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10 CFR 50.90

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington D.C. 20555-0001

Subject: **Docket Nos. 50-361 and 50-362**
Amendment Applications 258 and 244
Technical Specifications Applicable to
Movement of Fuel Assemblies
San Onofre Nuclear Generating Station, Units 2 and 3

Reference: NRC ADMINISTRATIVE LETTER 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety", December 29, 1998

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Southern California Edison (SCE) hereby submits license amendment applications 258 and 244 to operating licenses NPF-10 and NPF-15 for San Onofre Units 2 and 3, respectively. Amendment Applications 258 and 244 consist of the enclosed Proposed Change Number (PCN) 593.

Per 10 CFR 50 appendix B section XVI, Corrective Action, SCE has identified that the current applicability of several of the Technical Specifications is insufficient to assure plant safety. SCE implemented administrative controls in October 2008, in accordance with NRC Administrative Letter 98-10 (Referenced), to apply revised applicability until such time when the NRC completes its review and issues revised Technical Specification pages. As a corrective action to the identified deficiency, this proposed license amendment request provides new applicability language that includes the movement of non-irradiated fuel assemblies.

The Enclosure to this letter provides the Description and No Significant Hazards Consideration for the proposed amendments. SCE has determined that there is no significant hazards consideration associated with the proposed change and that the change is exempt from environmental review pursuant to the provisions of 10 CFR 51.22 (c) (9).

SCE requests approval of these proposed license amendments to be made effective upon issuance, and to be implemented within 60 days.

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A list of regulatory commitments associated with these proposed amendments is provided in the Enclosure.

If you have any questions or require any additional information, please contact Ms. Linda T. Conklin at (949) 368-9443.

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

Executed on: 1-14-10
(Date)

Sincerely,

Ross T. Ridenoure

Enclosure:

PCN-593 with Attachments

1. List of Regulatory Commitments
2. Proposed Technical Specifications Markup Pages, Unit 2
3. Proposed Technical Specifications Markup Pages, Unit 3
4. Proposed Technical Specifications Pages, Unit 2
5. Proposed Technical Specifications Pages, Unit 3
6. Proposed Technical Specifications Bases Markup Pages, Unit 2 (For Information Only)
7. Proposed Technical Specifications Bases Markup Pages, Unit 3 (For Information Only)

cc: E. E. Collins, Regional Administrator, NRC Region IV
R. Hall, NRC Project Manager, San Onofre Units 2 and 3
G. G. Warnick, NRC Senior Resident Inspector, San Onofre Units 2 and 3
S. Y. Hsu, California Department of Public Health, Radiologic Health Branch

ENCLOSURE

EVALUATION OF THE PROPOSED CHANGE

PCN-593

Movement of Fuel Assemblies

ATTACHMENTS:

1. List of Regulatory Commitments
2. Proposed Technical Specifications Markup Pages, Unit 2
3. Proposed Technical Specifications Markup Pages, Unit 3
4. Proposed Technical Specifications Pages, Unit 2
5. Proposed Technical Specifications Pages, Unit 3
6. Proposed Technical Specifications Bases Markup Pages, Unit 2 (For Information Only)
7. Proposed Technical Specifications Bases Markup Pages, Unit 3 (For Information Only)

1. SUMMARY DESCRIPTION

PCN-593 requests to amend Operating Licenses NPF-10 and NPF-15 for San Onofre Nuclear Generating Station (SONGS) Units 2 and 3, respectively.

This license amendment request will revise Technical Specifications (TS):

- LCO 3.3.8, "Containment Purge Isolation Signal (CPIS)"
- LCO 3.3.9, "Control Room Isolation Signal (CRIS)"
- LCO 3.7.11, "Control Room Emergency Air Cleanup System (CREACUS)"
- LCO 3.7.16, "Fuel Storage Pool Water Level"
- LCO 3.8.2, "AC Sources – Shutdown"
- LCO 3.8.5, "DC Sources – Shutdown"
- LCO 3.8.8, "Inverters – Shutdown"
- LCO 3.8.10, "Distribution Systems – Shutdown"
- LCO 3.9.3, "Containment Penetrations"
- LCO 3.9.6, "Refueling Water Level"

The proposed changes will revise the applicability of these Technical Specifications to add a new specified condition to the Applicability statement. The proposed specified condition will apply to movement of any fuel assembly (irradiated or non-irradiated) over irradiated fuel assemblies in containment or the fuel storage pool. The added specific condition of movement of non-irradiated fuel assemblies is achieved by deleting the word "irradiated."

2. DETAILED DESCRIPTION

This proposed change revises applicability wording regarding the movement of fuel assemblies in containment and in the fuel storage pool.

