NEXTera ENERGY
DUANE ARNOLD

June 9, 2017

NG-17-0093

10 CFR 50.90

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

Duane Arnold Energy Center
Docket No. 50-331
Renewed Facility Operating License No. DPR-49

License Amendment Request (TSCR-168), Application to Revise Technical Specifications to Adopt TSTF-542, "Reactor Pressure Vessel Water Inventory Control"

Pursuant to 10 CFR 50.90, NextEra Energy Duane Arnold, LLC (NextEra) is submitting a request for an amendment to the Technical Specifications (TS) for the Duane Arnold Energy Center (DAEC). The proposed change replaces existing Technical Specifications 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.

Attachment 1 provides a description and assessment of the proposed changes. Attachment 2 provides the existing TS pages marked to show the proposed changes. Attachment 3 provides revised (clean) TS pages. Attachment 4 provides existing TS Bases pages marked to show the proposed changes for information only.

NextEra requests approval of the proposed amendment by June 1, 2018. Once approved, the amendment shall be implemented within 90 days.

In accordance with 10 CFR 50.91, a copy of this application, with enclosures, is being provided to the designated State of Iowa official.

As discussed in Attachment 1, the proposed change does not involve a significant hazards consideration pursuant to 10 CFR 50.92, and there are no significant environmental impacts associated with the change. The DAEC Onsite Review Group has reviewed the proposed license amendment request.

This letter contains no new or revised regulatory commitments.

If you have any questions or require additional information, please contact J. Michael Davis, Licensing Manager, at 319-851-7032.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 9, 2017

Dean Curtland
Director, Site Operations
NextEra Energy Duane Arnold, LLC

Attachments: 1. Description and Assessment
2. Proposed Technical Specification Changes (Mark-Up)
3. Revised Technical Specification Pages
4. Proposed Technical Specification Bases Changes (Mark-Up)

cc: Regional Administrator, USNRC, Region III,
Project Manager, USNRC, Duane Arnold Energy Center
Resident Inspector, USNRC, Duane Arnold Energy Center
A. Leek (State of Iowa)

ATTACHMENT 1 - DESCRIPTION AND ASSESSMENT

1.0 DESCRIPTION

The proposed change replaces existing Technical Specifications (TS) requirements related to "operations which have the 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

NextEra Energy Duane Arnold, LLC (NextEra) has reviewed the safety evaluation provided to the Technical Specifications Task Force (TSTF) on December 20, 2016, as well as the information provided in TSTF-542. NextEra has concluded that the justifications presented in TSTF-542 and the safety evaluation prepared by the NRC staff are applicable to the Duane Arnold Energy Center (DAEC) and justify this amendment for incorporation of the changes to the DAEC TS.

The following DAEC TS references are related to OPDRVs and are affected by the proposed change:

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	Standby Filter Unit 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/Dampers (SCIV/Ds)
3.6.4.3	Standby Gas Treatment (SGT) System
3.7.4	Standby Filter Unit System (SFU) System
3.7.5	Control Building Chiller (CBC) System
3.8.2	AC Sources - Shutdown
3.8.5	DC Sources - Shutdown
3.8.8	Distribution Systems - Shutdown

2.2 Variations

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

a. The DAEC TS utilize different numbering and titles than the Standard TS on which TSTF-542 was based. The table below shows the differences between the plant-specific TS numbering and titles and the TSTF-542 numbering and titles. These differences are administrative and do not affect the applicability of TSTF-542 to the DAEC TS.

TSTF-542 TS Numbering and Titles		**DAEC TS Numbering and Titles**	
TS 3.3.7.1	[Main Control Room Environmental Control (MCREC)] System Instrumentation	TS 3.3.7.1	Standby Filer Unit (SFU) System Instrumentation
TS 3.6.4.2	Secondary Containment Isolation Valves (SCIVs)	TS 3.6.4.2	Secondary Containment Isolation Valves/Dampers(SCIV/Ds)
TS 3.7.4	[Main Control Room Environmental Control (MCREC)] System	TS 3.7.4	Standby Filter Unit (SFU) System
TS 3.7.5	[Control Room Air Conditioning (AC)] System	TS 3.7.5	Control Building Chiller (CBC) System
TS 3.8.10	Distribution Systems - Shutdown	TS 3.8.8	Distribution Systems - Shutdown

b. TS 3.5.2, Reactor Pressure Vessel Water Inventory Control, in TSTF-542 includes a note regarding manual realignment to the low pressure coolant injection (LPCI) mode that modifies the limiting condition for operation (LCO). The note allows a required LPCI subsystem to be considered operable during alignment and operation for decay heat removal if capable of being manually realigned to the LPCI mode and not otherwise inoperable. In the DAEC TS, the same note modifies surveillance requirement (SR) 3.5.2.4, which verifies that each power operated and automatic valve that is not locked, sealed or otherwise secured in position is in its correct position, rather than the LCO. By modifying the SR, the note allows a required LPCI subsystem to be considered operable during alignment and operation for decay heat removal if capable of being manually realigned to the LPCI mode and not otherwise inoperable. While the location of the note in the DAEC TS is different from TSTF-542, the note serves the same purpose. Therefore, this difference has no effect on the adoption of TSTF-542 and is acceptable.

c. TSTF-542 and the associated safety evaluation discuss the applicable regulatory requirements and guidance, including the 10 CFR 50, Appendix A, General Design Criteria (GDC). DAEC was not licensed to the 10 CFR 50, Appendix A, GDC. The DAEC Updated Final Safety Analysis Report, section 3.1, contains an evaluation of the DAEC design basis as measured against the AEC General Design Criteria (GDC) for nuclear power plants, Appendix A, of 10 CFR 50 effective May 21, 1971, and subsequently amended July 7, 1971.

This difference does not alter the conclusion that the proposed change is applicable to DAEC.

d. The DAEC TS contain a Surveillance Frequency Control Program (SFCP). Therefore, the SR Frequencies for Specifications 3.3.5.2 and 3.5.2 are "In accordance with the Surveillance Frequency Control Program." For new SRs added by this proposed amendment, the SFCP will initially establish Frequencies consistent with those specified in TSTF-542.

e. DAEC TS 3.6.1.3, PCIVs, is currently applicable in Modes 1, 2, and 3, and Modes 4 and 5 for the shutdown cooling system isolation valves when required by LCO 3.3.6.1, "Primary Containment Isolation Instrumentation." However, TSTF-542 deletes from Table 3.3.6.1-1 the Modes 4 and 5 requirement for shutdown cooling system isolation. As a result, TS 3.6.1.3 will no longer require any PCIVs to be operable in Modes 4 or 5. Therefore, NextEra proposes to revise the Applicability to Modes 1, 2, and 3 and delete LCO Condition G, which is applicable in Modes 4 and 5, and the associated Required Actions from TS 3.6.1.3. In addition, the unnecessary reference to Modes 1, 2, or 3 in Condition F is deleted since LCO 3.6.1.3 is applicable only in Modes 1, 2 and 3. These changes are administrative in nature and are justified on the basis that TSTF-542 removed the Mode 4 and 5 Applicability from LCO 3.6.1.3.

f. DAEC does not have the capability to perform channel checks for the following functions in proposed Table 3.3.5.2-1, "RPV Water Inventory Control Instrumentation": Function 1.a, "Reactor Steam Dome Pressure - Low (Injection Permissive)," Function 1.b, "Core Spray Pump Discharge Flow - Low (Bypass)," Function 2.a, "Reactor Steam Dome Pressure - Low (Injection Permissive)," and Function 2.b, "Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)." The current TS do not include channel checks for these functions and similarly, channel checks are not included for these functions in proposed Table 3.3.5.2-1.

g. The DAEC LPCI system consists of two loops with two pumps in each loop. Function 2.f, "Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)," in current TS Table 3.3.5.1-1 requires one operable channel per loop. NextEra proposes to include the one channel per loop requirement for Function 2.b in proposed Table 3.3.5.2-1 rather than one channel per pump as included in TSTF-542 because each LPCI loop has only one flow instrument.

h. DAEC current TS 3.6.4.1, "Secondary Containment," and TS 3.6.4.3, "Standby Gas Treatment System," are applicable in Modes 1, 2, and 3, and during OPDRVs. Consistent with TSTF-542, the applicability during OPDRVs is removed, so the TS applicability becomes Modes 1, 2, and 3. Condition A in TS 3.6.4.1 and Conditions B and D in TS 3.6.4.3 apply to conditions that occur in Modes 1, 2, and 3; e.g., secondary containment inoperable in Mode 1, 2, or 3. Since the applicability of these TS is changed to Modes 1, 2, and 3, it is no longer necessary for the Conditions to repeat the applicability. Therefore, NextEra proposes to remove the words "in MODE 1, 2, or 3" from Condition A in TS 3.6.4.1 and Conditions B and D in TS 3.6.4.3. This is an administrative change that does not affect the applicability of TSTF-542 to the DAEC TS.

i. DAEC TS Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation," does not include functions for manual initiation of CS and LPCI. Since the design does not include this feature, proposed Table 3.3.5.2-1 does not include manual initiation functions for CS and LPCI. In addition, TS 3.3.5.2 does not include a surveillance requirement (SR) for a logic system functional test since the SR applies only to the manual initiation function. Likewise, the changes to TS 3.5.2, RPV Water Inventory Control, do not include SR 3.5.2.8, which demonstrates ECCS injection/spray actuation on a manual initiation signal.

j. DAEC TS LCO 3.3.6.1 currently requires Shutdown Cooling System (SDC) Isolation on reactor vessel water level-low in Modes 3, 4, and 5. TSTF-542 deletes the Modes 4 and 5 requirement for this function and includes this function in new TS 3.3.5.2 with an Applicability of "When automatic isolation of the associated penetration flow path(s) is credited in calculating DRAIN TIME." However, TS 3.3.6.1 retains the Applicability of Mode 3 for SDC Isolation to prevent this potential flow path from lowering the reactor vessel level to the top of the fuel in Mode 3.

   The current TS 3.3.6.1 Required Actions for inoperability of this function are J.1, immediately initiate action to restore the channel to operable status; or J.2, immediately initiate action to isolate the Residual Heat Removal (RHR) Shutdown Cooling System. TSTF-542 deletes Required Action J.2; however, NextEra proposes to retain Required Action J.2 to account for SDC system isolation in Mode 3. Since Required Action J.2 currently applies in Modes 3, 4, and 5 and TSTF-542 deletes only the Modes 4 and 5 applicability; retaining the Required Action for application in Mode 3 is appropriate.

The DAEC TS contain requirements that differ from the Standard Technical Specifications on which TSTF-542 was based, but are encompassed in the TSTF-542 justification:

- There are DAEC specific instrumentation functions that differ from the Standard Technical Specifications (STS). DAEC TS Table 3.3.5.1-1 includes Functions 1.f and 2.k, 4.16 kV emergency bus sequential loading relay for the core spray (CS) and low-pressure coolant injection (LPCI) systems, which are applicable in Modes 1 through 5. These functions withhold the start permissive signal from the circuits that start the CS and LPCI pumps during accident conditions if an undervoltage condition exists on an emergency bus. These functions are unnecessary for manual operation; therefore, the Modes 4 and 5 Applicability of these functions can be eliminated because the ECCS subsystem required by TS 3.5.2 in Modes 4 and 5 is proposed to be started by manual operation.

  DAEC TS Table 3.3.5.1-1 also includes Function 1.e, "Core Spray Pump Start Time Delay Relay," which is required in Modes 1 through 5. The purpose of the time delay relay is to stagger the start of the CS pumps to limit the transient on the 4.16 kV emergency buses, similar to the purpose of the LPCI time delay relays in STS Table 3.3.5.1-1, Function 2.f. Changes to this instrumentation function are justified by the discussion in Section 3.4.1 of the TSTF-542 justification. This staggering is unnecessary for manual operation of the ECCS subsystem required by TS 3.5.2 in Modes 4 and 5 ; therefore, the requirement for this function in Modes 4 and 5 can be removed from the TS.

3.0 REGULATORY ANALYSIS

3.1 No Significant Hazards Consideration Analysis

NextEra Energy Duane Arnold, LLC (NextEra) requests adoption of TSTF-542 "Reactor Pressure Vessel Water Inventory Control," which is an approved change to the Standard Technical Specifications (STS), into the Duane Arnold Energy Center Technical Specifications (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.

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

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

   Response: No

   The proposed change replaces 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 change reduces 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 change reduces 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 change reduces or eliminates 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 change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   Response: No

   The proposed change replaces existing TS requirements related to OPDRVs with new requirements on RPV WIC that will protect Safety Limit 2.1.1.3. The proposed change will not alter the design function of the equipment involved. Under the proposed change, 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 change is an unexpected draining event. The proposed change does 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 change does not create the possibility of a new or different kind of accident from any previously evaluated.

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

   Response: No

   The proposed change replaces 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 change does not involve a significant reduction in a margin of safety.

Based on the above, NextEra concludes that the proposed change 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 EVALUATION

The proposed change 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 change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change 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 change.

ATTACHMENT 2 to NG-17-0093

Proposed Technical Specification Changes (Mark-Up)

46 Pages Follow

1.1 Definitions (continued)

CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific limits shall be determined for each reload cycle in accordance with Specification 5.6.5. Plant operation within these limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/ml), that alone would produce the same dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The dose conversion factors used for this calculation shall be those listed in Federal Guidance Report (FGR) 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," 1989 and FGR 12, "External Exposure to Radionuclides in Air, Water, and Soil," 1993.
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 actuation of the breaker secondary (auxiliary) contact. 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.

INSERT 1 →

(continued)

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 is in continuous communication with the control room, is stationed at the controls, and is capable of closing the penetration flow path isolation device without offsite power.

c) The penetration flow paths required to be evaluated per paragraph b) are assumed to open instantaneously and are not subsequently isolated, and no water is assumed to be subsequently added to the RPV water inventory;

d) No additional draining events occur; and

e) Realistic cross-sectional areas and drain rates are used.

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. As required by Required Action A.1 and referenced in Table 3.3.5.1-1	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. ---------- Declare supported feature(s) inoperable when redundant feature(s) ECCS initiation capability is inoperable.	1 hour from discovery of loss of initiation capability for feature(s) in two or more low pressure ECCS subsystems
	AND	
	B.2 ----------NOTE---------- Only applicable for Functions 3.a and 3.b. ---------- Declare High Pressure Coolant Injection (HPCI) System inoperable.	1 hour from discovery of loss of HPCI initiation capability
	AND	
	B.3 Place channel in trip.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	C.1 ----------NOTES---------- ~~1. Only applicable in MODES 1, 2, and 3.~~ ~~2.~~ Only applicable for Functions 1.c, 1.e, 2.c and 2.e. ---------- Declare supported feature(s) inoperable.	1 hour from discovery of loss of initiation capability for two or more low pressure ECCS subsystems
	AND	
	C.2 ----------NOTES---------- ~~1. Only applicable in Modes 1, 2, and 3.~~ ~~2.~~ Only applicable for Functions 2.g, 2.h, 2.i, and 2.j. ---------- Declare Low Pressure Coolant Injection (LPCI) subsystem inoperable.	1 hour from discovery of loss of Loop Selection capability
	AND	
	C.3 Restore channel to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	E.1 ----------NOTES---------- ~~1. Only applicable in MODES 1, 2, and 3.~~ ~~2.~~ Only applicable for Functions 1.d and 2.f. ---------- Declare supported feature(s) inoperable.	1 hour from discovery of loss of initiation capability for two or more minimum flow valves in the low pressure ECCS subsystems
	AND	
	E.2 Restore channel to OPERABLE status.	7 days
F. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	F.1 Restore channel to OPERABLE status.	1 hour

(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	1,2,3, ~~4(a), 5(a)~~	4(b) a	B	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 38.3 inches
b. Drywell Pressure - High	1,2,3	4(b)	B	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 2.19 psig
c. Reactor Steam Dome Pressure – Low (Injection Permissive)	1,2,3	4	C	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 363.3 psig and ≤ 485.1 psig
	~~4(a), 5(a)~~	~~4~~	~~B~~	~~SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9~~	~~≥ 363.3 psig and ≤ 485.1 psig~~
d. Core Spray Pump Discharge Flow – Low (Bypass)	1,2,3, ~~4(a), 5(a)~~	1 per pump	E	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 256.6 gpm and ≤ 2382.1 gpm
e. Core Spray Pump Start Time Delay Relay	1,2,3, ~~4(a), 5(a)~~	1 per pump	C	SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 2.6 seconds and ≤ 6.8 seconds
f. 4.16 kV Emergency Bus Sequential Loading Relay	1,2,3, ~~4(a), 5(a)~~	1 per pump	F	SR 3.3.5.1.5 SR 3.3.5.1.6 SR 3.3.5.1.9	≤ 3500 V
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Vessel Water Level- Low Low Low	1,2,3, ~~4(a), 5(a)~~	4	B	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 38.3 inches
b. Drywell Pressure - High	1,2,3	4	B	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 2.19 psig

(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).

a

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. LPCI System (continued)					
c. Reactor Steam Dome Pressure – Low (Injection Permissive)	1,2,3	4	C	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 363.3 psig and ≤ 485.1 psig
	~~4 (a), 5 (a)~~	~~4~~	~~B~~	~~SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9~~	~~≥ 363.3 psig and ≤ 485.1 psig~~
d. Reactor Vessel Shroud Level - Low	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.9	≥ -40.89 inches
e. Low Pressure Coolant Injection Pump Start - Time Delay Relay	1,2,3, ~~4 (a), 5 (a)~~	1 per pump	C	SR 3.3.5.1.8 SR 3.3.5.1.9	
Pumps A & B					≥ 8.8 seconds and ≤ 11.2 seconds
Pumps C & D					≥ 13.8 seconds and ≤ 33.5 seconds
f. Low Pressure Coolant Injection Pump Discharge Flow – Low (Bypass)	1,2,3, ~~4 (a), 5 (a)~~	1 per loop	E	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 471.8 gpm and ≤ 3676.6 gpm
g. LPCI Loop Select-Reactor Vessel Water Level - Low-Low	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.6 SR 3.3.5.1.9	≥ 112.65 inches
h. LPCI Loop Select – Reactor Steam Dome Pressure - Low	1,2,3	4	C	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.9	≥ 887 psig

