NRC Policy Statement.

LCO The Unit 3 DC electrical power subsystems, with each DC subsystem consisting of two 125 V station batteries in series, two battery chargers (one per battery), and the corresponding control equipment and interconnecting cabling supplying power to the associated bus, are required to be

(continued)

BASES

LCO
(continued)

OPERABLE to support Unit 3 DC distribution subsystems required OPERABLE by LCO 3.8.8, "Distribution Systems—Shutdown." When the equipment required OPERABLE: 1) does not require 250 VDC from the DC electrical power subsystem; and 2) does not require 125 VDC from one of the two 125 V batteries of the DC electrical power subsystem, the Unit 3 DC electrical power subsystem requirements can be modified to only include one 125 V battery (the battery needed to provide power to required equipment), an associated battery charger, and the corresponding control equipment and interconnecting cabling supplying 125 V power to the associated bus. This exception is allowed only if all 250 VDC loads are removed from the associated bus. In addition, DC control power (which provides control power for the 4 kV load circuit breakers and the feeder breakers to the 4 kV emergency bus) for two of the four 4 kV emergency buses, as well as control power for two of the diesel generators, is provided by the Unit 2 DC electrical power subsystems. Therefore, the Unit 2 DC electrical power subsystems needed to support required components are also required to be OPERABLE. The Unit 2 DC electrical power subsystem OPERABILITY requirements are the same as those required for a Unit 3 DC electrical power subsystem. In addition, battery chargers (Unit 2 and Unit 3) can be powered from the opposite unit's AC source (as described in the Background section of the Bases for LCO 3.8.4, "DC Sources—Operating"), and be considered OPERABLE for the purpose of meeting this LCO.

This requirement ensures the availability of sufficient DC electrical power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents and inadvertent reactor vessel draindown).

APPLICABILITY

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

core cooling

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

(continued)

BASES

APPLICABILITY
(continued)

- b. Required features needed to mitigate a fuel handling accident are available;
- c. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and
- d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The DC electrical power requirements for MODES 1, 2, and 3 are covered in LCO 3.8.4.

ACTIONS

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

and

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

If more than one DC distribution subsystem is required according to LCO 3.8.8, the DC electrical power subsystems remaining OPERABLE with one or more DC electrical power subsystems inoperable may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS, fuel movement, and operations with a potential for draining the reactor vessel.

By allowance of the option to declare required features inoperable with associated DC electrical power subsystems inoperable, appropriate restrictions are implemented in accordance with the affected system LCOs' ACTIONS. However, in many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies in secondary containment, and any activities that could result in inadvertent draining of the reactor vessel).

(continued)

BASES

and

ACTIONS

~~A.1, A.2.1, A.2.2, A.2.3, and A.2.4~~ (continued)

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required DC electrical power subsystems and to continue this action until restoration is accomplished in order to provide the necessary DC electrical power to the plant safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required DC electrical power subsystems should be completed as quickly as possible in order to minimize the time during which the plant safety systems may be without sufficient power.

SURVEILLANCE
REQUIREMENTS

SR 3.8.5.1

SR 3.8.5.1 requires performance of all Surveillances required by SR 3.8.4.1 through SR 3.8.4.8. Therefore, see the corresponding Bases for LCO 3.8.4 for a discussion of each SR.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DC electrical power subsystems from being discharged below their capability to provide the required power supply or otherwise rendered inoperable during the performance of SRs. It is the intent that these SRs must still be capable of being met, but actual performance is not required.

SR 3.8.5.2

This Surveillance is provided to direct that the appropriate Surveillances for the required Unit 2 DC electrical power subsystems are governed by the Unit 2 Technical Specifications. Performance of the applicable Unit 2 Surveillances will satisfy Unit 2 requirements, as well as satisfying this Unit 3 Surveillance Requirement. The Frequency required by the applicable Unit 2 SR also governs performance of that SR for Unit 3.

(continued)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.8 Distribution Systems—Shutdown

BASES

BACKGROUND A description of the AC and DC electrical power distribution system is provided in the Bases for LCO 3.8.7, "Distribution Systems—Operating."

APPLICABLE SAFETY ANALYSES The initial conditions of Design Basis Accident and transient analyses in the UFSAR, Chapter 14 (Ref. 1), assume Engineered Safety Feature (ESF) systems are OPERABLE. The AC and DC electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the AC and DC electrical power distribution system is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum AC and DC electrical power sources and associated power distribution subsystems during MODES 4 and 5 and during movement of irradiated fuel assemblies in the secondary containment ensures that:

- a. The facility can be maintained in the shutdown or refueling condition for extended periods;
- b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and
- c. Adequate power is provided to mitigate events postulated during shutdown, such as ~~an inadvertent draindown of the vessel or~~ a fuel handling accident.