Containment Example:

LCO 3.3.8, "Containment Purge Isolation Signal (CPIS)":

[Existing] MODES 1, 2, 3, 4,
During CORE ALTERATIONS,
During movement of irradiated fuel assemblies within containment.

[New] MODES 1, 2, 3, 4,
During CORE ALTERATIONS,
During movement of fuel assemblies within containment.

Fuel Storage Pool Example:

LCO 3.7.16, "Fuel Storage Pool Water Level":

[Existing] During movement of irradiated fuel assemblies in the fuel storage pool.

[New] During movement of fuel assemblies in the fuel storage pool.

Containment and Fuel Storage Pool Example:

LCO 3.7.11, "Control Room Emergency Air Cleanup System" (CREACUS)

[Existing] MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies

[New] MODES 1, 2, 3, 4, 5, and 6,
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

3. TECHNICAL EVALUATION

3.1 Background

In 1996 SONGS adopted Technical Specifications based on NUREG-1432, "Standard Technical Specifications - Combustion Engineering Reactors," September 1992. The current SONGS applicability statements are consistent with NUREG 1432, Revision 3.

The previous design analysis of record (Reference 1) for a failed fuel assembly in the fuel storage pool is 60 fuel rods which is the largest number of fuel rods that could fail from the worst postulated assembly drop. All 60 failed fuel rods were contained in the dropped assembly and the impacted assembly did not have any failed fuel rods. The original design analysis for failed fuel assemblies in the core is a maximum of 226 fuel rods which is the result of a vertical drop of a fuel assembly onto the fuel bundles in a partially loaded core.

Consequently, the existing SONGS Technical Specifications related to protection against the consequences of a Fuel Handling Accident are applicable during movement of irradiated fuel assemblies.

3.2 Discussion

A new analysis, "Updated SONGS 2 & 3 Fuel Assembly Drop Analysis of Record" (AOR) (Reference 2) was performed and has subsequently replaced the Fuel Bundle Drop Fuel Rod Failure Evaluation for SCE Units 2 & 3 (Reference 1). The AOR documents fuel rod damage predicted to result from horizontal and vertical drop scenarios in the fuel storage pool and the core. Starting in 1995, fuel bundle weights increased due to changes in fuel assembly cladding. The new AOR (Reference 2) uses the heavier bundle weights and also includes the weights of components (i.e., CEA, neutron source, etc.), handling grapples, and a discretionary margin of 50 pounds which have not been accounted for in previous fuel assembly drop fuel rod failure analyses. The new conservative assembly drop weight is less than the maximum weight used to analyze the spent fuel racks and evaluate the spent fuel pool liner plate. Thus, the existing spent fuel rack and spent fuel pool liner plate analysis results remain applicable.

The updated analysis (Reference 2), calculates the predicted number of fuel rod failures for various fuel designs (standard and high density fuel pellets with zirconium based cladding) and for various fuel bundle weight combinations (bundle / discretionary weight / grapple weight). For fuel bundle drop scenarios in the fuel storage pool and core locations, the results of the updated analysis demonstrate that the maximum total number of fuel rods predicted to fail in the dropped and impacted fuel bundles is a total of 472 rods (this represents all fuel rods in both assemblies).

The control room and offsite dose consequences of 472 rods being failed were evaluated and determined to meet the 10 CFR 50.59 minimal dose increase criterion as defined in Regulatory Guide 1.187.

The existing Technical Specification applicability statements relevant to fuel movement refer to movement of irradiated fuel assemblies. The current applicability related to movement of fuel in the fuel storage pool is based in part on the assumption that no impacted fuel is damaged as a result of a dropped assembly. Under the existing SONGS Technical Specifications, movement of non-irradiated fuel assemblies is treated differently than movement of irradiated fuel assemblies because under the AOR, a dropped non-irradiated fuel assembly would not result in any radiological consequences in the fuel storage pool.

The Updated SONGS 2 & 3 Fuel Assembly Drop Analysis of Record shows that impacted fuel assemblies may be damaged as a result of a dropped assembly. As a result, a drop of a non-irradiated fuel assembly could have radiological consequences. The applicability statements for the various Technical Specifications relevant to fuel movement should include movement of non-irradiated fuel assemblies (e.g., new fuel assemblies that have not been irradiated, or the dummy fuel assembly used for equipment testing).

The current Technical Specifications are insufficient to assure plant safety because they are not applicable when moving non-irradiated fuel over irradiated fuel. Revising the applicability will ensure that those systems, structures, and components that are required by the Technical Specifications to protect against a Fuel Handling Accident are OPERABLE whenever there is a potential to damage irradiated fuel.