(continued)

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

Table 3.3.5.1-1 (page 3 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. LPCI System (continued)					
i. LPCI Loop Select – Recirculation Pump Differential Pressure	1,2,3	4 per pump	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 7.8 psid
j. LPCI Loop Select – Recirculation Riser Differential Pressure	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.9	≥ 0.13 psid and ≤ 2.07 psid
k. 4.16 kV Emergency Bus Sequential Loading Relay	1,2,3	2	F	SR 3.3.5.1.5 SR 3.3.5.1.6 SR 3.3.5.1.9	≤ 3500 V
	~~4(a), 5(a)~~	~~4~~	~~F~~	~~SR 3.3.5.1.5 SR 3.3.5.1.6 SR 3.3.5.1.9~~	~~≤ 3500 V~~
3. High Pressure Coolant Injection (HPCI) System					
a. Reactor Vessel Water Level - Low Low	1, 2(c), 3(c)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.6 SR 3.3.5.1.9	≥ 112.65 inches
b. Drywell Pressure - High	1, 2(c), 3(c)	4	B	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 2.19 psig
c. Reactor Vessel Water Level - High	1, 2(c), 3(c)	2	C	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.6 SR 3.3.5.1.9	≤ 214.8 inches
d. Condensate Storage Tank Level - Low	1, 2(c), 3(c)	2	D	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 11.6 inches

(continued)

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

(c) With reactor steam dome pressure > 150 psig.

b

Table 3.3.5.1-1 (page 4 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
3. HPCI System (continued)					
e. Suppression Pool Water Level – High	1, 2(c), 3(c)	2	D	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 5.9 inches
f. High Pressure Coolant Injection Pump Discharge Flow – Low (Bypass)	1, 2(c), 3(c)	1	E	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 264.2 gpm and ≤ 2025.1 gpm
4. Automatic Depressurization System (ADS) Trip Logic A					
a. Reactor Vessel Water Level - Low Low Low	1, 2(d), 3(d)	2	G	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 38.3 inches
b. Automatic Depressurization System Timer	1, 2(d), 3(d)	1	H	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 125 seconds
c. Reactor Vessel Water Level – Low (Confirmatory)	1, 2(d), 3(d)	1	G	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 166.1 inches
d. Core Spray Pump Discharge Pressure - High	1, 2(d), 3(d)	2	H	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 114.2 psig and ≤ 177.0 psig
e. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, 2(d), 3(d)	4	H	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 103.8 psig and ≤ 147.0 psig

(continued)

(e) With reactor steam dome pressure > 150 psig.

(d) With reactor steam dome pressure > 100 psig.

Table 3.3.5.1-1 (page 5 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
5. ADS Trip Logic B					
a. Reactor Vessel Water Level - Low Low Low	1, 2(d), 3(d)	2	G	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 38.3 inches
b. Automatic Depressurization System Timer	1, 2(d), 3(d)	1	H	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 125 seconds
c. Reactor Vessel Water Level – Low (Confirmatory)	1, 2(d), 3(d)	1	G	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 166.1 inches
d. Core Spray Pump Discharge Pressure - High	1, 2(d), 3(d)	2	H	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 114.2 psig and ≤ 177.0 psig
e. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, 2(d), 3(d)	4	H	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 103.8 psig and ≤ 147.0 psig

(d) With reactor steam dome pressure > 100 psig.

3.3 INSTRUMENTATION

3.3.5.2 Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation

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

APPLICABILITY: According to Table 3.3.5.2-1.

ACTIONS

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

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more channels inoperable.	A.1	Enter the Condition referenced in Table 3.3.5.2-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	B.1	Declare associated penetration flow path(s) incapable of automatic isolation.	Immediately
	AND		
	B.2	Calculate DRAIN TIME.	Immediately
C. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	C.1	Place channel in trip.	1 hour
D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	D.1	Restore channel to OPERABLE status.	24 hours

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

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

Table 3.3.5.2-1 (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 Steam Dome Pressure - Low (Injection Permissive)	4, 5	4	C	SR 3.3.5.2.2	≤ 485.1 psig
b. Core Spray Pump Discharge Flow - Low (Bypass)	4, 5	1 per pump(a)	D	SR 3.3.5.2.2	≥ 256.6 gpm and ≤ 2382.1 gpm
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Steam Dome Pressure - Low (Injection Permissive)	4, 5	4	C	SR 3.3.5.2.2	≤ 485.1 psig
b. Low Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	4, 5	1 per loop(a)	D	SR 3.3.5.2.2	≥ 471.8 gpm and ≤ 3676.6 gpm
3. RHR System Isolation					
a. Reactor Vessel Water Level - Low	(b)	2 in one trip system	B	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 165.6 inches
4. Reactor Water Cleanup (RWCU) System Isolation					
a. Reactor Vessel Water Level - Low Low,	(b)	2 in one trip system	B	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 112.65 inches

(a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.2, "Reactor Pressure Vessel Water Inventory Control."
(b) When automatic isolation of the associated penetration flow path(s) is credited in calculating DRAIN TIME.

3.3 INSTRUMENTATION

3.3.5.2 Reactor Core Isolation Cooling (RCIC) System Instrumentation

LCO 3.3.5.2 The RCIC System instrumentation for each Function in Table 3.3.5.2-1 shall be OPERABLE.

3

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

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 3.3.5.2-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	B.1 Declare RCIC System inoperable. AND B.2 Place channel in trip.	1 hour from discovery of loss of RCIC initiation capability 24 hours

3

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. As required by Required Action A.1 and referenced in Table 3.3.5.~~2~~-1.	C.1 Restore channel to OPERABLE status.	24 hours
D. As required by Required Action A.1 and referenced in Table 3.3.5.~~2~~-1. 3	D.1 ----------NOTE---------- Only applicable if RCIC pump suction is not aligned to the suppression pool. ---------- Declare RCIC System inoperable.	1 hour from discovery of loss of RCIC suction transfer capability
	AND	
	D.2.1 Place channel in trip.	24 hours
	OR	
	D.2.2 Align RCIC pump suction to the suppression pool.	24 hours
E. Required Action and associated Completion Time of Condition B, C, or D not met.	E.1 Declare RCIC System inoperable.	Immediately

3

SURVEILLANCE REQUIREMENTS

3

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

1. Refer to Table 3.3.5.~~2~~-1 to determine which SRs apply for each RCIC Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 2 and 3; and (b) for up to 6 hours for Function 1 provided the associated Function maintains RCIC initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.~~2~~.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.~~2~~.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.~~2~~.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.~~2~~.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.~~2~~.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

3

3

3

Table 3.3.5.~~2~~-1 (page 1 of 1)
Reactor Core Isolation Cooling System Instrumentation

FUNCTION	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level – Low Low	4	B	~~SR 3.3.5.2.1~~ ~~SR 3.3.5.2.2~~ ~~SR 3.3.5.2.3~~ ~~SR 3.3.5.2.5~~	≥ 112.65 inches
2. Reactor Vessel Water Level - High	2	C	~~SR 3.3.5.2.1~~ ~~SR 3.3.5.2.2~~ ~~SR 3.3.5.2.3~~ ~~SR 3.3.5.2.5~~	≤ 214.8 inches
3. Condensate Storage Tank Level - Low	2	D	~~SR 3.3.5.2.2~~ ~~SR 3.3.5.2.4~~ ~~SR 3.3.5.2.5~~	≥ 11.6 inches

SR 3.3.5.3.1
SR 3.3.5.3.2
SR 3.3.5.3.3
SR 3.3.5.3.5

SR 3.3.5.3.2
SR 3.3.5.3.4
SR 3.3.5.3.5

Table 3.3.6.1-1 (page 5 of 5)
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. Differential Flow - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 59 gpm
b. Area Temperature - High	1,2,3	1[(d)]	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 133.3°F
c. Area Ventilation Differential Temperature – High	1,2,3	1[(d)]	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	
RWCU Pump Room RWCU Pump A Room RWCU Pump B Room RWCU Heat Exch. Room					≤ 22.5°F ≤ 23.5°F ≤ 34.5°F ≤ 51.5°F
d. SLC System Initiation	1,2	1[(e)]	I	SR 3.3.6.1.9	NA
e. Reactor Vessel Water Level – Low Low	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.4 SR 3.3.6.1.7 SR 3.3.6.1.9	≥ 112.65 inches
f. Area Near TIP Room Ambient Temperature – High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 115.7°F
6. Shutdown Cooling System Isolation					
a. Reactor Steam Dome Pressure - High	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.9	≤ 152.7 psig
b. Reactor Vessel Water Level – Low	3,~~4,5~~	2[~~(f)~~]	J	SR 3.3.6.1.1 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 165.6 inches
c. Drywell Pressure – High	1,2,3	2	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 2.2 psig
7. Containment Cooling System Isolation					
a. Containment Pressure – High	1,2,3	4	K	SR 3.3.6.1.3 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 1.25 psig

(d) Each Trip System must have either an OPERABLE Function 5.b or an OPERABLE Function 5.c channel in both the RWCU pump area and in the RWCU heat exchanger area.

(e) SLC System Initiation only inputs into one of the two trip systems.

~~(f) Only one trip system required in MODES 4 and 5 when RHR Shutdown Cooling System integrity maintained.~~

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	1,2,3, ~~(a)~~	2	SR 3.3.6.2.1 SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	≥ 165.6 inches
2. Drywell Pressure - High	1,2,3	2	SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	≤ 2.2 psig
3. Reactor Building Exhaust Shaft – High Radiation	1,2,3, ~~(a)~~	1	SR 3.3.6.2.2 SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	≤ 12.8 mR/hr
4. Refueling Floor Exhaust Duct – High Radiation	1,2,3, ~~(a)~~	1	SR 3.3.6.2.2 SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	≤ 10.6 mR/hr

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

3.3 INSTRUMENTATION

3.3.7.1 Standby Filter Unit (SFU) System Instrumentation

LCO 3.3.7.1 Two channels of the Control Building Intake Area 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 both channels inoperable.	A.1 Declare associated SFU subsystem(s) inoperable. OR A.2 Place associated SFU subsystem(s) in the isolation mode.	1 hour 1 hour

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 four 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 Residual Heat Removal (RHR) pump inoperable.	A.1 Restore RHR pump to OPERABLE status.	30 Days
B. One low pressure ECCS subsystem inoperable for reasons other than Condition A.	B.1 Restore low pressure ECCS subsystem to OPERABLE status.	7 days
C. One Core Spray subsystem inoperable. AND One or two RHR pump(s) inoperable.	C.1 Restore Core Spray subsystem to OPERABLE status. OR C.2 Restore RHR pump(s) to OPERABLE status.	72 hours 72 hours
D. Both Core Spray subsystems inoperable.	D.1 Restore one Core Spray subsystem to OPERABLE status.	72 hours

(continued)

DRAIN TIME of RPV water inventory to the top of active fuel (TAF) shall be ≥ 36 hours.
.
AND
.
One

RPV Water Inventory Control

~~ECCS — Shutdown~~
3.5.2
, RPV WATER INVENTORY CONTROL, AND

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

3.5.2 ~~ECCS — Shutdown~~ Reactor Pressure Vessel (RPV) Water Inventory Control

LCO 3.5.2 ~~Two~~ low pressure ECCS subsystem~~s~~ shall be OPERABLE.

APPLICABILITY: ~~MODE 4,~~ MODES 4 and 5
~~MODE 5, except with the spent fuel storage pool gates removed and water level ≥ 21 ft 1 inch over the top of the reactor pressure vessel flange.~~

ACTIONS

	CONDITION		REQUIRED ACTION	COMPLETION TIME
Required				
A.	~~One required~~ ECCS subsystem inoperable.	A.1	Restore required ECCS subsystem to OPERABLE status.	4 hours
B.	Required Action and associated Completion Time of Condition A not met.	B.1	~~Initiate action to suspend Operations With a Potential for Draining the Reactor Vessel (OPDRVs).~~ Initiate action to establish a method of water injection capable of operating without offsite electrical power.	Immediately
~~C.~~	~~Both required ECCS subsystems inoperable.~~	~~C.1~~	~~Initiate action to suspend OPDRVs.~~	~~Immediately~~
		~~AND~~		
		~~C.2~~	~~Restore one ECCS subsystem to OPERABLE status.~~	~~4 hours~~

INSERT C (3.5.2)

(continued)

INSERT C (3.5.2)

C. DRAIN TIME < 36 hours and ≥ 8 hours.	C.1	Verify secondary containment boundary is capable of being established in less than the DRAIN TIME.	4 hours
	AND		
	C.2	Verify each secondary containment penetration flow path is capable of being isolated in less than the DRAIN TIME.	4 hours
	AND		
	C.3	Verify one standby gas treatment subsystem is capable of being placed in operation in less than the DRAIN TIME.	4 hours

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 to OPERABLE status.~~	~~Immediately~~
	~~AND~~	
	~~D.3~~ ~~Initiate action to restore isolation capability in each required Secondary Containment penetration flow path not isolated.~~	~~Immediately~~

INSERT D (3.5.2)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.~~1~~ 2	Verify, for ~~each~~ a required Low Pressure Coolant Injection (LPCI) subsystem, the suppression pool water level is ≥ 7.0 ft.	In accordance with the Surveillance Frequency Control Program

(continued)

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

INSERT D (3.5.2)

D. DRAIN TIME < 8 hours.	D.1	---------- NOTE ---------- Required ECCS injection/spray subsystem or additional method of water injection shall be capable of operating without offsite electrical power. ----------	
		Initiate action to establish an additional method of water injection with water sources capable of maintaining RPV water level > TAF for ≥ 36 hours.	Immediately
	AND		
	D.2	Initiate action to establish secondary containment boundary.	Immediately
	AND		
	D.3	Initiate action to isolate each secondary containment penetration flow path or verify it can be manually isolated from the control room.	Immediately
	AND		
	D.4	Initiate action to verify one standby gas treatment subsystem is capable of being placed in operation.	Immediately
E. Required Action and associated Completion Time of Condition C or D not met. OR DRAIN TIME < 1 hour.	E.1	Initiate action to restore DRAIN TIME to ≥ 36 hours.	Immediately

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.~~2~~ 3	Verify, for ~~each~~ a required Core Spray (CS) subsystem, the: a. Suppression pool water level is ≥ 8.0 ft; or b. ~~NOTE Only one required CS subsystem may take credit for this option during OPDRVs.~~ Condensate storage tank water level in one CST is ≥ 11 ft or ≥ 7 ft in both CSTs.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.~~3~~ 4	Verify, for ~~each~~ the required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.~~4~~ 5	A ----------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. ---------- ----------NOTE---------- Not required to be met for system vent flow paths opened under administrative control. ---------- Verify ~~each~~ for the required ECCS subsystem , each power operated and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.5.2.5	~~Verify each required ECCS pump develops the specified flow rate against a system head corresponding to the specified reactor pressure.~~ Operate the required ECCS injection/ spray subsystem through the recirculation line for ≥ 10 minutes.	In accordance with the Inservice Testing Program

~~SYSTEM~~	~~FLOW RATE~~	~~NO. OF PUMPS~~	~~SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF~~
~~CS~~	~~≥ 2718 gpm~~	~~1~~	~~≥ 113 psig~~
~~LPCI~~	~~≥ 4320 gpm~~	~~1~~	~~≥ 20 psig~~

~~SR 3.5.2.6~~	~~NOTES~~ ~~1. Vessel injection/spray may be excluded.~~ ~~2. For the LPCI System, the surveillance may be met by any series of sequential and/or overlapping steps, such that the LPCI Loop Select function is tested.~~ ~~Verify each required ECCS subsystem actuates on an actual or simulated automatic initiation signal.~~	~~In accordance with the Surveillance Frequency Control Program~~

SR 3.5.2.7 Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.

In accordance with the Surveillance Frequency Control Program

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. AND A.2 Restore RCIC System to OPERABLE status.	Immediately 14 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Reduce reactor steam dome pressure to ≤ 150 psig.	12 hours 36 hours

3.6 CONTAINMENT SYSTEMS

3.6.1.3 Primary Containment Isolation Valves (PCIVs)

LCO 3.6.1.3 Each PCIV, except reactor building-to-suppression chamber vacuum breakers, shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3
~~MODES 4 and 5 for Shutdown Cooling System Isolation Valves when the associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation."~~

ACTIONS

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

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

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. (continued)	E.3 ----------NOTES---------- 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------- Verify the affected penetration flow path is isolated.	Once per 31 days for isolation device outside containment
F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met ~~in MODE 1, 2, or 3.~~	F.1 Be in MODE 3. AND F.2 Be in MODE 4.	12 hours 36 hours
~~G. Required Action and associated Completion Time of Condition A, B, C, D, or E not met for PCIV(s) required to be OPERABLE during MODE 4 or 5.~~	~~G.1 Initiate action to suspend OPDRVs within the Residual Heat Removal (RHR) Shutdown Cooling System.~~ ~~OR~~ ~~G.2 Initiate action to restore valve(s) to OPERABLE status.~~	~~Immediately~~ ~~Immediately~~

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 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. AND B.2 Be in MODE 4.	12 hours 36 hours
~~C. Secondary containment inoperable during OPDRVs.~~	~~C.1 NOTE LCO 3.0.3 is not applicable.~~ ~~Initiate action to suspend OPDRVs.~~	~~Immediately~~

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.4.2 Secondary Containment Isolation Valves/Dampers (SCIV/Ds)

LCO 3.6.4.2 Each SCIV/D shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
~~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 SCIV/Ds.