The AC and DC electrical power distribution systems satisfy Criterion 3 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO Various combinations of subsystems, equipment, and components are required OPERABLE by other LCOs, depending on the specific plant condition. Implicit in those requirements is the required OPERABILITY of necessary support required features. This LCO explicitly requires energization of the portions of the Unit 3 electrical distribution system necessary to support OPERABILITY of Technical Specifications required systems, equipment, and components—both specifically addressed by their own LCO, and implicitly required by the definition of OPERABILITY. In addition some components that may be required by Unit 3 receive power through Unit 2 electrical power distribution subsystems (e.g., Standby Gas Treatment System, Main Control Room Emergency Ventilation System, and DC control power for two of the four 4 kV emergency buses, as well as control power for two of the diesel generators). Therefore, Unit 2 AC and DC electrical power distribution subsystems needed to support the required equipment must also be OPERABLE.

In addition, it is acceptable for required buses to be cross-tied during shutdown conditions, permitting a single source to supply multiple redundant buses, provided the source is capable of maintaining proper frequency (if required) and voltage.

Maintaining these portions of the distribution system energized ensures the availability of sufficient power to operate the plant in a safe manner to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents and inadvertent reactor vessel draindown).

APPLICABILITY

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

that provide core cooling

- a. ~~Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core in case of an inadvertent draindown of the reactor vessel;~~
- b. Systems needed to mitigate a fuel handling accident are available;

(continued)

BASES

APPLICABILITY
(continued)

- c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and
- d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC and DC electrical power distribution subsystem requirements for MODES 1, 2, and 3 are covered in LCO 3.8.7.

ACTIONS

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

and

~~A.1, A.2.1, A.2.2, A.2.3, A.2.4, and A.2.5~~

and

Although redundant required features may require redundant electrical power distribution subsystems to be OPERABLE, one OPERABLE distribution subsystem may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS, fuel movement, and operations with a potential for draining the reactor vessel. By allowing the option to declare required features inoperable with associated electrical power distribution subsystems inoperable, appropriate restrictions are implemented in accordance with the affected distribution subsystem LCO's Required Actions. However, in many instances this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made, (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies in the secondary containment, and any activities that could result in inadvertent draining of the reactor vessel).

and

(continued)

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, A.2.4, and A.2.5 (continued)

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC and DC electrical power distribution subsystems and to continue this action until restoration is accomplished in order to provide the necessary power to the plant safety systems.

Notwithstanding performance of the above conservative Required Actions, a required residual heat removal-shutdown cooling (RHR-SDC) subsystem may be inoperable. In this case, Required Actions A.2.1 through A.2.4 do not adequately address the concerns relating to coolant circulation and heat removal. Pursuant to LCD 3.0.6, the RHR-SDC ACTIONS would not be entered. Therefore, Required Action A.2.5 is provided to direct declaring RHR-SDC inoperable, which results in taking the appropriate RHR-SDC ACTIONS.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required electrical power distribution subsystems should be completed as quickly as possible in order to minimize the time the plant safety systems may be without power.

SURVEILLANCE
REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the AC and DC electrical power distribution subsystem is functioning properly, with the buses energized. The verification of indicated power availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. This may be performed by verification of absence of low voltage alarms. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapter 14.
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BASES	unlikely	any	that could result in a draining of the RPV
APPLICABLE SAFETY ANALYSES	<p>In the event of a large primary system leak, the reactor vessel would rapidly depressurize, allowing the low pressure core cooling systems to operate. The capability of the low pressure coolant injection and core spray subsystems, as required in MODE 4 by LCO 3.5.2, "ECCS Shutdown," would be more than adequate to keep the core flooded under this low decay heat load condition. Small system leaks would be detected by leakage inspections before significant inventory loss occurred.</p>		
		RPV water level about TAF	"RPV WIC,"
			makeup
			4
	<p>For the purposes of this test, the protection provided by normally required MODE 4 applicable LCOs, in addition to the secondary containment requirements required to be met by this Special Operations LCO, will ensure acceptable consequences during normal hydrostatic test conditions and during postulated accident conditions.</p>		
	<p>As described in LCO 3.0.7, compliance with Special Operations LCOs is optional, and therefore, no criteria of the NRC Policy Statement apply. Special Operations LCOs provide flexibility to perform certain operations by appropriately modifying requirements of other LCOs. A discussion of the criteria satisfied for the other LCOs is provided in their respective Bases.</p>		
LCO	<p>As described in LCO 3.0.7, compliance with this Special Operations LCO is optional. Operation at reactor coolant temperatures > 212°F can be in accordance with Table 1.1-1 for MODE 3 operation without meeting this Special Operations LCO or its ACTIONS. This option may be required due to P/T limits, however, which require testing at temperatures > 212°F, while the ASME inservice test itself requires the safety/relief valves to be gagged, preventing their OPERABILITY. Additionally, even with required minimum reactor coolant temperatures < 212°F, RCS temperatures may drift above 212°F during the performance of inservice leak and hydrostatic testing or during subsequent control rod scram time testing, which is typically performed in conjunction with inservice leak and hydrostatic testing. While this Special Operations LCO is provided for inservice leak and hydrostatic testing, and for scram time testing initiated in conjunction with an inservice leak or hydrostatic test, parallel performance of others tests and inspections is not precluded</p>		

(continued)