SCE is considering performing an additional analysis to determine if the current conclusion that impacted fuel would be damaged is overly conservative. Any such analysis, however, would not be completed within the next year.

4. REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

Appendix A to Part 50 – General Design Criteria for Nuclear Power Plants

VI. Fuel and Radioactivity Control

Criterion 60--Control of releases of radioactive materials to the environment. The nuclear power unit design shall include means to control suitably the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid wastes produced during normal reactor operation, including anticipated operational occurrences. Sufficient holdup capacity shall be provided for retention of gaseous and liquid effluents containing radioactive materials, particularly where unfavorable site environmental conditions can be expected to impose unusual operational limitations upon the release of such effluents to the environment.

Criterion 61--Fuel storage and handling and radioactivity control. The fuel storage and handling, radioactive waste, and other systems which may contain radioactivity shall be designed to assure adequate safety under normal and postulated accident conditions. These systems shall be designed (1) with a capability to permit appropriate periodic inspection and testing of components important to safety, (2) with suitable shielding for radiation protection, (3) with appropriate containment, confinement, and filtering systems, (4) with a residual heat removal capability having reliability and testability that reflects the importance to safety of decay heat and other residual heat removal, and (5) to prevent significant reduction in fuel storage coolant inventory under accident conditions.

Criterion 62--Prevention of criticality in fuel storage and handling. Criticality in the fuel storage and handling system shall be prevented by physical systems or processes, preferably by use of geometrically safe configurations.

Criterion 63--Monitoring fuel and waste storage. Appropriate systems shall be provided in fuel storage and radioactive waste systems and associated handling areas (1) to detect conditions that may result in loss of residual heat removal capability and excessive radiation levels and (2) to initiate appropriate safety actions.

Criterion 64--Monitoring radioactivity releases. Means shall be provided for monitoring the reactor containment atmosphere, spaces containing components for recirculation of loss-of-coolant accident fluids, effluent discharge paths, and the plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences, and from postulated accidents.

The proposed change does not affect any design features or processes related to fuel storage or radioactivity control.

4.2 PRECEDENT

Based upon industry review and communications with the Technical Specifications Task Force that reports to the Pressurized Water Reactor Owners' Group and the Boiling Water Reactor Owners' Group, there is no related precedent.

4.3 No Significant Hazards Consideration

Southern California Edison (SCE) has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the standards set forth in 10 CFR 50.92, issuance of Amendment, as discussed below:

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

Response: No.

This proposed change revises Technical Specifications applicability wording regarding the movement of fuel assemblies in containment and the fuel storage pool at the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 to include the movement of both irradiated and non-irradiated fuel assemblies. The proposed applicability is more comprehensive than the current Applicability.

Expanding the applicability of the relevant Technical Specifications is necessary to account for updated fuel drop analyses which demonstrate that impacted spent fuel assemblies may be damaged. Consequently, movement of non-irradiated fuel assemblies could result in a Fuel Handling Accident that has radiological consequences. Changing the applicability of the relevant Technical Specifications does not affect the probability of a Fuel Handling Accident. The

expanded applicability provides assurance that equipment designed to mitigate a Fuel Handling Accident is capable of performing its specified safety function, such that the consequences of an accident are not increased.

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

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

Response: No.

The revised spent fuel drop analyses demonstrate that impacted fuel assemblies may be damaged as the result of a dropped fuel assembly. The existing SONGS Technical Specifications regarding movement of fuel assemblies are not applicable for movement of non-irradiated fuel assemblies. A drop of a non-irradiated fuel assembly that has radiological consequences could occur during periods when equipment that would be required to mitigate those consequences is not required to be OPERABLE in accordance with the existing Technical Specifications.

The proposed changes to the Technical Specifications applicability language regarding the movement of fuel assemblies in containment and the fuel storage pool at SONGS Units 2 and 3 ensure that Limiting Conditions of Operation and appropriate Required Actions for required equipment are in effect during fuel movement. This provides assurance that any Fuel Handling Accident that may occur will remain within the initial assumptions of accident analyses.

Consequently, there is no possibility of a new or different kind of accident due to this change.

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

Response: No.

The proposed Technical Specifications change will not affect protection criterion for plant equipment and will not reduce the margin of safety. By extending the Applicability to the movement of non-irradiated fuel assemblies, the current margin of safety is maintained.

Consequently, there is no significant reduction in a margin of safety due to this change.

Based on the above, SCE concludes that the proposed amendments present no significant hazards consideration under the substance set forth in 10 CFR 50.92 (c), and accordingly, a finding of no significant hazards consideration is justified.