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~D. Required Action and associated Completion Time of Condition A or B not met during OPDRVs.~~	~~D.1 NOTE LCO 3.0.3 is not applicable.~~ ~~Initiate action to suspend OPDRVs.~~	~~Immediately~~

3.6 CONTAINMENT SYSTEMS

3.6.4.3 Standby Gas Treatment (SBGT) System

LCO 3.6.4.3 Two SBGT subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
~~During Operations with a Potential for Draining the Reactor Vessel (OPDRVs).~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SBGT subsystem inoperable.	A.1 Restore SBGT 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. AND B.2 Be in MODE 4.	12 hours 36 hours
~~C. Required Action and associated Completion Time of Condition A not met during OPDRVs.~~	~~NOTE LCO 3.0.3 is not applicable.~~ ~~C.1 Place OPERABLE SBGT subsystem in operation.~~ ~~OR~~	~~Immediately~~ (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~C.~~ ~~(continued)~~	~~C.2~~ ~~Initiate action to suspend OPDRVs.~~	~~Immediately~~
~~D.~~ Two SBGT subsystems inoperable ~~in MODE 1, 2, or 3~~.	~~D~~.1 Enter LCO 3.0.3.	Immediately
~~E.~~ ~~Two SBGT subsystems inoperable during OPDRVs.~~	~~E.1~~ ~~NOTE LCO 3.0.3 is not applicable.~~ ~~Initiate action to suspend OPDRVs.~~	~~Immediately~~

(continued)

3.7 PLANT SYSTEMS

3.7.4 Standby Filter Unit (SFU) System

LCO 3.7.4 Two SFU subsystems shall be OPERABLE.

---NOTE---
The control building envelope (CBE) 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 SFU subsystem inoperable for reasons other than Condition B.	A.1 Restore SFU subsystem to OPERABLE status.	7 days
B. One or more SFU subsystems inoperable due to inoperable CBE boundary in MODES 1, 2, and 3.	B.1 Initiate actions to implement mitigating actions. AND B.2 Verify mitigating actions ensure CBE occupant exposures to radiological hazards will not exceed limits and verify by administrative means that CBE occupants are protected from smoke and chemical hazards. AND B.3 Restore CBE boundary to OPERABLE status.	Immediately 24 hours 90 days

(continued)

ACTIONS (continued)

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. AND C.2 Be in MODE 4.	12 hours 36 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~~.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- D.1 Place OPERABLE SFU subsystem in the isolation mode. OR D.2.1 Suspend movement of irradiated fuel assemblies in the secondary containment. AND D.2.2 Suspend CORE ALTERATIONS. ~~AND~~ ~~D.2.3 Initiate action to suspend OPDRVs.~~	 Immediately Immediately Immediately ~~Immediately~~
E. Both SFU subsystems inoperable in MODE 1, 2 or 3 for reasons other than Condition B.	E.1 Enter LCO 3.0.3	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Both SFU subsystems inoperable during movement of irradiated fuel assembles in the secondary containment~~,~~ during CORE ALTERATIONS, ~~or during OPDRVs~~.	----------NOTE---------- LCO 3.0.3 is not applicable. ----------	
	F.1 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
OR	AND	
One or more SFU subsystems inoperable due to an inoperable CBE boundary during movement of irradiated fuel assemblies in the secondary containment~~,~~ during CORE ALTERATIONS~~,~~ ~~or during OPDRVs.~~	F.2 Suspend CORE ALTERATIONS.	Immediately
	~~AND~~	
	~~F.3 Initiate action to suspend OPDRVs.~~	~~Immediately~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Operate each SFU subsystem for ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.7.4.2	Perform required SFU filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP

(continued)

3.7 PLANT SYSTEMS

3.7.5 Control Building Chiller (CBC) System

LCO 3.7.5 Two CBC subsystems 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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CBC subsystem inoperable.	A.1 Restore CBC subsystem to OPERABLE status.	30 days
B. Two CBC subsystems inoperable.	B.1 Verify control building area temperatures < 90°F. AND B.2 Restore one CBC subsystem to OPERABLE status.	Once per 4 hours 72 hours
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. AND C.2 Be in MODE 4.	12 hours 36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
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~~.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- D.1 Place OPERABLE CBC subsystem in operation. OR D.2.1 Suspend movement of irradiated fuel assemblies in the secondary containment. AND D.2.2 Suspend CORE ALTERATIONS. ~~AND~~ ~~D.2.3 Initiate action to suspend OPDRVs.~~	Immediately Immediately Immediately ~~Immediately~~

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition B not met during movement of irradiated fuel assemblies in the secondary containment~~,~~ during CORE ALTERATIONS, ~~or during OPDRVs~~.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- E.1 Suspend movement of irradiated fuel assemblies in the secondary containment. AND E.2 Suspend CORE ALTERATIONS. ~~AND~~ ~~E.3 Initiate action to suspend OPDRVs.~~	Immediately Immediately ~~Immediately~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify each CBC subsystem has the capability to remove the available heat load.	In accordance with the Surveillance Frequency Control Program

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	----------NOTE---------- Enter applicable Condition and Required Actions of LCO 3.8.8, with one required division de-energized as a result of Condition A. ----------	
	A.1 Declare affected required feature(s), with no offsite power available, inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	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 (OPDRVs).~~	~~Immediately~~
	AND	
	A.2.~~4~~ 3 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One required DG inoperable.	B.1 Suspend CORE ALTERATIONS. AND B.2 Suspend movement of irradiated fuel assemblies in secondary containment ~~AND~~ ~~B.3 Initiate action to suspend OPDRVs.~~ AND B.~~4~~ 3 Initiate action to restore required DG to OPERABLE status.	Immediately Immediately ~~Immediately~~ Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.2.1	----------NOTES---------- 1. The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.9 through SR 3.8.1.13. 2. SR 3.8.1.13 is considered to be met without the ECCS initiation signals OPERABLE when the ECCS initiation signals are not required to be OPERABLE per Table 3.3.5.1-1. ---------- For AC sources required to be OPERABLE, the SRs of Specification 3.8.1, except SR 3.8.1.8, are applicable.	In accordance with applicable SRs

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	~~A.2.3~~ ~~Initiate action to suspend operations with a potential for draining the reactor vessel.~~ ~~AND~~ A.2.~~4~~ 3 Initiate action to restore required DC electrical power subsystems to OPERABLE status.	~~Immediately~~ Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	----------NOTE---------- The following SRs are not required to be performed: SR 3.8.4.7 and SR 3.8.4.8. ---------- For DC electrical power subsystems required to be OPERABLE the following SRs are applicable: SR 3.8.4.1 SR 3.8.4.4 SR 3.8.4.7 SR 3.8.4.2 SR 3.8.4.5 SR 3.8.4.8. SR 3.8.4.3 SR 3.8.4.6	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Distribution Systems — Shutdown

LCO 3.8.8 The necessary portions of the AC and DC electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE.

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 subsytems inoperable.	A.1 Declare associated supported required feature(s) inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	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	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.~~4~~ 3 Initiate actions to restore required AC and DC electrical power distribution subsytems to OPERABLE status.	Immediately
	AND	
	A.2.~~5~~ 4 Declare associated required shutdown cooling subsystem(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct breaker alignments and indicated power availability to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program

ATTACHMENT 3 TO NG-17-0093

Revised Technical Specifications Pages

81 Pages Follow

1.1 Definitions (continued)

CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific limits shall be determined for each reload cycle in accordance with Specification 5.6.5. Plant operation within these limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/ml), that alone would produce the same dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The dose conversion factors used for this calculation shall be those listed in Federal Guidance Report (FGR) 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," 1989 and FGR 12, "External Exposure to Radionuclides in Air, Water, and Soil," 1993.
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; (cont'd)

(continued)

1.1 Definitions (continued)

DRAIN TIME (cont'd)

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 is in continuous communication with the control room, is stationed at the controls, and is capable of closing the penetration flow path isolation device without offsite power.

c) The penetration flow paths required to be evaluated per paragraph b) are assumed to open instantaneously and are not subsequently isolated, and no water is assumed to be subsequently added to the RPV water inventory;

d) No additional draining events occur; and

e) Realistic cross-sectional areas and drain rates are used.

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

(continued)

1.1 Definitions (continued)

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 actuation of the breaker secondary (auxiliary) contact. 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.

(continued)

1.1 Definitions (continued)

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 not to interfere with the operation of leakage detection systems; b. Unidentified LEAKAGE All LEAKAGE into the drywell that is not identified LEAKAGE; c. Total LEAKAGE Sum of the identified and unidentified LEAKAGE.
LOGIC SYSTEM FUNCTIONAL TEST	A LOGIC SYSTEM FUNCTIONAL TEST shall be a test of all logic components required for OPERABILITY of a logic circuit, from as close to the sensor as practicable up to, but not including, the actuated device, to verify OPERABILITY. The LOGIC SYSTEM FUNCTIONAL TEST may be performed by means of any series of sequential, overlapping, or total system steps so that the entire logic system is tested.
MINIMUM CRITICAL POWER RATIO (MCPR)	The MCPR shall be the smallest critical power ratio (CPR) that exists in the core for each class of fuel. The CPR is that power in the assembly that is calculated by application of the appropriate correlation(s) to cause some point in the assembly to experience transition boiling, divided by the actual assembly operating power. Transition boiling means the boiling regime between nucleate and film boiling. Transition boiling is the regime in which both nucleate and

(continued)

1.1 Definitions (continued)

MINIMUM CRITICAL POWER RATIO (MCPR)	film boiling occur intermittently with neither type being completely stable.
MODE	A MODE shall correspond to any one inclusive combination of mode switch position, average reactor coolant temperature, and reactor vessel head closure bolt tensioning specified in Table 1.1-1 with fuel in the reactor vessel.
OPERABLE — OPERABILITY	A system, subsystem, division, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, division, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).
PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)	The PTLR is the unit specific document that provides the reactor vessel pressure and temperature limits, including heatup and cooldown rates, for the current reactor vessel fluence period. These pressure and temperature limits shall be determined for each fluence period in accordance with Specification 5.6.7.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 1912 MWt.
REACTOR PROTECTION SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until de-energization of the scram pilot valve solenoids. 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.

(continued)

1.1 Definitions (continued)

SHUTDOWN MARGIN (SDM)	SDM shall be the amount of reactivity by which the reactor is subcritical or would be subcritical throughout the operating cycle assuming that: a. The reactor is xenon free; b. The moderator temperature is ≥ 68°F (20°C), corresponding to the most reactive state; and c. All control rods are fully inserted except for the single control rod of highest reactivity worth, which is assumed to be fully withdrawn with the core in its most reactive state during the operating cycle. With control rods not capable of being fully inserted, the reactivity worth of these control rods must be accounted for in the determination of SDM.

(continued)

1.1 Definitions (continued)

THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.
TURBINE BYPASS SYSTEM RESPONSE TIME	The TURBINE BYPASS SYSTEM RESPONSE TIME consists of two components: a. The time from initial movement of the main turbine stop valve or control valve until 80% of the turbine bypass capacity is established; and b. The time from initial movement of the main turbine stop valve or control valve until initial movement of the turbine bypass valve. 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.

(continued)

Table 1.1-1 (page 1 of 1)
MODES

MODE	TITLE	REACTOR MODE SWITCH POSITION	AVERAGE REACTOR COOLANT TEMPERATURE (°F)
1	Power Operation	Run	NA
2	Startup	Refuel[(a)] or Startup/Hot Standby	NA
3	Hot Shutdown[(a)]	Shutdown	> 212
4	Cold Shutdown[(a)]	Shutdown	≤ 212
5	Refueling[(b)]	Shutdown or Refuel	NA

(a) All reactor vessel head closure bolts fully tensioned.

(b) One or more reactor vessel head closure bolts less than fully tensioned.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. As required by Required Action A.1 and referenced in Table 3.3.5.1-1	B.1 ----------NOTE---------- Only applicable for Functions 1.a, 1.b, 2.a, and 2.b. ---------- Declare supported feature(s) inoperable when redundant feature(s) ECCS initiation capability is inoperable.	1 hour from discovery of loss of initiation capability for feature(s) in two or more low pressure ECCS subsystems
	AND	
	B.2 ----------NOTE---------- Only applicable for Functions 3.a and 3.b. ---------- Declare High Pressure Coolant Injection (HPCI) System inoperable.	1 hour from discovery of loss of HPCI initiation capability
	AND	
	B.3 Place channel in trip.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	C.1 ----------NOTE---------- Only applicable for Functions 1.c, 1.e, 2.c and 2.e. ---------- Declare supported feature(s) inoperable.	1 hour from discovery of loss of initiation capability for two or more low pressure ECCS subsystems
	AND	
	C.2 ----------NOTE-------- Only applicable for Functions 2.g, 2.h, 2.i, and 2.j. ---------- Declare Low Pressure Coolant Injection (LPCI) subsystem inoperable.	1 hour from discovery of loss of Loop Selection capability
	AND	
	C.3 Restore channel to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	E.1 ----------NOTE---------- Only applicable for Functions 1.d and 2.f. ---------- Declare supported feature(s) inoperable.	1 hour from discovery of loss of initiation capability for two or more minimum flow valves in the low pressure ECCS subsystems
	AND	
	E.2 Restore channel to OPERABLE status.	7 days
F. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	F.1 Restore channel to OPERABLE status.	1 hour

(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	1,2,3,	4[(a)]	B	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 38.3 inches
b. Drywell Pressure - High	1,2,3	4[(a)]	B	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 2.19 psig
c. Reactor Steam Dome Pressure – Low (Injection Permissive)	1,2,3	4	C	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 363.3 psig and ≤ 485.1 psig
d. Core Spray Pump Discharge Flow – Low (Bypass)	1,2,3	1 per pump	E	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 256.6 gpm and ≤ 2382.1 gpm
e. Core Spray Pump Start Time Delay Relay	1,2,3	1 per pump	C	SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 2.6 seconds and ≤ 6.8 seconds
f. 4.16 kV Emergency Bus Sequential Loading Relay	1,2,3	1 per pump	F	SR 3.3.5.1.5 SR 3.3.5.1.6 SR 3.3.5.1.9	≤ 3500 V
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Vessel Water Level- Low Low Low	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 38.3 inches
b. Drywell Pressure - High	1,2,3	4	B	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 2.19 psig

(continued)

(a) 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. LPCI System (continued)					
c. Reactor Steam Dome Pressure – Low (Injection Permissive)	1,2,3	4	C	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 363.3 psig and ≤ 485.1 psig
d. Reactor Vessel Shroud Level - Low	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.9	≥ -40.89 inches
e. Low Pressure Coolant Injection Pump Start - Time Delay Relay	1,2,3	1 per pump	C	SR 3.3.5.1.8 SR 3.3.5.1.9	
Pumps A & B					≥ 8.8 seconds and ≤ 11.2 seconds
Pumps C & D					≥ 13.8 seconds and ≤ 33.5 seconds
f. Low Pressure Coolant Injection Pump Discharge Flow – Low (Bypass)	1,2,3	1 per loop	E	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 471.8 gpm and ≤ 3676.6 gpm
g. LPCI Loop Select-Reactor Vessel Water Level - Low-Low	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.6 SR 3.3.5.1.9	≥ 112.65 inches
h. LPCI Loop Select – Reactor Steam Dome Pressure - Low	1,2,3	4	C	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.9	≥ 887 psig

(continued)

Table 3.3.5.1-1 (page 3 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. LPCI System (continued)					
i. LPCI Loop Select – Recirculation Pump Differential Pressure	1,2,3	4 per pump	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.8 SR 3.3.5.1.9	$\leq$ 7.8 psid
j. LPCI Loop Select – Recirculation Riser Differential Pressure	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.9	$\geq$ 0.13 psid and $\leq$ 2.07 psid
k. 4.16 kV Emergency Bus Sequential Loading Relay	1,2,3	2	F	SR 3.3.5.1.5 SR 3.3.5.1.6 SR 3.3.5.1.9	$\leq$ 3500 V
3. High Pressure Coolant Injection (HPCI) System					
a. Reactor Vessel Water Level - Low Low	1, 2(b), 3(b)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.6 SR 3.3.5.1.9	$\geq$ 112.65 inches
b. Drywell Pressure - High	1, 2(b), 3(b)	4	B	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	$\leq$ 2.19 psig
c. Reactor Vessel Water Level - High	1, 2(b), 3(b)	2	C	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.6 SR 3.3.5.1.9	$\leq$ 214.8 inches
d. Condensate Storage Tank Level - Low	1, 2(b), 3(b)	2	D	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	$\geq$ 11.6 inches

(continued)

(b) With reactor steam dome pressure > 150 psig.

Table 3.3.5.1-1 (page 4 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
3. HPCI System (continued)					
e. Suppression Pool Water Level – High	1, 2[(b)], 3[(b)]	2	D	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 5.9 inches
f. High Pressure Coolant Injection Pump Discharge Flow – Low (Bypass)	1, 2[(b)], 3[(b)]	1	E	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 264.2 gpm and ≤ 2025.1 gpm
4. Automatic Depressurization System (ADS) Trip Logic A					
a. Reactor Vessel Water Level - Low Low Low	1, 2[(c)], 3[(c)]	2	G	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 38.3 inches
b. Automatic Depressurization System Timer	1, 2[(c)], 3[(c)]	1	H	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 125 seconds
c. Reactor Vessel Water Level – Low (Confirmatory)	1, 2[(c)], 3[(c)]	1	G	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 166.1 inches
d. Core Spray Pump Discharge Pressure - High	1, 2[(c)], 3[(c)]	2	H	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 114.2 psig and ≤ 177.0 psig
e. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, 2[(c)], 3[(c)]	4	H	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 103.8 psig and ≤ 147.0 psig

(continued)

(b) With reactor steam dome pressure > 150 psig.

(c) With reactor steam dome pressure > 100 psig.

Table 3.3.5.1-1 (page 5 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
5. ADS Trip Logic B					
a. Reactor Vessel Water Level - Low Low Low	1, 2(c), 3(c)	2	G	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 38.3 inches
b. Automatic Depressurization System Timer	1, 2(c), 3(c)	1	H	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≤ 125 seconds
c. Reactor Vessel Water Level – Low (Confirmatory)	1, 2(c), 3(c)	1	G	SR 3.3.5.1.1 SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 166.1 inches
d. Core Spray Pump Discharge Pressure - High	1, 2(c), 3(c)	2	H	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 114.2 psig and ≤ 177.0 psig
e. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, 2(c), 3(c)	4	H	SR 3.3.5.1.3 SR 3.3.5.1.8 SR 3.3.5.1.9	≥ 103.8 psig and ≤ 147.0 psig

(c) With reactor steam dome pressure > 100 psig.

3.3 INSTRUMENTATION

3.3.5.2 Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation

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

APPLICABILITY: According to Table 3.3.5.2-1

ACTIONS

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

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

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	D.1 Restore channel to OPERABLE status.	24 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Declare associated ECCS injections/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

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

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

Table 3.3.5.2-1 (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 Steam Dome Pressure – Low (Injection Permissive)	4, 5	4	C	SR 3.3.5.2.2	≤ 485.1 psig
b. Core Spray Pump Discharge Flow – Low (Bypass)	4, 5	1 per Pump[(a)]	D	SR 3.3.5.2.2	≥ 256.6 gpm and ≤ 2382.1 gpm
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Steam Dome Pressure – Low (Injection Permissive)	4, 5	4	C	SR 3.3.5.2.2	≤ 485.1 psig
b. Low Pressure Coolant Injection Pump Discharge Flow – Low (Bypass)	4, 5	1 per loop	D	SR 3.3.5.2.2	≥ 471.8 gpm and ≤ 3676.6 gpm
3. RHR System Isolation					
a. Reactor Vessel Water Level – Low	(b)	2 in one trip system	B	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 165.6 inches
4. Reactor Water Cleanup (RWCU) System Isolation					
a. Reactor Vessel Water Level – Low Low	(b)	2 in one trip system	B	SR 3.3.5.2.1 SR 3.3.5.2.2	≥ 112.65 inches

(a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.2, "Reactor Pressure Vessel Water Inventory Control."
(b) When automatic isolation of the associated penetration flow path(s) is credited in calculating DRAIN TIME.

3.3 INSTRUMENTATION

3.3.5.3 Reactor Core Isolation Cooling (RCIC) System Instrumentation

LCO 3.3.5.3 The RCIC System instrumentation for each Function in Table 3.3.5.3-1 shall be OPERABLE.

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

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 3.3.5.3-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	B.1 Declare RCIC System inoperable. AND B.2 Place channel in trip.	1 hour from discovery of loss of RCIC initiation capability 24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	C.1 Restore channel to OPERABLE status.	24 hours
D. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	D.1 ----------NOTE--------- Only applicable if RCIC pump suction is not aligned to the suppression pool. ---------- Declare RCIC System inoperable.	1 hour from discovery of loss of RCIC suction transfer capability
	AND	
	D.2.1 Place channel in trip.	24 hours
	OR	
	D.2.2 Align RCIC pump suction to the suppression pool.	24 hours
E. Required Action and associated Completion Time of Condition B, C, or D not met.	E.1 Declare RCIC System inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

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

1. Refer to Table 3.3.5.3-1 to determine which SRs apply for each RCIC Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 2 and 3; and (b) for up to 6 hours for Function 1 provided the associated Function maintains RCIC initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.3.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.5.3-1 (page 1 of 1)
Reactor Core Isolation Cooling System Instrumentation

FUNCTION	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level – Low Low	4	B	SR 3.3.5.3.1 SR 3.3.5.3.2 SR 3.3.5.3.3 SR 3.3.5.3.5	≥ 112.65 inches
2. Reactor Vessel Water Level - High	2	C	SR 3.3.5.3.1 SR 3.3.5.3.2 SR 3.3.5.3.3 SR 3.3.5.3.5	≤ 214.8 inches
3. Condensate Storage Tank Level - Low	2	D	SR 3.3.5.3.2 SR 3.3.5.3.4 SR 3.3.5.3.5	≥ 11.6 inches

3.3 INSTRUMENTATION

3.3.6.1 Primary Containment Isolation Instrumentation

LCO 3.3.6.1 The primary containment isolation instrumentation for each Function in Table 3.3.6.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6.1-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Place channel in trip.	12 hours for Functions 2.a, 2.b, 6.b, and 6.c AND 24 hours for Functions other than Functions 2.a, 2.b, and 6.b, and 6.c
	AND	
	A.2 ---------NOTE--------- Only applicable for Function 7.a. ---------- Inhibit containment spray system.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more automatic Functions with isolation capability not maintained.	B.1 Restore isolation capability.	1 hour
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Enter the Condition referenced in Table 3.3.6.1-1 for the channel.	Immediately
D. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	D.1 Isolate associated main steam line (MSL). OR D.2.1 Be in MODE 3. AND D.2.2 Be in MODE 4.	12 hours 12 hours 36 hours
E. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	E.1 Be in MODE 2.	8 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	F.1 Isolate the affected penetration flow path(s).	1 hour
G. [Deleted]		
H. As required by Required Action C.1 and referenced in Table 3.3.6.1-1. OR Required Action and associated Completion Time for Condition F not met.	H.1 Be in MODE 3. AND H.2 Be in MODE 4.	12 hours 36 hours
I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	I.1 Declare Standby Liquid Control (SLC) System inoperable. OR I.2 Isolate the Reactor Water Cleanup System.	1 hour 1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
J. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	J.1 Initiate action to restore channel to OPERABLE status. OR J.2 Initiate action to isolate the Residual Heat Removal (RHR) Shutdown Cooling System.	Immediately Immediately
K. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	K.1 ----------NOTE---------- Only applicable if inoperable channel is not in trip. ---------- Declare associated Suppression Pool Cooling/Spray subsystem(s) inoperable. OR K.2 ----------NOTE---------- Only applicable if inoperable channel is in trip. ---------- Declare Primary Containment inoperable.	 Immediately Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
L. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	L.1 Isolate the primary containment vent and purge penetration flow paths. OR	1 hour
	L.2 Establish administrative control of the primary containment vent and purge valves using continuous monitoring of alternate instrumentation.	1 hour

SURVEILLANCE REQUIREMENTS

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

1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Primary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Function 5.a; and (b) for up to 6 hours for Functions other than 5.a provided the associated Function maintains isolation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.2	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.3	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.4	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.5	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.6	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.7	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.8	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.9	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.6.1-1 (page 1 of 5)
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
1. Main Steam Line Isolation					
a. Reactor Vessel Water Level – Low Low Low	1,2,3	2	D	SR 3.3.6.1.1 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 38.3 inches
b. Main Steam Line Pressure - Low	1	2	E	SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.9	≥ 821 psig
c. Main Steam Line Flow - High	1,2,3	2 per MSL	D	SR 3.3.6.1.1 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.9	≤ 138% rated steam flow
d. Condenser Backpressure - High	1, 2[(a)], 3[(a)]	2	D	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 7.2 inches Hg vacuum
e. Main Steam Line Tunnel Temperature - High	1,2,3	4	D	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.7 SR 3.3.6.1.9	≤ 205.1°F
f.. Turbine Building Temperature - High	1,2,3	4	D	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.7 SR 3.3.6.1.9	≤ 205.1°F

(continued)

(a) When any turbine stop valve is greater than 90% open or when the key-locked bypass switch is in the NORM Position.

Table 3.3.6.1-1 (page 2 of 5)
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
2. Primary Containment Isolation					
a. Reactor Vessel Water Level – Low	1,2,3	2	H	SR 3.3.6.1.1 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 165.6 inches
b. Drywell Pressure - High	1,2,3	2	H	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 2.2 psig
c. Offgas Vent Stack - High Radiation	1[(c)], 2[(c)], 3[(c)]	1	L	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	(b)
d. Reactor Building Exhaust Shaft – High Radiation	1,2,3	1	H	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 12.8 mR/hr
e. Refueling Floor Exhaust Duct – High Radiation	1,2,3	1	H	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 10.6 mR/hr
3. High Pressure Coolant Injection (HPCI) System Isolation					
a. HPCI Steam Line Flow - High	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 409 inches (inboard) ≤ 110 inches (outboard)

(continued)

(b) Allowable value is determined in accordance with the ODAM.

(c) During venting or purging of primary containment.

Table 3.3.6.1-1 (page 3 of 5)
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
3. HPCI System Isolation (continued)					
b. HPCI Steam Supply Line Pressure – Low	1,2,3	2	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 50 psig and ≤ 147.1 psig
c. HPCI Turbine Exhaust Diaphragm Pressure - High	1,2,3	2	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 2.5 psig
d. Drywell Pressure - High	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 2.2 psig
e. Suppression Pool Area Ambient Temperature – High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 153.3°F
f. HPCI Leak Detection Time Delay	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	N/A
g. Suppression Pool Area Ventilation Differential Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 51.5°F
h. HPCI Equipment Room Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 178.3°F
i. HPCI Room Ventilation Differential Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 51.5°F

(continued)

Table 3.3.6.1-1 (page 4 of 5)
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
4. Reactor Core Isolation Cooling (RCIC) System Isolation					
a. RCIC Steam Line Flow – High	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 164 inches (inboard) ≤ 159 inches (outboard)
b. RCIC Steam Supply Line Pressure - Low	1,2,3	2	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 50.3 psig
c. RCIC Turbine Exhaust Diaphragm Pressure - High	1,2,3	2	F	SR 3.3.6.1.4 SR 3.3.6.1.6 SR 3.3.6.1.9	≥ 3.3 psig
d. Drywell Pressure – High	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 2.2 psig
e. RCIC Suppression Pool Area Ambient Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 153.3°F
f. RCIC Leak Detection Time Delay	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	N/A
g. RCIC Suppression Pool Area Ventilation Differential Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 51.5°F
h. RCIC Equipment Room Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 178.3°F
i. RCIC Room Ventilation Differential Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 51.5°F

(continued)

Table 3.3.6.1-1 (page 5 of 5)
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. Differential Flow - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 59 gpm
b. Area Temperature - High	1,2,3	1[(d)]	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 133.3°F
c. Area Ventilation Differential Temperature – High	1,2,3	1[(d)]	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	
RWCU Pump Room					≤ 22.5°F
RWCU Pump A Room					≤ 23.5°F
RWCU Pump B Room					≤ 34.5°F
RWCU Heat Exch. Room					≤ 51.5°F
d. SLC System Initiation	1,2	1[(e)]	I	SR 3.3.6.1.9	NA
e. Reactor Vessel Water Level – Low Low	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.4 SR 3.3.6.1.7 SR 3.3.6.1.9	≥ 112.65 inches
f. Area Near TIP Room Ambient Temperature – High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 115.7°F
6. Shutdown Cooling System Isolation					
a. Reactor Steam Dome Pressure - High	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.9	≤ 152.7 psig
b. Reactor Vessel Water Level – Low	3	2	J	SR 3.3.6.1.1 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 165.6 inches
c. Drywell Pressure – High	1,2,3	2	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 2.2 psig
7. Containment Cooling System Isolation					
a. Containment Pressure – High	1,2,3	4	K	SR 3.3.6.1.3 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 1.25 psig

(d) Each Trip System must have either an OPERABLE Function 5.b or an OPERABLE Function 5.c channel in both the RWCU pump area and in the RWCU heat exchanger area.

(e) SLC System Initiation only inputs into one of the two trip systems.

3.3 INSTRUMENTATION

3.3.6.2 Secondary Containment Isolation Instrumentation

LCO 3.3.6.2 The secondary containment isolation instrumentation for each Function in Table 3.3.6.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6.2-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Place channel in trip.	12 hours for Functions 1 and 2 AND 24 hours for Functions 3 and 4
B. One or more Functions with secondary containment isolation capability not maintained.	B.1 Restore secondary containment isolation capability.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met.	C.1.1 Isolate secondary containment. OR	1 hour
	C.1.2 Declare associated Secondary Containment Isolation Valves/Dampers (SCIV/Ds) inoperable. AND	1 hour
	C.2.1 Place the associated Standby Gas Treatment (SBGT) subsystem(s) in operation. OR	1 hour
	C.2.2 Declare associated SBGT subsystem(s) inoperable.	1 hour

SURVEILLANCE REQUIREMENTS

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

1. Refer to Table 3.3.6.2-1 to determine which SRs apply for each Secondary Containment Isolation Function.

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

SURVEILLANCE		FREQUENCY
SR 3.3.6.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.2	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.3	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

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	1,2,3	2	SR 3.3.6.2.1 SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	$\geq$ 165.6 inches
2. Drywell Pressure - High	1,2,3	2	SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	$\leq$ 2.2 psig
3. Reactor Building Exhaust Shaft – High Radiation	1,2,3	1	SR 3.3.6.2.2 SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	$\leq$ 12.8 mR/hr
4. Refueling Floor Exhaust Duct – High Radiation	1,2,3	1	SR 3.3.6.2.2 SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	$\leq$ 10.6 mR/hr

3.3 INSTRUMENTATION

3.3.6.3 Low-Low Set (LLS) Instrumentation

LCO 3.3.6.3 The LLS valve instrumentation for each Function in Table 3.3.6.3-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One LLS valve inoperable due to inoperable channel(s).	A.1 Restore channel(s) to OPERABLE status.	24 hours
B. One or more Safety Relief Valves (SRVs) with one Function 3 channel inoperable.	B.1 Restore channel(s) to OPERABLE status.	Prior to entering MODE 2 or 3 from MODE 4
C. ----------NOTE---------- Separate Condition entry is allowed for each SRV. ---------- One or more SRVs with two or more Function 3 channels inoperable.	C.1 Restore at least two channels per SRV to OPERABLE status.	14 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A, B, or C not met. OR Both LLS valves inoperable due to inoperable channels.	D.1 Declare the associated LLS valve(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

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

1. Refer to Table 3.3.6.3-1 to determine which SRs apply for each Function.

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

SURVEILLANCE		FREQUENCY
SR 3.3.6.3.1	Perform CHANNEL FUNCTIONAL TEST for portion of the channel outside primary containment.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.3.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.3.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.3.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.3.5	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.3.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.6.3-1 (page 1 of 1)
Low-Low Set Instrumentation

FUNCTION	REQUIRED CHANNELS PER FUNCTION	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Steam Dome Pressure - High	1 per LLS valve	SR 3.3.6.3.2 SR 3.3.6.3.3 SR 3.3.6.3.6	≤ 1069.21 psig
2. Low-Low Set Pressure Setpoints	2 per LLS valve	SR 3.3.6.3.2 SR 3.3.6.3.4 SR 3.3.6.3.6	Low: Open ≥ 1014 psig and ≤ 1045 psig Close ≥ 893.4 psig and ≤ 925 psig High: Open ≥ 1019 psig and ≤ 1050 psig Close ≥ 893.4 psig and ≤ 930 psig
3. Tailpipe High Pressure	3 per SRV	SR 3.3.6.3.1 SR 3.3.6.3.5 SR 3.3.6.3.6	≤ 99 psig

3.3 INSTRUMENTATION

3.3.7.1 Standby Filter Unit (SFU) System Instrumentation

LCO 3.3.7.1 Two channels of the Control Building Intake Area 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.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or both channels inoperable.	A.1 Declare associated SFU subsystem(s) inoperable. OR A.2 Place associated SFU subsystem(s) in the isolation mode.	1 hour 1 hour

SURVEILLANCE REQUIREMENTS

----------NOTE----------
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the other channel is OPERABLE.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.1.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be $\leq$ 5 mR/hr.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.8.1 Loss of Power (LOP) Instrumentation

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

APPLICABILITY: MODES 1, 2, and 3,
When the associated Diesel Generator is required to be OPERABLE by LCO 3.8.2, "AC Sources – Shutdown."

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Function 1 or 3 channels inoperable.	A.1 Place channel in trip.	1 hour
B. One or more Function 2 channels inoperable.	B.1 Declare associated Diesel Generator (DG) inoperable. AND B.2 Place channel in trip.	1 hour from discovery of loss of initiation capability for feature(s) in one or both divisions 24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time not met.	C.1 Declare associated DG inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

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

1. Refer to Table 3.3.8.1-1 to determine which SRs apply for each LOP Function.

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

SURVEILLANCE		FREQUENCY
SR 3.3.8.1.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.1.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.1.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.8.1-1 (page 1 of 1)
Loss of Power Instrumentation

FUNCTION	REQUIRED CHANNELS PER BUS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)			
a. Bus Undervoltage	1	SR 3.3.8.1.2 SR 3.3.8.1.4 SR 3.3.8.1.5	$\geq$ 595 V and $\leq$ 2275 V
2. 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)			
a. Bus Undervoltage	4	SR 3.3.8.1.1 SR 3.3.8.1.3 SR 3.3.8.1.5	$\geq$ 3780 V and $\leq$3822 V
b. Time Delay	4	SR 3.3.8.1.1 SR 3.3.8.1.3 SR 3.3.8.1.5	$\geq$ 7.92 seconds and $\leq$ 8.5 seconds
3. 4.16 kV Emergency Transformer Supply Undervoltage	2	SR 3.3.8.1.2 SR 3.3.8.1.3 SR 3.3.8.1.5	$\geq$ 2450 V

3.3 INSTRUMENTATION

3.3.8.2 Reactor Protection System (RPS) Electric Power Monitoring

LCO 3.3.8.2 Two RPS Electrical Protection Assemblies (EPAs) shall be OPERABLE for each inservice RPS motor generator set or alternate power supply.

APPLICABILITY: MODES 1 and 2,
MODES 3, 4 and 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or both inservice power supplies with one EPA inoperable.	A.1 Remove associated inservice power supply(s) from service.	72 hours
B. One or both inservice power supplies with both EPAs inoperable.	B.1 Remove associated inservice power supply(s) from service.	1 hour
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1 or 2.	C.1 Be in MODE 3.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A or B not met in MODE 3, 4 or 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies.	D.1 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.8.2.1	----------NOTE---------- Only required to be performed prior to entering MODE 2 or 3 from MODE 4, when in MODE 4 for ≥ 24 hours. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.2.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ 132 V. b. Undervoltage ≥ 108 V. c. Underfrequency ≥ 57 Hz.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.2.3	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program

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

3.5.1 ECCS — Operating

LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of four 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 Residual Heat Removal (RHR) pump inoperable.	A.1 Restore RHR pump to OPERABLE status.	30 Days
B. One low pressure ECCS subsystem inoperable for reasons other than Condition A.	B.1 Restore low pressure ECCS subsystem to OPERABLE status.	7 days
C. One Core Spray subsystem inoperable. AND One or two RHR pump(s) inoperable.	C.1 Restore Core Spray subsystem to OPERABLE status. OR C.2 Restore RHR pump(s) to OPERABLE status.	72 hours 72 hours
D. Both Core Spray subsystems inoperable.	D.1 Restore one Core Spray subsystem to OPERABLE status.	72 hours

(continued)

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

3.5.2 Reactor Pressure Vessel (RPV) Water Inventory Control

LCO 3.5.2 DRAIN TIME of RPV water inventory to the top of active fuel (TAF) shall be $\geq$ 36 hours.

AND

One low pressure ECCS subsystems shall be OPERABLE.

APPLICABILITY: MODES 4 and 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required ECCS subsystem inoperable.	A.1 Restore required ECCS 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

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. DRAIN TIME < 36 hours and ≥ 8 hours.	C.1 Verify secondary containment boundary is capable of being established in less than the DRAIN TIME. AND	4 hours
	C.2 Verify each secondary containment penetration flow path is capable of being isolated in less than the DRAIN TIME. AND	4 hours
	C.3 Verify one standby gas treatment subsystem is capable of being placed in operation in less that the DRAIN TIME.	4 hours

(continued)

ACTIONS (Continued)

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

(continued)

ACTIONS (Continued)

E.	Required Action and associated Completion Time of Condition C or D not met. OR DRAIN TIME < 1 hour.	E.1	Initiate action to restore DRAIN TIME to ≥ 36 hours.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify DRAIN TIME ≥ 36 hours.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.2	Verify, for a required Low Pressure Coolant Injection (LPCI) subsystem, the suppression pool water level is ≥ 7.0 ft.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.3	Verify, for a required Core Spray (CS) subsystem, the: a. Suppression pool water level is ≥ 8.0 ft; or b. Condensate storage tank water level in one CST is ≥ 11 ft or ≥ 7 ft in both CSTs.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify, for the required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.5	----------NOTE---------- A LPCI subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable. --- ----------NOTE---------- Not required to be met for system vent flow paths opened under administrative control. --- Verify for the required ECCS subsystem, each power operated and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.6	Operate the required ECCS injection/spray subsystem through the recirculation line for $\geq$ 10 minutes.	In accordance with the Inservice Testing Program
SR 3.5.2.7	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS), RPV WATER INVENTORY CONTROL, 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. AND A.2 Restore RCIC System to OPERABLE status.	Immediately 14 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Reduce reactor steam dome pressure to ≤ 150 psig.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.3.1	Verify the RCIC System locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.2	----------NOTE---------- Not required to be met for system vent flow paths opened under administrative control. ----------	
	Verify each RCIC System power operated and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.3	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ----------	
	Verify, with reactor pressure $\leq$ 1025 psig and $\geq$ 940 psig, the RCIC pump can develop a flow rate $\geq$ 400 gpm against a system head corresponding to reactor pressure.	In accordance with the Inservice Testing Program
SR 3.5.3.4	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ----------	
	Verify, with reactor pressure $\leq$ 160 psig, the RCIC pump can develop a flow rate $\geq$ 400 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.5.3.5	----------NOTE---------- Vessel injection may be excluded. ----------	
	Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program

3.6 CONTAINMENT SYSTEMS

3.6.1.3 Primary Containment Isolation Valves (PCIVs)

LCO 3.6.1.3 Each PCIV, except reactor building-to-suppression chamber vacuum breakers, shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

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

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. (continued)	E.3 ----------NOTES---------- 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------- Verify the affected penetration flow path is isolated.	Once per 31 days for isolation device outside containment
F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 4.	12 hours 36 hours

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.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Secondary containment inoperable.	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. AND B.2 Be in MODE 4.	12 hours 36 hours

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.4.2 Secondary Containment Isolation Valves/Dampers (SCIV/Ds)

LCO 3.6.4.2 Each SCIV/D shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

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 SCIV/Ds.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2 ----------NOTES---------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------- Verify the affected penetration flow path is isolated.	 Once per 31 days
B. ----------NOTE---------- Only applicable to penetration flow paths with two isolation valves/dampers. ---------- One or more penetration flow paths with two SCIV/Ds inoperable.	B.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve/damper, closed manual valve, or blind flange.	4 hours

(continued)

ACTIONS (continued)

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. AND C.2 Be in MODE 4.	12 hours 36 hours

3.6 CONTAINMENT SYSTEMS

3.6.4.3 Standby Gas Treatment (SBGT) System

LCO 3.6.4.3 Two SBGT subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SBGT subsystem inoperable.	A.1 Restore SBGT subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two SBGT subsystems inoperable.	C.1 Enter LCO 3.0.3.	Immediately

3.7 PLANT SYSTEMS

3.7.4 Standby Filter Unit (SFU) System

LCO 3.7.4 Two SFU subsystems shall be OPERABLE.

---NOTE---
The control building envelope (CBE) 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.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SFU subsystem inoperable for reasons other than Condition B.	A.1 Restore SFU subsystem to OPERABLE status.	7 days
B. One or more SFU subsystems inoperable due to inoperable CBE boundary in MODES 1, 2, and 3.	B.1 Initiate actions to implement mitigating actions. AND B.2 Verify mitigating actions ensure CBE occupant exposures to radiological hazards will not exceed limits and verify by administrative means that CBE occupants are protected from smoke and chemical hazards. AND B.3 Restore CBE boundary to OPERABLE status.	Immediately 24 hours 90 days

(continued)

ACTIONS (continued)

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. AND C.2 Be in MODE 4.	12 hours 36 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.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- D.1 Place OPERABLE SFU subsystem in the isolation mode. OR D.2.1 Suspend movement of irradiated fuel assemblies in the secondary containment. AND D.2.2 Suspend CORE ALTERATIONS.	 Immediately Immediately Immediately
E. Both SFU subsystems inoperable in MODE 1, 2 or 3 for reasons other than Condition B.	E.1 Enter LCO 3.0.3	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Both SFU subsystems inoperable during movement of irradiated fuel assembles in the secondary containment during CORE ALTERATIONS. OR One or more SFU subsystems inoperable due to an inoperable CBE boundary during movement of irradiated fuel assemblies in the secondary containment during CORE ALTERATIONS.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- F.1 Suspend movement of irradiated fuel assemblies in the secondary containment. AND F.2 Suspend CORE ALTERATIONS.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Operate each SFU subsystem for ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.7.4.2	Perform required SFU filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP

(continued)

3.7 PLANT SYSTEMS

3.7.5 Control Building Chiller (CBC) System

LCO 3.7.5 Two CBC subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of irradiated fuel assemblies in the secondary containment,
During CORE ALTERATIONS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CBC subsystem inoperable.	A.1 Restore CBC subsystem to OPERABLE status.	30 days
B. Two CBC subsystems inoperable.	B.1 Verify control building area temperatures < 90°F. AND B.2 Restore one CBC subsystem to OPERABLE status.	Once per 4 hours 72 hours
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. AND C.2 Be in MODE 4.	12 hours 36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
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.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- D.1 Place OPERABLE CBC subsystem in operation. OR D.2.1 Suspend movement of irradiated fuel assemblies in the secondary containment. AND D.2.2 Suspend CORE ALTERATIONS.	Immediately Immediately Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition B not met during movement of irradiated fuel assemblies in the secondary containment during CORE ALTERATIONS.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- E.1 Suspend movement of irradiated fuel assemblies in the secondary containment. AND E.2 Suspend CORE ALTERATIONS.	 Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify each CBC subsystem has the capability to remove the available heat load.	In accordance with the Surveillance Frequency Control Program

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	----------NOTE---------- Enter applicable Condition and Required Actions of LCO 3.8.8, with one required division de-energized as a result of Condition A. --- A.1 Declare affected required feature(s), with no offsite power available, inoperable. OR A.2.1 Suspend CORE ALTERATIONS. AND A.2.2 Suspend movement of irradiated fuel assemblies in the secondary containment. AND A.2.3 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately Immediately Immediately Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One required DG inoperable.	B.1 Suspend CORE ALTERATIONS. AND B.2 Suspend movement of irradiated fuel assemblies in secondary containment AND B.3 Initiate action to restore required DG to OPERABLE status.	Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.2.1	----------NOTES---------- 1. The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.9 through SR 3.8.1.13. 2. SR 3.8.1.13 is considered to be met without the ECCS initiation signals OPERABLE when the ECCS initiation signals are not required to be OPERABLE per Table 3.3.5.1-1. --- For AC sources required to be OPERABLE, the SRs of Specification 3.8.1, except SR 3.8.1.8, are applicable.	In accordance with applicable SRs

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.3 Initiate action to restore required DC electrical power susbsystems to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	----------NOTE---------- The following SRs are not required to be performed: SR 3.8.4.7 and SR 3.8.4.8. ----------	
	For DC electrical power subsystems required to be OPERABLE the following SRs are applicable: SR 3.8.4.1 SR 3.8.4.4 SR 3.8.4.7 SR 3.8.4.2 SR 3.8.4.5 SR 3.8.4.8. SR 3.8.4.3 SR 3.8.4.6	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Distribution Systems — Shutdown

LCO 3.8.8 The necessary portions of the AC and DC electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE.

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 subsytems inoperable.	A.1 Declare associated supported required feature(s) inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2.2 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	AND	
	A.2.3 Initiate action to restore required AC and DC electrical power distribution subsystems to OPERABLE status.	Immediately
	AND	(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Declare associated required shutdown cooling subsystem(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct breaker alignments and indicated power availability to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program

ATTACHMENT 4 TO NG-17-0093

Proposed Technical Specification Bases Changes (Mark-Up)

80 Pages Follow

BASES (continued)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The actions of the ECCS are explicitly assumed in the safety analyses of References 1, 2 and 3. The ECCS is initiated to preserve the integrity of the fuel cladding by limiting the post LOCA peak cladding temperature to less than the 10 CFR 50.46 limits.

ECCS instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). Certain instrumentation Functions are retained for other reasons and are described below in the individual Functions discussion.

The OPERABILITY of the ECCS instrumentation is dependent upon the OPERABILITY of the individual instrumentation channel Functions specified in Table 3.3.5.1-1. Each Function must have a required number of OPERABLE channels, 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.

a footnote which

Allowable Values are specified for each ECCS Function specified in the Table. Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Value between CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal 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 waterlevel), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., on-off sensor or bi-stable trip circuit) changes state. Analytical Limits, where established, are the limiting values of the process parameters used in safety analysis to define the margin to unacceptable consequences. Margin is provided between the Allowable Value and the Analytical Limits to allow for process, calibration (i.e., M&TE) and some instrument uncertainties. Additional margin

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

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

Reactor Vessel Water Level — Low Low Low signals are initiated from four level switches that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. The Reactor Vessel Water Level — Low Low Low Allowable Value is chosen to allow time for the low pressure core flooding LCO, and systems to activate and provide adequate cooling.

Four channels of Reactor Vessel Water Level — Low Low Low Function are only required to be OPERABLE when the ECCS are 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, the Reactor Vessel Water Level Low, Low, Low, Level 1 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 in order to minimize the possibility of fuel damage. The Drywell Pressure — High Function, along with the Reactor Water Level — Low Low Low Function, is directly assumed in the analysis of the recirculation line break (Ref. 2). The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

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

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.c, 2.c. Reactor Steam Dome Pressure — Low (Injection Permissive) (continued)

Four channels of Reactor Steam Dome 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. Refer to LCO 3.5.1 ~~and LCO 3.5.2~~ for Applicability Bases for the low pressure ECCS subsystems.

1.d, 2.f. 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(s) from overheating when the pump is operating and the associated injection valve is not fully open. The minimum flow line valves (normally open for the CS System and normally closed for the LPCI System) receive an open signal when low flow is sensed, and automatically close when the flow rate is adequate to protect the associated pump. The LPCI and 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 flow rates 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 flow switch per CS pump and one differential pressure switch for the two RHR pumps in each division are used to detect the associated subsystems' flow rates. The logic is arranged such that each differential pressure switch or flow switch causes its associated minimum flow valve to receive an open signal. 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 by design to limit reactor vessel inventory loss during the startup of the RHR shutdown cooling mode although, typically, the minimum flow valves are prevented from opening when operating in the 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

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

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

that the closure of the minimum flow valve is initiated to allow the assumed flow into the core. Each channel of Pump Discharge Flow — Low Function (two CS channels, one per pump and two LPCI channels, one per loop) 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.* Refer to LCO 3.5.1 ~~and LCO 3.5.2~~ for Applicability Bases for the low pressure ECCS subsystems.

~~* Per footnote (e) to Function 1d in Table 3.3.5.1-1, the CS minimum flow path instrumentation is not required to be OPERABLE in MODES 4 and 5 during RFO 23.~~

2.d. Reactor Vessel Shroud Level — Low

The Reactor Vessel Shroud Level-Low Function is provided as a permissive to allow the RHR System to be manually aligned from the LPCI mode to the suppression pool cooling/spray or drywell spray modes with a LPCI initiation signal still present. This function ensures: 1) that the permissive is removed prior to reaching two thirds core height when vessel level is decreasing, and 2) that the permissive is not restored until two thirds core height is reached when vessel level is increasing. This ensures that LPCI is available to prevent or minimize fuel damage. This function may be overridden during accident conditions as allowed by plant procedures to allow containment cooling/spray regardless of the level present in the shroud.

Reactor Vessel Shroud Level — Low signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. The Reactor Vessel Shroud Level — Low Allowable Value is chosen to allow the low pressure core flooding systems to activate and provide adequate cooling before allowing a manual transfer.

Four channels of the Reactor Vessel Shroud Level — Low 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 that this Function isolates (since the containment cooling mode of RHR is not required to be OPERABLE in MODES 4 and 5 and is normally not used).

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.e, 2.e Core Spray Pump Startup - Time Delay Relay and Low Pressure Coolant Injection Pump Start - Time Delay Relay

The purpose of these time delay relays is to stagger the start of the CS pumps and LPCI pumps that are in each of Divisions 1 and 2, thus limiting the starting transients on the 4.16 kV emergency buses. This Function is only necessary when power is being supplied from the standby power sources (DG). However, since the time delay does not degrade ECCS operation, it remains in the pump start logic at all times. The CS Pump and 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 standby power sources.

There are two CS Pump Start - Time Delay Relays and four LPCI Pump Start - Time Delay Relays, one in each of the CS and RHR pump start logic circuits. While each time delay relay is dedicated to a single pump start logic, a single failure of a CS Pump Start - Time Delay Relay or of a LPCI Pump Start - Time Delay Relay could result in the failure of the three low pressure ECCS pumps, powered from the same emergency bus if the emergency bus is being powered by its associated DG, to perform their intended function within the assumed time (e.g., as in the case where two or more ECCS pumps on one emergency bus start simultaneously due to an inoperable time delay relay which, in turn cause the associated DG output breaker to trip open due to undervoltage conditions). This still leaves three of the six low pressure ECCS pumps OPERABLE; thus, the single failure criterion is met (i.e., loss of one instrument does not preclude ECCS initiation). The Allowable Value for the CS Pump Start-Time Delay Relay and each LPCI Pump Start — Time Delay Relay is chosen to be long enough so that most of the starting transient of one pump is complete before starting another pump on the same 4.16 kV emergency bus and short enough so that ECCS operation is not degraded.

Each CS Pump Start - Time Delay Relay and each LPCI Pump Start - Time Delay Relay Function is required to be OPERABLE only when the associated CS or LPCI System is required to be OPERABLE. Refer to LCO 3.5.1 ~~and LCO 3.5.2~~ for Applicability Bases for the CS and LPCI Systems.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

1.f 2.k 4.16 kV Emergency Bus Sequential Loading Relay

An undervoltage condition on an emergency bus indicates that sufficient power (from either the offsite or onsite sources) is not available to allow starting of the low pressure ECCS pumps. Therefore, if this condition exists, the start permissive signal is withheld from the circuits that start both the Core Spray (CS) and Low Pressure Coolant Injection (LPCI) pumps during accident conditions, and the CS and LPCI pumps powered from the respective emergency bus are prevented from starting. This ensures that the low pressure ECCS pumps are not started during accident conditions unless adequate power is available.

Each emergency bus is monitored by a single relay, which inputs into a one-out-of-two once logic for each division. Each logic channel supports one CS and two LPCI pumps. An instrument channel consists of the common bus monitoring relay and the associated relay contacts for each ECCS pump.

The 4.16 kV Emergency Bus Sequential Loading Relay Allowable Values are low enough to prevent low pressure ECCS pump starting unless adequate power is available, but high enough so that low pressure ECCS pump starting is not unnecessarily prohibited or delayed and is within the maximum adjustable range of the relay.

To ensure that no single failure can prevent successful operation of the combined low pressure ECCS, two channels of the 4.16 kV Emergency Bus Sequential Loading Relay Function are required to be OPERABLE whenever the LPCI System is required to be OPERABLE (i.e., MODES 1, 2, and 3), ~~and one channel is required to be OPERABLE whenever the associated LPCI pump(s) is required to be OPERABLE by LCO 3.5.2, "ECCS - Shutdown." One channel of 4.16 kV Emergency Bus Sequential Loading Relay Function is required to be OPERABLE whenever the associated CS subsystem (i.e., pump) is required to be OPERABLE. To ensure this Function is available when required, the 4.16 kV Emergency Bus Sequential Loading Relay is required to be OPERABLE in MODES 1, 2, and 3, and when the associated low pressure ECCS is required to be OPERABLE by LCO 3.5.2, "ECCS - Shutdown."~~ Refer to LCO 3.5.1 ~~and LCO 3.5.2~~ for Applicability Bases for the CS and LPCI Systems.

(continued)

BASES

ACTIONS

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

For Required Action B.2, automatic initiation capability is lost if certain combinations of Function 3.a or Function 3.b channels are inoperable and untripped. In this situation (loss of automatic initiation capability), the 24 hour allowance of Required Action B.3 is not appropriate and the feature(s) associated with the inoperable, untripped channels 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 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.~~

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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.d, 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.d capability for 24 hours is allowed, since the LPCI System remains capable of performing its 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 allowable out of service time "clock." For Required Action B.1, the Completion Time only begins upon discovery that a redundant feature in two or more low pressure ECCS subsystems (i.e., both CS subsystems or either CS subsystem in combination with the LPCI subsystem) cannot automatically initiate their supported features due to inoperable, untripped channels within the same Function as described in the paragraph above.

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BASES

ACTIONS

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

(d) two or more Function 2.i channels for the same recirculation pump are inoperable in both trip systems, (e) two Function 2.j channels are inoperable in both trip systems, or (f) two or more Function 1.e or 2.e channels are inoperable in different divisions. In these situations (loss of redundant automatic initiation capability), the 24 hour allowance of Required Action C.3 is not appropriate and the feature(s) associated with the inoperable channels must be declared inoperable within 1 hour. Since each inoperable channel would have Required Action C.1 or C.2, as appropriate, applied separately (refer to ACTIONS Note), each inoperable channel would only require the affected portion of the associated system to be declared inoperable. However, since channels for either both divisions of LPCI loop select logic or for two or more low pressure ECCS subsystems are inoperable (e.g., both CS subsystems or either CS subsystem in combination with the LPCI subsystem), and the Completion Times started concurrently for the channels in both subsystems, this results in the affected portions in both subsystems being concurrently declared inoperable. For Functions 1.c, 1.e, and 2.e, the affected portions are the associated low pressure ECCS pumps. For Functions 2.g, 2.h, 2.i, and 2.j, the affected portion is the LPCI subsystem. ~~As noted (Note 1), Required Actions C.1 and C.2 are 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.3) is allowed during MODES 4 and 5.~~

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The → Note ~~2~~ to Required Action C.1 states that Required Action C.1 is only applicable for Functions 1.c, 2.c, 1.e, and 2.e. Note ~~2~~ to Required Action C.2 states that Required Action C.2 is only applicable for Functions 2.g, 2.h, 2.i, and 2.j. Required Actions C.1 and C.2 are 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.3.

(continued)

BASES

ACTIONS (continued)

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.f (e.g., low pressure ECCS). Redundant automatic initiation capability is lost if either the automatic opening or closing function for two or more low pressure ECCS minimum flow valves is inoperable. Since each of the four minimum flow valves is initiated by a corresponding instrument channel, redundant automatic initiation capability is lost if any two of the four Function 1.d and 2.f 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(s) to be declared inoperable. However, since channels for two or more minimum flow valves in the low pressure ECCS subsystems are inoperable, and the Completion Times started concurrently for the channels of the low pressure ECCS minimum flow valves, this results in the affected low pressure ECCS pump(s) 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 system or 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 pressure ECCS Functions. Required Action E.1 is not applicable to HPCI Function 3.f since the loss of one channel results in a loss of the Function (one-out-of-one logic). This loss was considered during the development of Reference 5 and considered acceptable for the 7 days allowed by Required Action E.2.

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(continued)

BASES

ACTIONS (continued)

F.1

With a Function 1.f (2.k) channel inoperable, the 4.16 kV Emergency Bus Sequential Loading Relay is not cable of providing a start permissive signal for the low pressure ECCS pumps in the affected division, and the associated low pressure ECCS are not capable of performing their intended functions. Placing a channel in the tripped condition makes the associated ECCS pump(s) inoperable, since the pump(s) is prevented from automatically starting. In fact, tripping the bus power monitor relay will cause the associated DG to start, as it is common to the bus undervoltage logic. Consequently, one hour is provided to restore OPERABILITY of the channel. Otherwise, the affected low pressure ECCS ~~(e.g., the CS subsystem in the affected division, the LPCI System if either division is affected in Modes 1, 2 or 3, and the LPCI pump(s) in the affected division for Modes 4 and 5)~~ are declared inoperable immediately. This requires entry into LCO 3.5.1 ~~or LCO 3.5.2~~, which provide appropriate actions for inoperable low pressure ECCS Systems and subsystems.

subsystems

s

G.1 and G.2

Required Action G.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within similar ADS trip logic A and B Functions result in redundant automatic initiation capability being lost for the ADS. Redundant automatic initiation capability is lost if either (a) one Function 4.a channel and one Function 5.a channel are inoperable and untripped, or (b) one Function 4.c channel and one Function 5.c channel are inoperable and untripped.

In this situation (loss of automatic initiation capability), the 96 hour or 8 day allowance, as applicable, of Required Action G.2 is not appropriate and all ADS valves must be declared inoperable within 1 hour after discovery of loss of ADS initiation capability.

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 allowable out of service time "clock."

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B 3.3 INSTRUMENTATION

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

BASES

BACKGROUND

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

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

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

BASES

BACKGROUND (continued)

The purpose of the RPV Water Inventory Control Instrumentation is to support the requirements of LCO 3.5.2, "Reactor Pressure Vessel (RPV) Water Inventory Control," and the definition of DRAIN TIME. There are functions that are required for manual initiation or operation of the ECCS injection/spray subsystem required to be OPERABLE by LCO 3.5.2 and other functions that support automatic isolation of Residual Heat Removal subsystem and Reactor Water Cleanup system penetration flow path(s) on low RPV water level.

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

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

With the unit in MODE 4 or 5, RPV water inventory control is not required to mitigate any events or accidents evaluated in the safety 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, 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.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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

Core Spray and Low Pressure Coolant Injection Systems

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

Low reactor steam dome 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 steam dome pressure will be below the ECCS maximum design pressure, the Reactor Steam Dome Pressure - Low signals are assumed to be OPERABLE and capable of permitting initiation of the ECCS.

The Reactor Steam Dome Pressure - Low signals are initiated from four pressure switches that sense the reactor dome pressure. The pressure switches are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic.

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

The four channels of Reactor Steam Dome Pressure - Low Function are required to be OPERABLE in MODES 4 and 5.

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 flow transmitter for each Core Spray subsystem and each LPCI subsystem 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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

provided to limit reactor vessel inventory loss during the startup of the Residual Heat Removal (RHR) shutdown cooling mode.

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

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

RHR System Isolation

3.a - Reactor Vessel Water Level - Low

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 Function associated with RHR System isolation may be credited for automatic isolation of penetration flow paths associated with the RHR System.

Reactor Vessel Water Level - Low signals are initiated from four level indicating switches 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 Function are available, only two channels (all in the same trip system) are required to be OPERABLE.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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

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

This Function isolates the Group 4 valves.

Reactor Water Cleanup (RWCU) System Isolation

4.a - Reactor Vessel Water level - Low Low
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 Low 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 Low signals are initiated from four level indicating switches 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 Function are available, only two channels (all in the same trip system) are required to be OPERABLE.

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

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

This Function isolates the Group 5 valves.

BASES

ACTIONS

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

A.1

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

B.1 and B.2

RHR System Isolation, Reactor Vessel Water Level - Low and Reactor Water Cleanup System, Reactor Vessel Water Level - Low Low 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

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.

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.

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.

BASES

SURVEILLANCE REQUIREMENTS

As noted in the beginning of the SRs, the SRs for each RPV Water Inventory Control instrument Function are found in the SRs column of Table 3.3.5.2-1.

SR 3.3.5.2.1

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

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

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.2.2

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

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

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

~~SR 3.3.5.2.3~~

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.

B 3.3 INSTRUMENTATION

B 3.3.5.2 Reactor Core Isolation Cooling (RCIC) System Instrumentation 3

BASES

BACKGROUND

The purpose of the RCIC System instrumentation is to initiate actions to ensure adequate core cooling when the reactor vessel is isolated from its primary heat sink (the main condenser) and normal coolant makeup flow from the Reactor Feedwater System is unavailable, such that initiation of the low pressure Emergency Core Cooling Systems (ECCS) pumps does not occur. A more complete discussion of RCIC System operation is provided in the Bases of LCO 3.5.3, "RCIC System."

The RCIC System may be initiated by either automatic or manual means, although manual initiation requires manipulation of individual component control switches. Automatic initiation occurs for conditions of reactor vessel low low water level. The variable is monitored by four level switches that are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic arrangement. Once initiated, the RCIC logic seals in and can be reset by the operator only when the reactor vessel water level signals have cleared.

The RCIC test return valve is closed on a RCIC initiation signal to allow full system flow to the Reactor Pressure Vessel (RPV). However, this design feature is not assumed in any transient analyses. Transient analyses are performed assuming the RCIC System is in the standby readiness condition when the transient occurs.

The RCIC System also monitors the water levels in the Condensate Storage Tank (CST) since this is the preferred source of water for RCIC operation. Upon receipt of a RCIC initiation signal, the CST suction valve is automatically signaled to open (it is normally in the open position) unless the pump suction from the suppression pool valves is open. If the water level in the CST falls below a preselected level, first the suppression pool suction valves automatically open, and then the CST suction valve automatically closes. Two level switches are used to detect low water level in the CST. Either switch can cause the suppression pool suction valves to open and the CST suction valve to close (i.e., one-out-of-two once logic).

(continued)

BACKGROUND (continued)

To prevent losing suction to the pump, the suction valves are interlocked so that one suction path must be open before the other automatically closes.

The RCIC System provides makeup water to the reactor until the reactor vessel water level reaches the RPV high water level trip (two-out-of-two once logic), at which time the RCIC steam supply valve closes (the injection valve also closes due to the closure of the steam supply valve). The RCIC System restarts if vessel level again drops to the low low level initiation point.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The function of the RCIC System, to provide makeup coolant to the reactor, is used to respond to transient events. The RCIC System is not an ECCS System, although the RCIC System Operation is credited during Loss of Feedwater events. Based on its contribution to the reduction of overall plant risk, however, the system, and therefore its instrumentation meets Criterion 4 of 10 CFR 50.36(c)(2)(ii). Certain instrumentation Functions are retained for other reasons and are described below in the individual Functions discussion.

The OPERABILITY of the RCIC System instrumentation is dependent upon the OPERABILITY of the individual instrumentation channel Functions specified in Table 3.3.5.~~2~~-1. Each Function must have a required number of OPERABLE channels with their setpoints within the specified Allowable Values. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions.

Allowable Values are specified for each RCIC System instrumentation Function specified in the Table. Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Value between CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal 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.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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., on-off sensor, bi-stable trip circuit, or trip unit) changes state. Margin is provided to allow for process, calibration (i.e., M&TE) and some instrument uncertainties (e.g., drift). Allowable Values derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.

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

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

1. Reactor Vessel Water Level — Low Low

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

Reactor Vessel Water Level — Low Low signals are initiated from four level switches that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

The Reactor Vessel Water Level — Low Low Allowable Value is set high enough such that for complete loss of feedwater flow, the RCIC System flow with the High Pressure Coolant Injection assumed to fail will be sufficient to maintain adequate core cooling. However, the prevention of the

1

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

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

initiation of low pressure ECCS at Reactor Vessel Water Level - Low Low Low is not assured.

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

2. Reactor Vessel Water Level — High

High RPV water level indicates that sufficient cooling water inventory exists in the reactor vessel such that there is no danger to the fuel. Therefore, the Reactor Vessel Water Level - High signal is used to close the RCIC steam supply valve to prevent overflow into the Main Steam Lines (MSLs). (The injection valve also closes due to the closure of the steam supply valve.)

Reactor Vessel Water Level — High signals for RCIC are initiated from two level switches that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

The Reactor Vessel Water Level — High Allowable Value is high enough to preclude isolating the injection valve of the RCIC during normal operation, yet low enough to trip the RCIC System prior to water overflowing into the MSLs.

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

3. Condensate Storage Tank Level — Low

Low level in the CST indicates the unavailability of an adequate supply of makeup water from this preferred source. Normally, the suction valve between the RCIC pump and the CST is open and, upon receiving a RCIC initiation signal,

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3. Condensate Storage Tank Level — Low (continued)

water for RCIC injection would be taken from the CST. However, if the water level in the CST falls below a preselected level, first the suppression pool suction valves automatically open, and then the CST suction valve automatically closes. This ensures that an adequate supply of makeup water is available to the RCIC pump. To prevent losing suction to the pump, the suction valves are interlocked so that the suppression pool suction valves must be open before the CST suction valve automatically closes.

Two level switches are used to detect low water level in the CSTs. The Condensate Storage Tank Level — Low Function Allowable Value is set high enough to ensure adequate pump suction head while water is being taken from the CST.

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

ACTIONS

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

(continued)

BASES

ACTIONS (continued)

A.1

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

B.1 and B.2

Required Action B.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in a complete loss of automatic initiation capability for the RCIC System. In this case, automatic initiation capability is lost if certain combinations of two Function 1 channels are inoperable and untripped. In this situation (loss of automatic initiation capability), the 24 hour allowance of Required Action B.2 is not appropriate, and the RCIC System must be declared inoperable within 1 hour after discovery of loss of RCIC initiation capability.

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 allowable out of service time "clock". For Required Action B.1, the Completion Time only begins upon discovery that the RCIC System cannot be automatically initiated due to the required combination of two inoperable, untripped Reactor Vessel Water Level — Low Low channels. 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 redundancy of sensors available to provide initiation signals and the fact that the RCIC System is not assumed in any accident analysis, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 1) to permit restoration of any inoperable channel to OPERABLE status.

(continued)

ACTIONS

B.1 and B.2 (continued)

If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition per Required Action B.2. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an initiation), Condition E must be entered and its Required Action taken.

C.1

A risk based analysis was performed and determined that an allowable out of service time of 24 hours (Ref. 1) is acceptable to permit restoration of any inoperable channel to OPERABLE status (Required Action C.1). A Required Action (similar to Required Action B.1) limiting the allowable out of service time, if a loss of automatic RCIC initiation capability exists, is not required. This Condition applies to the Reactor Vessel Water Level — High Function whose logic is arranged such that any inoperable channel will result in a loss of automatic RCIC shutdown on high level capability. As stated above, this loss of automatic RCIC shutdown capability was analyzed and determined to be acceptable.

D.1, D.2.1, and D.2.2

Required Action D.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in automatic suction transfer capability being lost. The automatic suction transfer capability is lost if two Function 3 channels are inoperable and untripped. In this situation (loss of automatic suction transfer), the 24 hour allowance of Required Actions D.2.1 and D.2.2 is not appropriate, and the RCIC System must be declared inoperable within 1 hour from discovery of loss of RCIC suction transfer capability. As noted, Required Action D.1 is only applicable if the RCIC pump suction is not aligned to the suppression pool since, if aligned, the Function is already performed.

(continued)

3

BASES

ACTIONS

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

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 allowable out of service time "clock." For Required Action D.1, the Completion Time only begins upon discovery that the RCIC System cannot be automatically aligned to the suppression pool due to two inoperable, untripped channels in the same Function. The 1 hour Completion Time from discovery of loss of suction transfer capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the redundancy of sensors available to provide suction transfer signals and the fact that the RCIC System is not assumed in any accident analysis, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 1) 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, the channel must be placed in the tripped condition per Required Action D.2.1, which performs the intended function of the channel (shifting the suction source to the suppression pool). Alternatively, Required Action D.2.2 allows the manual alignment of the RCIC suction to the suppression pool, which also performs the intended function. If Required Action D.2.1 or D.2.2 is performed, measures should be taken to ensure that the RCIC System piping remains filled with water. 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 RCIC discharge piping), Condition E must be entered and its Required Action taken.

E.1

With any Required Action and associated Completion Time not met, the RCIC System may be incapable of performing the intended function, and the RCIC System must be declared inoperable immediately.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

As noted in the beginning of the SRs, the SRs for each RCIC System instrumentation Function are found in the SRs column of Table 3.3.5.2-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 2 and 3; and (b) for up to 6 hours for Function 1, provided the associated Function maintains trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 1) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RCIC will initiate when necessary. Because the Ref. 1 analysis made no assumptions regarding the elapsed time between testing of consecutive channels in the same logic, it is not necessary to remove jumpers/relay blocks or reconnect lifted leads used to prevent actuation of the trip logic during testing of logic channels with instruments in series solely for the purpose of administering the AOT clocks, provided that the AOT allowance is not exceeded on a per instrument channel basis.

3

SR 3.3.5.2.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a parameter on other similar 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 will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.~~2~~.1 (continued)

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 Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.5.~~2~~.2

3

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the 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 at least once per refueling interval with applicable extenstions.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Frequency is based on the reliability analysis of Reference 1.

SR 3.3.5.~~2~~.3 and SR 3.3.5.~~2~~.4

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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Frequency is based upon the magnitude of equipment drift in the setpoint analysis.

(continued)

BASES

3

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.~~2~~.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.3 overlaps this Surveillance to provide complete testing of the safety function.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at this Frequency.

REFERENCES

1. GENE-770-06-2, "Addendum to Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

6.a. Reactor Steam Dome Pressure – High (continued)

present), yet high enough to preclude spurious isolations of shutdown cooling during system startup and operation and to provide sufficient overlap with the low pressure isolations of the HPCI and RCIC turbines to allow the transition to shutdown cooling during plant shutdowns.

This Function isolates the Group 4 valves.

6.b. Reactor Vessel Water Level — Low

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 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 Suction and MSL. The RHR Shutdown Cooling System isolation on Reactor Vessel Water Level-Low 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 when the system is in operation (i.e., the shutdown cooling suction valves are automatically isolated, and if both of the RHR shutdown cooling suction valves are not fully closed and reactor steam dome pressure is less than 135 psig (nominal), then the two inboard LPCI injection valves are also automatically isolated if a low reactor vessel water level signal is received).

Reactor Vessel Water Level — Low signals are initiated from four level indicating switches 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 Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. ~~As noted (footnote (f) to Table 3.3.6.1-1), only two channels of the Reactor Vessel Water Level — Low Function are required to be OPERABLE in MODES 4 and 5 (and must be capable of providing input to initiate the isolation of the same division of isolation valves, i.e., both the~~

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

6.b. Reactor Vessel Water Level — Low (continued)

~~A1 and B1 channels or both the A2 and B2 channels are required to be OPERABLE), provided the RHR Shutdown Cooling System integrity is maintained. System integrity is maintained provided the piping is intact and no operations with the potential for draining the reactor vessel through the system are being performed.~~

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

The Reactor Vessel Water Level — Low 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 Steam Dome 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 the Group 4 valves.

6.c. Drywell Pressure - High

High drywell pressure indicates that the RHR Shutdown Cooling System piping downstream of the inboard isolation valve located in the drywell may have experienced a break. In order to prevent the level in the RPV from dropping below the top of active fuel if this were to occur, this Function will cause the RHR Shutdown Cooling System to isolate if the system is in use (i.e., the shutdown cooling suction valves are automatically isolated, and if both of the RHR shutdown cooling suction valves are not fully closed and reactor steam dome pressure is less than 135 psig (nominal), then the two inboard LPCI injection valves are also automatically isolated if a high drywell pressure signal is received). The Drywell Pressure - High Function associated with the 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 System and MSL.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1. Reactor Vessel Water Level — Low (continued)

release. The Reactor Vessel Water Level — Low Function is one of the Functions assumed to be OPERABLE and capable of providing isolation and initiation signals. The isolation and initiation systems on and Reactor Vessel Water Level — Low support actions to ensure that any offsite releases are within the limits calculated in the safety analysis.

Reactor Vessel Water Level — Low signals are initiated from level switches that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level — Low Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Reactor Vessel Water Level-Low Allowable Value was chosen to be the same as the Reactor Protection System Reactor Vessel Level-Low Allowable Value (LCO 3.3.1.1), since this provides an early indication that the capability to cool the fuel is being threatened.

The Reactor Vessel Water Level — Low 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 SBGT System are initiated in order to minimize the potential of an offsite dose release.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

Control Building Intake Area Radiation — High (continued)

The Control Building Intake Area 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.

ACTIONS

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

A.1, and A.2

With a Control Building Intake Area Radiation-High Channel inoperable, the initiation capability of the associated SFU subsystem is lost. Therefore, the associated SFU subsystem(s) must be declared inoperable within 1 hour per Required Action A.1, or must be placed in the isolation mode of operation, (i.e., the SFU in operation and the Control Building Ventilation System isolated, within 1 hour per Required Action A.2. Placing the subsystem in the isolation mode ensures that control room personnel will be protected in the event of a Design Basis Accident. The method used to place the SFU subsystem(s) in operation must provide for automatically re-initiating the subsystem(s) upon restoration of power following a loss of power to the SFU subsystem(s).

(continued)

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 is 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, after the appropriate time delays for the Diesel Generators (DGs) to start and provide power to the 4160 VAC bus, assuming the concurrent Loss of Offsite Power (LOOP), ECCS pumps automatically start; 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 (SRVs) 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 precluding HPCI from injecting to the vessel, and the LPCI and CS subsystems cool the core.

(continued)

BASES

LCO

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

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

The LPCI System may be considered OPERABLE during alignment and operation for decay heat removal (i.e.- Shutdown Cooling) when below the actual RHR Shutdown Cooling interlock pressure in MODE 3, if capable of being manually realigned (remote or local) to the LPCI mode and not otherwise inoperable. 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. In addition, the risk of a LOCA during the transition from the RHR interlock pressure to cold shutdown is minimal.

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 $\leq$ 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 $\leq$ 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."

(continued)

INSERT B-1 (3.5.2 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, 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).

INSERT B-2 (3.5.2 LCO)

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

The Limiting Condition for Operation (LCO) requires the DRAIN TIME of RPV water inventory 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 to the RPV water level reaching the TAF.

INSERT B-3 (3.5.2 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. 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 (SBGT) 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 SBGT 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 SBGT subsystem in operation in less than the DRAIN TIME. The required verification confims actions to place a SBGT subsystem in operation are preplanned and necessary materials are available. Verification that a SBGT subsystem can be placed in operation must be performed within 4 hours. The required verification is an administrative activity and does not require manipulation or testing of equipment.

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

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

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

INSERT B-4 (SR3.5.2.1)

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 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, 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.

INSERT B-5 (SR 3.5.2.6-8)

SR 3.5.2.6

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

SR 3.5.2.7

Verifying that each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated RPV water level isolation signal is required to prevent RPV water inventory from dropping below the TAF should an unexpected draining event occur. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

INSERT B-6 (3.5.2 REF)

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.

, RPV WATER INVENTORY CONTROL,

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

B 3.5.2 ~~ECCS — Shutdown~~ ← Reactor Pressure Vessel (RPV) Water Inventory Control

BASES

BACKGROUND

~~A description of the Core Spray (CS) System is provided in the Bases for LCO 3.5.1, "ECCS Operating".~~

~~The Low Pressure Coolant Injection (LPCI) Mode of the Residual Heat Removal (RHR) System, for the application of this specification, takes on a different definition than is described in the Bases for LCO 3.5.1 "ECCS Operating". In the application of "ECCS Shutdown", the low pressure ECCS subsystems consist of two CS subsystems and two LPCI subsystems. Each LPCI subsystem consists of one motor driven RHR pump, piping, and valves to transfer water from the suppression pool to the Reactor Pressure Vessel (RPV). Only a single RHR pump is required per subsystem because of the larger injection capacity in relation to a CS subsystem.~~

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

INSERT B-1 (3.5.2 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 pump is required, post LOCA, to maintain adequate reactor vessel water level. It is reasonable to assume, based on engineering judgement, that while in MODES 4 and 5, one low pressure ECCS subsystem can maintain adequate reactor vessel water level. To provide redundancy, a minimum of two low pressure ECCS subsystems are required to be OPERABLE in MODES 4 and 5.~~

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

LCO

INSERT B-2 (3.5.2 LCO)

~~Two low pressure ECCS subsystems are required to be OPERABLE. For this specification, the low pressure ECCS subsystems consist of two CS subsystems and two LPCI subsystems. 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 Reactor Pressure~~

(continued)

BASES

LCO
(continued)

~~Vessel (RPV)*. Each LPCI subsystem consists of one motor driven RHR pump, piping, and valves to transfer water from the suppression pool to the RPV. Only a single RHR pump is required per subsystem because of the larger injection capacity in relation to a CS subsystem. In MODES 4 and 5, the RHR System cross tie valve is not required to be open. Management of gas voids is important to ECCS injection/spray subsystem OPERABILITY. The necessary portions of Emergency Service Water are also required to provide appropriate cooling to each required CS subsystem. One LPCI subsystem may be aligned for decay heat removal and considered OPERABLE for the ECCS function, if it can be manually realigned (remote or local) to the LPCI mode and is not otherwise inoperable. 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 uncovery.~~

~~* During Refuel Outage (RFO) 23, the CS minimum flow path is not required to be available for CS to be considered OPERABLE.~~

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.

~~OPERABILITY of the low pressure ECCS 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 and the water level maintained at $\geq$ 21 ft 1 inch above the RPV flange. 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 $\leq$ 100 psig, and the CS and 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 subsystems can provide sufficient flow to the vessel and because insufficient reactor pressure is available to drive the HPCI turbine.~~

(continued)

INSERT B-3 (3.5.2 ACTIONS)

BASES (continued)

ACTIONS

~~A.1 and B.1~~

~~If any one required low pressure ECCS subsystem is inoperable, the 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 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 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 Operations with a Potential for Draining the Reactor Vessel (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 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 subsystem must also be restored to OPERABLE status within 4 hours.~~

~~If at least one low pressure ECCS 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 is OPERABLE; and secondary containment isolation capability for each associated secondary containment penetration flow path not isolated that is assumed to be isolated to mitigate~~

(continued)

BASES

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

~~radioactivity releases is available (i.e., at least one secondary containment isolation valve or damper and associated instrumentation are OPERABLE, or other acceptable administrative controls to assure isolation capability. These administrative controls consist of stationing a dedicated operator who is in continuous communications with the control room, at the controls of the isolation device. In this way, the penetration can be rapidly isolated when a need for secondary containment isolation is indicated). 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. 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 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.~~

INSERT B-4 (SR3.5.2.1)

SURVEILLANCE REQUIREMENTS

SR 3.5.2.~~1~~ and SR 3.5.2.~~2~~

The minimum water level of 7.0 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 LPCI ~~System pumps~~ subsystem pump, recirculation volume, and vortex prevention. With the suppression pool water level less than the required limit, the LPCI subsystem~~(s) is (are)~~ is inoperable.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.~~1~~ and SR 3.5.2.~~2~~ (continued)

When suppression pool level is < 8.0 ft, 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 ≥ 8.0 ft or that ~~CS~~ is aligned to take suction from the CSTs and the CSTs contain ≥ 75,000 gallons of water, equivalent to 11 ft in one CST or ≥ 7 ft in both CSTs, ensures that the ~~CS System~~ can supply at least 75,000 gallons of makeup water to the RPV. ~~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.~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. ~~The Frequency of these SRs was developed considering operating experience related to suppression pool water level and CST water level variations during the applicable MODES. Furthermore, the Frequency is considered adequate in view of other indications available in the control room to alert the operator to an abnormal suppression pool or CST water level condition.~~

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 ~~3.5.2.3, SR 3.5.2.5, and SR~~ 3.5.2.~~6~~

~~The Bases provided for SR 3.5.1.1, SR 3.5.1.4, and SR 3.5.1.7 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 power operated and automatic valves in the ECCS flow path~~s~~ 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

~~* During Refuel Outage (RFO) 23, the CS minimum flow path is not required to be available for CS to be considered OPERABLE.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

5

SR 3.5.2.4 (continued)

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 manual valves unless the valves are being manipulated to serve as all or part of a system vent flow path opened under administrative control, as described in the SR Note (and Bases paragraph below). In this case, the SR Note allows the licensee to credit administratively controlled manual action to close the system vent flow path in order to maintain system Operability during system venting and performance of the gas accumulation SR. 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. The Frequency is appropriate because the valves are operated under procedural control and the probability of their being mispositioned during this time period is low.

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 a stationing of a dedicated individual at the system vent flow path who is in continuous communication with the operators in the control room. This individual will have a method to rapidly close the system vent flow path if directed.

a required

In Modes 4 and 5, the RHR System may be required to operate in the shutdown cooling mode to remove decay heat and sensible heat from the reactor. Therefore, this SR is modified by a Note that allows ~~one~~ 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 not otherwise inoperable. Alignment and operation for decay heat removal includes when the required RHR pump is not operating or when the system is realigned from or to the RHR shutdown cooling mode. Because of ~~the 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 coverage prior to postulated fuel uncovery. This will ensure adequate core cooling if an inadvertent RPV draindown should occur.~~

the restrictions on DRAIN TIME, sufficient time will be available following an unexpected draining event to manually align and initiate LPCI subsystem operation to maintain RPV water inventory prior to the RPV water level reaching the TAF

INSERT B-5 (SR 3.5.2.6-8)

INSERT B-6 (3.5.2 REF)

REFERENCES

~~1. UFSAR, Section 15.2.1.1.~~

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 Steamline Isolation Valve.

The RCIC System is designed to provide core cooling for a wide range of reactor pressures 150 psig to 1120 psig. Upon receipt of an initiation signal, the RCIC turbine accelerates to a specified speed. As the RCIC flow increases, the turbine control 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 from and 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 to prevent pump damage due to overheating when other discharge line valves are closed. To ensure rapid delivery of water to the RPV and to minimize water hammer effects, the RCIC System discharge piping is kept full of water. The RCIC System is normally aligned to the CST. The height of water in the CST is sufficient to maintain the piping full of water up to the first isolation valve. The relative height of the feedwater line connection for RCIC is such that the water in the feedwater lines keeps the remaining portion of the RCIC discharge line full of water. Therefore, RCIC does not require a "keep fill" system when its suction is aligned to the CST. When RCIC suction is aligned to the suppression pool and the system is not in operation, an alternate means of keeping the discharge piping full is required to support system OPERABILITY.

APPLICABLE SAFETY ANALYSES

The function of the RCIC System is to respond to transient events by providing makeup coolant to the reactor. The RCIC System is not an Engineered Safety Feature System and no credit is taken in the safety analyses of design basis events for RCIC System operation. Based on its contribution to the reduction of overall plant risk, however, the system satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii).

LCO

The OPERABILITY of the RCIC System provides adequate core cooling 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 subsystems can provide sufficient flow to the RPV and since RPV pressure is insufficient to drive the RCIC turbine.~~

In

RPV water inventory control is required by LCO 3.5.2, "RPV Water Level Inventory Control.

the low pressure ECCS injection/spray subsystems can provide sufficient flow to the RPV.

(continued)

BASES

ACTIONS (continued)

F.1 and F.2

If any Required Action and associated Completion Time cannot be met in MODE 1, 2, or 3, 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 experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

~~G.1 and G.2~~

~~If any Required Action and associated Completion Time cannot be met for PCIVs required to be OPERABLE in MODES 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) within the RHR Shutdown Cooling System boundary 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 shutdown cooling to remain in service while actions are being taken to restore the valve.~~

SURVEILLANCE REQUIREMENTS

SR 3.6.1.3.1

This SR ensures that the primary containment purge valves are closed as required or, if open, open for an allowable reason. If a purge valve is open in violation of this SR, the valve is considered inoperable.

If the inoperable valve is not otherwise known to have excessive leakage when closed, it is not considered to have leakage outside of limits. The SR is modified by a Note stating that the SR is not required to be met when the purge valves are open for the stated reasons. The Note states that these valves may be opened for

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

LCO

A limit that suppression pool water level be $\geq$ 10.11 ft and $\leq$ 10.43 ft 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.

The level requirements also ensure that downcomer submergence is sufficient to ensure condensation effectiveness and prevent steam bypass to the suppression chamber air space and that loads and structural integrity are acceptable.

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 requirements 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

(continued)

BASES (continued)

LCO

An OPERABLE secondary containment provides a control volume into which fission products that bypass or leak from primary containment, or are released from the reactor coolant pressure boundary components located in secondary containment, can be diluted and 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 to ensure a control volume, ~~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)~~.

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 and B.2

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 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.

~~C.1~~

~~OPDRVs can be postulated to cause fission product release to the secondary containment. In such cases, the secondary containment is the only barrier to the release of fission products to the environment.~~

~~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.~~

~~LCO 3.0.3 is not applicable in MODE 4 or 5 when OPDRVs can occur. Required Action C.1 has been modified by a Note stating that LCO 3.0.3 is not applicable.~~

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1.1 and SR 3.6.4.1.2

Verifying that secondary containment equipment hatches (e.g., the Refueling Floor roof hatch and the HPCI/RCIC room roof hatches) and that either the outer door(s) or the inner door(s) in each access opening are closed ensures that the infiltration of outside air of such a magnitude as to prevent maintaining the desired negative pressure does not occur. Verifying that all such openings are closed provides adequate assurance that exfiltration from the secondary containment will not occur. Maintaining secondary containment OPERABILITY requires verifying that either the outer door(s) or the inner door(s) in each access opening are closed. However, each secondary containment access door is normally kept closed, except when the access

(continued)

BASES (continued)

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 SCIV/Ds 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 SCIV/Ds 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).~~

ACTIONS

The ACTIONS are modified by three Notes. The first Note allows penetration flow paths to be unisolated intermittently under administrative controls. For isolation devices requiring local operation, these controls consist of stationing a dedicated operator, who is in continuous communication with the control room, at the controls of the isolation device. In this way, the penetration can be rapidly isolated when a need for secondary containment isolation is indicated. For isolation devices that can be operated remotely from the control room, the isolation device handswitch is tagged per plant procedures, identifying that the isolation device is open under administrative control and must be closed should an isolation signal occur. In the event of an isolation signal, plant procedures direct control room operators to verify all automatic actions occur, and to manually initiate those automatic actions that should have occurred but did not. This will ensure the control room operators verify any isolation devices open under administrative control close in response to an isolation signal. If any of the open isolation devices are unable or fail to close automatically, the control room operators will manually close them.

Note 1 also expands upon the allowance of LCO 3.0.5, which would only allow the penetration to be opened for testing, by allowing the penetration to be opened for other operational reasons, such as draining, venting, etc. The second Note provides clarification that for the purpose of this LCO separate Condition entry is allowed for each penetration flow path. This is acceptable, since the Required Actions for each Condition

(continued)

BASES (continued)

ACTIONS

C.1 and C.2 (continued)

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~~

~~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. 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.~~

~~LCO 3.0.3 is not applicable while in MODE 4 or 5 when OPDRVs can occur. Required Action D.1 has been modified by a Note stating that LCO 3.0.3 is not applicable.~~

SURVEILLANCE REQUIREMENTS

SR 3.6.4.2.1

Verifying that the isolation time of each power operated automatic SCIV/D is within limits is required to demonstrate OPERABILITY. The isolation time test ensures that the SCIV/D will isolate in a time period less than or equal to that assumed in the safety analyses. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.4.2.2

Verifying that each automatic SCIV/D closes on a secondary containment isolation signal is required to prevent leakage of radioactive material from secondary containment following a DBA or which are released during certain operations when primary containment is not required to be OPERABLE or take place outside primary containment. This SR ensures that each automatic SCIV/D will actuate to the isolation position on a secondary containment isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.6.2, "Secondary Containment Isolation Instrumentation," overlaps this SR to provide complete testing of the safety function. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Frequency is based

(continued)

BASES (continued)

LCO

Following a DBA, a minimum of one SBGT subsystem is required to maintain the secondary containment at a negative pressure with respect to the environment and to process gaseous releases. Meeting the LCO requirements for two OPERABLE subsystems ensures operation of at least one SBGT subsystem in the event of a single active failure.

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, SBGT 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 SBGT 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)~~.

ACTIONS

A.1

With one SBGT subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status in 7 days. In this Condition, the remaining OPERABLE SBGT 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 SBGT subsystem and the low probability of a DBA occurring during this period.

(continued)

BASES

ACTIONS
(continued)

B.1 and B.2

If the SBGT 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 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.

~~C.1 and C.2~~

~~During OPDRVs, when Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE SBGT 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, 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.~~

~~LCO 3.0.3 is not applicable in MODE 4 or 5 when OPDRVs can occur. The Required Actions of Condition C have been modified by a Note stating that LCO 3.0.3 is not applicable.~~

C

~~D~~.1

If both SBGT subsystems are inoperable in MODE 1, 2, or 3, the SBGT System may not be capable of supporting the required radioactivity release control function. Therefore, actions are required to enter LCO 3.0.3 Immediately.

(continued)

BASES

ACTIONS (continued)

~~E.1~~

~~When two SBGT subsystems are inoperable, 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.~~

~~LCO 3.0.3 is not applicable in MODE 4 or 5 when OPDRVs can occur. Required Action E.1 has been modified by a Note stating that LCO 3.0.3 is not applicable.~~

SURVEILLANCE REQUIREMENTS

SR 3.6.4.3.1

Operating each SBGT subsystem ensures that both subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage or fan or motor failure, can be detected for corrective action. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Frequency was developed in consideration of the known reliability of fan motors and controls and the redundancy available in the system, however these components are not the most-limiting for overall system reliability at this SR Frequency.

SR 3.6.4.3.2

This SR verifies that the required SBGT filter testing is performed in accordance with Specification 5.5.7, Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, system flow capability, 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.

(continued)

BASES

LCO (continued)

In order for the SFU subsystems to be considered OPERABLE, the CBE boundary must be maintained such that the CBE occupant dose from a large radioactive release does not exceed the calculated dose in the licensing basis consequence analyses for DBAs. In the event of an inoperable CBE boundary in MODES 1, 2, or 3, mitigating actions are required to ensure CBE occupants are protected from hazardous chemicals and smoke.

DAEC does not have automatic SFU actuation for hazardous chemicals or smoke. Current practices at DAEC do not utilize chemicals in sufficient quantity to present a chemical hazard to the CBE. Smoke is not considered in the DAEC safety analysis. Therefore, there are no specific limits at DAEC for hazardous chemicals or smoke.

The LCO is modified by a Note allowing the CBE boundary to be opened intermittently under administrative controls. This Note only applies to openings in the CBE boundary that can be rapidly restored to the design condition, such as doors, hatches, floor plugs, and access panels. For entry and exit through the doors the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings these controls should be proceduralized and consist of stationing a dedicated individual at the opening who is in continuous communication with the operators in the CBE. This individual will have a method to rapidly close the opening and to restore the CBE boundary to a condition equivalent to the design condition when a need for CBE isolation is indicated.

APPLICABILITY

In MODES 1, 2, and 3, the SFU System must be OPERABLE to ensure that the CBE 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 SFU 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 a Potential for Draining the Reactor Vessel (OPDRVs);~~

(continued)

BASES

APPLICABILITY (continued)

~~b.~~ During CORE ALTERATIONS; and

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

ACTIONS

A.1

With one SFU subsystem inoperable, for reasons other than an inoperable CBE boundary, the inoperable SFU subsystem must be restored to OPERABLE status within 7 days. With the unit in this condition, the remaining OPERABLE SFU subsystem is adequate to perform the CBE occupant protection function. However, the overall reliability is reduced because a failure in the OPERABLE subsystem could result in loss of the SFU 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 the CBE boundary and into the CBE can result in CBE occupant radiological dose greater than the calculated dose of the licensing basis analyses of DBA consequences (allowed to be up to 5 rem TEDE), the CBE boundary is inoperable. As discussed in the Applicable Safety Analyses section, the DAEC licensing basis identifies that CBE inleakage limits for hazardous chemicals and smoke are not necessary to protect the CBE occupants. Allowing verification by administrative means for hazardous chemicals and smoke is considered acceptable, since the limit established for radiological events is the limiting value for determining entry into Condition B for an inoperable CBE boundary. These administrative controls consist of the following:

- Verification that the periodic check of onsite and offsite hazardous chemical sources has been performed within the last year; and
- Verification that the smoke analysis of Reference 7 remains valid and current.

(continued)

BASES

ACTIONS (continued)

C.1 and C.2 (continued)

and

conditions from full power conditions in an orderly manner and without challenging unit systems.

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

LCO 3.0.3 is not applicable in MODE 4 or 5. However, since irradiated fuel assembly movement can occur in MODE 1, 2, or 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.

or

During movement of irradiated fuel assemblies in the secondary containment~~,~~ during CORE ALTERATIONS, ~~or during OPDRVs,~~ if the inoperable SFU subsystem cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE SFU subsystem may be placed in the isolation mode (i.e., one SFU subsystem in operation with the control building isolated). 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 CBE. 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, action must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Action must continue until the OPDRVs are suspended.~~

E.1

If both SFU subsystems are inoperable in MODE 1, 2, or 3 for reasons other than an inoperable CBE boundary (i.e., Condition B), the SFU System may not be capable of performing the intended function and the unit is in a condition outside of the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

(continued)

BASES

and

ACTIONS (continued)

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

LCO 3.0.3 is not applicable in MODE 4 or 5. However, since irradiated fuel assembly movement can occur in MODE 1, 2, or 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.

or

During movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, ~~or during OPDRVs,~~ with two SFU subsystems inoperable, or with one or more SFU subsystems inoperable due to an inoperable CBE boundary, action must be taken immediately to suspend activities that present a potential for releasing radioactivity that might require isolation of the CBE. 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, action must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Action must continue until the OPDRVs are suspended.

SURVEILLANCE REQUIREMENTS

SR 3.7.4.1

Operating each SFU subsystem for ≥ 15 minutes ensures that both subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage or fan or motor failure, can be detected for corrective action. Since the SFU charcoal is tested at a Relative Humidity ≥ 95%, extended operation of the electric heaters is not required. Thus, each subsystem need only be operated for ≥ 15 minutes to demonstrate the function of each subsystem. The function of the SFU electric heaters is to pre-heat incoming air to above 40°F to ensure adsorption occurs within the temperature range that charcoal testing is performed. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Frequency was developed in consideration of the known reliability of fan motors and controls and the redundancy available in the system.

(continued)

BASES (continued)

LCO

Two independent and redundant subsystems of the CBC System are required to be OPERABLE to ensure that at least one is available, assuming a single failure disables the other subsystem. Total system failure could result in the equipment operating temperature exceeding limits.

The CBC System is considered OPERABLE when the individual components necessary to maintain the control building temperature are OPERABLE in both subsystems. These components include the cooling coils, fans, chillers, compressors, ductwork, dampers, and associated instrumentation and controls. A CBC is considered inoperable if it trips and cannot be promptly restarted. Therefore, a CBC that spuriously trips and can subsequently be restarted in a reasonable period of time, is not considered inoperable. In addition, during conditions in MODES other than MODES 1, 2, and 3 when the CBC System is required to be OPERABLE (e.g., during CORE ALTERATIONS), the necessary portions of the ESW System, RWS System, and the Ultimate Heat Sink are also required as part of the OPERABILITY requirements covered by this LCO.

APPLICABILITY

In MODE 1, 2, or 3, the CBC System must be OPERABLE to ensure that the control building temperature will not exceed equipment OPERABILITY limits.

In MODES 4 and 5, the probability and consequences of a Design Basis Accident (DBA) are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining the CBC 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 a Potential for Draining the Reactor Vessel (OPDRVs);~~

a → ~~b.~~ During CORE ALTERATIONS; and

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

(continued)

BASES

ACTIONS (continued)

and

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

LCO 3.0.3 is not applicable in MODE 4 or 5. However, since irradiated fuel assembly movement can occur in MODE 1, 2, or 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.

or

During movement of irradiated fuel assemblies in the secondary containment~~,~~ during CORE ALTERATIONS, ~~or during OPDRVs,~~ if Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE CBC subsystem may be placed immediately in operation. This action ensures that the remaining subsystem is OPERABLE, that no failures that would prevent 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 control room. This places the unit in a condition that minimizes 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 subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.~~

and

E.1, E.2~~, and E.3~~

LCO 3.0.3 is not applicable in MODE 4 or 5. However, since irradiated fuel assembly movement can occur in MODE 1, 2, or 3, the Required Actions of Condition E 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 a sufficient reason to require a reactor shutdown.

(continued)

BASES

ACTIONS

and

E.1, E.2, ~~and E.3~~ (continued)

or

During movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, ~~or during OPDRVs~~, if Required Actions B.1 and B.2 cannot be met within the required Completion Times, action must be taken to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the control building. This places the unit in a condition that minimizes risk.

If applicable, CORE ALTERATIONS and handling of irradiated fuel 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 subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.~~

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

This SR verifies that the heat removal capability of the system is sufficient to remove available control building heat load. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Frequency is appropriate since significant degradation of the CBC System is not expected over this time period.

REFERENCES

1. UFSAR, Section 9.4.4.2.

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 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 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 shutdown 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

(continued)

BASES

LCO (continued)

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 offsite circuit(s) must be capable of maintaining rated frequency and voltage while connected to their respective essential bus(es), and of accepting required loads during an accident. Qualified offsite circuits are those that are described in the UFSAR and are part of the licensing basis for the unit. The required offsite circuit consists of either: 1) the incoming autotransformer (T1) and disconnect (1401, 6782, 2812 or 4731), the incoming circuit breaker (8490) and disconnect (8491), the underground 34.5 kV line, the standby transformer (1X4), the 4160 volt supply line and one of the two supply circuit breakers (1A301 or 1A401) to essential buses 1A3 or 1A4, respectively, or 2) the incoming circuit breaker (5550 or 5560) and disconnect (5551 or 5555, respectively), the overhead 161 kV line, the startup transformer (1X3), one of the two 4160 volt supply lines and one of the two supply circuit breakers (1A302 or 1A402) to essential buses 1A3 or 1A4, respectively, if required by LCO 3.8.8.

The required DG must be capable of starting, accelerating to rated speed and voltage, connecting to its respective essential bus on detection of bus undervoltage, and accepting required loads. 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 essential buses. The necessary portions of Emergency Service Water are also required to provide appropriate cooling to each required DG.

Proper sequencing of loads, including non-essential load shedding capability, is a required function for DG OPERABILITY.

In addition, proper timed logic sequence operation, is an integral part of offsite circuit OPERABILITY since its inoperability could impact the ability to start and maintain energized loads required OPERABLE by LCO 3.8.8. No automatic transfer capability is required for offsite circuits to be considered OPERABLE during shutdown conditions.

(continued)

BASES (continued)

that provide core cooling are available

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:

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.

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

An offsite circuit is considered inoperable if it is not available to supply power to either of the essential buses. If both essential 4.16 kV buses are required per LCO 3.8.8, one division with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS~~,~~ and fuel movement~~, and operations with a potential for draining the reactor vessel~~. By the allowance of the option to declare required

(continued)

BASES (continued)

ACTIONS

A.1 (continued)

features inoperable that are not powered from offsite power, appropriate restrictions can be implemented in accordance with the affected required 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.

and

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

With the required offsite circuit not available to either division, the option still exists to declare all affected required features inoperable per required Action A.1. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With the required DG inoperable, the minimum required diversity of AC power sources is not 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

(continued)

and

BASES

ACTIONS

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

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 essential 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 division is de-energized. LCO 3.8.8 provides the appropriate restrictions for the situation involving a de-energized division.

SURVEILLANCE REQUIREMENTS

SR 3.8.2.1

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the AC sources in other than MODES 1, 2, and 3. SR 3.8.1.8 is not required to be met since only one offsite circuit is 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 two Notes. The reason for Note 1 is to preclude requiring the OPERABLE DG(s) from being paralleled with the offsite power network or otherwise rendered inoperable during the performance of SRs, and to preclude deenergizing a required 4160 V essential 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 is required to be OPERABLE.

Note 2 states that SR 3.8.1.13 is considered to be met without the ECCS initiation signals OPERABLE when the ECCS initiation signals are not required to be OPERABLE per Table 3.3.5.1-1. This SR demonstrates the DG response to an ECCS signal (either alone or in conjunction with a loss-of-power signal). This is consistent with the ECCS instrumentation requirements of Table 3.3.5.1-1 that do not require the ECCS signals to be OPERABLE in MODES 4 and 5 when ECCS is not required to be OPERABLE ~~per LCO 3.5.2, "ECCS-Shutdown"~~.

REFERENCES None.

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 15 (Ref. 1), assume that Engineered Safety Feature Systems are OPERABLE. The 125 VDC 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 and during movement of irradiated fuel assemblies in the Secondary Containment.

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

(continued)

BASES (continued)

LCO

The DC electrical power subsystems — with: Division I and Division II 125 VDC subsystems each consisting of one 125 V battery, the associated battery charger or the swing battery charger and the corresponding control equipment and interconnecting cabling supply power to the associated distribution system; and, the 250 VDC subsystem consisting of the 250V battery, one of the two battery chargers and the corresponding control equipment and interconnecting cabling sufficient to provide electrical power to the outboard RHR-SDC suction isolation valve (MO-1909), are required to be OPERABLE to support required DC distribution subsystems required OPERABLE by LCO 3.8.8, "Distribution Systems —Shutdown." 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~~;

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.

(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, A.2.1, A.2.2, ~~A.2.3,~~ and A.2.4 → 3

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 the secondary ~~containment, and any activities that could result in inadvertent draining of the reactor vessel~~).

and → ~~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 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.

(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 15 (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 10 CFR 50.36(c)(2)(ii).

(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 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, 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;

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.

(continued)

BASES (continued)

APPLICABILITY (continued)

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.

4

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 Divisions of electrical power distribution subsystems to be OPERABLE, one OPERABLE distribution subsystem division 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 associated with an inoperable distribution subsystem inoperable, appropriate restrictions are implemented in accordance with the affected distribution subsystem LCO's Required Actions. 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~~).

(continued)

BASES (continued)

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.

Not withstanding 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 distribution subsystems should be completed as quickly as possible in order to minimize the time the plant safety systems may be without power.

(continued)

In the unlikely event of any primary system leak that could result in draining the RPV,

BASES

APPLICABLE SAFETY ANALYSES (continued)

these requirements will conservatively limit radiation releases to the environment.

makeup

~~Hydrostatic and leak testing, in and of themselves, are not considered to be Operations with the Potential for Draining the Reactor Vessel (OPDRVs). However, 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.

RPV Water Inventory Control

RPV water level above the TAF

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.

As described in LCO 3.0.7, compliance with Special Operations LCOs is optional, and therefore, no criteria of 10 CFR 50.36(c)(2)(ii) 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.

LCO

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 some system leakage or hydrostatic testing may require the safety/relief valves to be gagged, preventing their OPERABILITY. Additionally, even with required minimum reactor coolant temperature ≤ 212°F, RCS temperatures may drift above 212°F during the performance of system leakage and hydrostatic testing or during subsequent control rod scram time testing, which is typically performed in conjunction with a system leakage or hydrostatic test. While this Special Operations LCO is provided for system leakage and hydrostatic testing, and for scram time testing initiated in conjunction with a system leakage or

(continued)