4.4 Conclusions

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

5. ENVIRONMENTAL CONSIDERATION

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

6.0 REFERENCES

1. SO23-990-C437, Revision 0, Fuel Bundle Drop Evaluation for SCE Units 2 & 3

2. SO23-990-C467, Revision 0, Updated SONGS 2 & 3 Fuel Assembly Drop Analysis of Record

Attachment 1

List of Regulatory Commitments

List of Regulatory Commitments

The following table identifies the regulatory commitment in this document. Any other statements in this submittal represent intended or planned actions. They are provided for information purposes and are not considered to be regulatory commitments.

COMMITMENT	TYPE		SCHEDULED COMPLETION DATE (if applicable)
	One-time	Continuing Compliance	
1) SONGS will continue to implement revised applicability of Technical Specifications that are pertinent to the movement of fuel assemblies using administrative controls in accordance with NRC Administrative Letter 98-10.		X	Until NRC completes its Review and issues Revised Technical Specification Pages

Attachment 2

Proposed Technical Specifications Markup Pages, Unit 2

3.3 INSTRUMENTATION

3.3.8 Containment Purge Isolation Signal (CPIS)

LCO 3.3.8 One CPIS channel shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
During CORE ALTERATIONS,
During movement of ~~irradiated~~ fuel assemblies within containment.

----------NOTE----------
Only required when the penetration is not isolated by appropriate closed and de-activated automatic valve(s), closed manual valve(s), or blind flange(s).

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. CPIS Actuation Logic, or one or more required channels of containment airborne radiation monitors inoperable in MODES 1, 2, 3, and 4.	A.1	Enter applicable Conditions and Required Actions for affected valves of LCO 3.6.3, "Containment Isolation Valves," made inoperable by CPIS instrumentation.	Immediately
B. Required Action and associated Completion Time not met in MODES 1, 2, 3, or 4.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more required channels of containment airborne radiation monitors inoperable in MODES 1, 2, 3, and 4.	C.1 Enter applicable conditions and required actions of LCO 3.4.15, "RCS Leak Detection."	Immediately
D. CPIS Manual Trip, Actuation Logic, or one or more required channels of containment airborne radiation monitors inoperable during CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies within containment.	----------NOTE---------- The provisions of LCO 3.0.3 are not applicable. ---------- D.1 Place and maintain containment purge supply and exhaust valves in closed position. OR D.2.1 Suspend CORE ALTERATIONS. AND D.2.2 Suspend movement of ~~irradiated~~ fuel assemblies in containment.	 Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform a CHANNEL CHECK on required containment airborne radiation monitor channel.	12 hours

(continued)

3.3 INSTRUMENTATION

3.3.9 Control Room Isolation Signal (CRIS)

LCO 3.3.9 One CRIS channel shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of ~~irradiated~~ fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

----------NOTES----------
1. The provisions of LCO 3.0.3 are not applicable.
2. The provisions of LCO 3.0.4 are not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CRIS Manual Trip, Actuation Logic, or one required channel of control room airborne radiation monitors inoperable in MODES 1, 2, 3, or 4.	A.1 --------NOTE-------- Place Control Room Emergency Air Cleanup System (CREACUS) in isolation mode if automatic transfer to isolation mode inoperable. ---------- Place one CREACUS train in emergency mode.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. CRIS Manual Trip, Actuation Logic, or required control room airborne radiation monitors inoperable in MODE 5 or 6, or during movement of ~~irradiated~~ fuel assemblies within containment, or during the movement of fuel assemblies within the fuel storage pool.	B.1 --------NOTE-------- Place CREACUS in isolation mode if automatic transfer to isolation mode inoperable. ---------- Place one CREACUS train in emergency mode.	Immediately
	OR	
	B.2.1 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately
	AND	
	B.2.2 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	B.2.~~2~~3 --------NOTE-------- Limited plant control operations are allowed provided the changes are accounted for in the calculated SDM. ---------- Suspend positive reactivity additions.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform a CHANNEL CHECK on the required control room airborne radiation monitor channel.	12 hours

(continued)

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

LCO 3.7.11 Two CREACUS trains shall be OPERABLE.

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

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of ~~irradiated~~ fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

----------NOTES----------
1. The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration.

2. Each Unit shall enter applicable ACTIONS separately.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREACUS train inoperable for reasons other than Condition B.	A.1	Restore CREACUS train to OPERABLE status.	14 days
B. One or more CREACUS trains inoperable due to inoperable CRE boundary in Modes 1, 2, 3, or 4.	B.1	Initiate action to implement mitigating actions.	Immediately
	AND		
	B.2	Verify mitigating actions ensure CRE occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.	24 hours •
	AND		
	B.3	Restore CRE boundary to OPERABLE status.	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, 3, or 4.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours
D. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of ~~irradiated~~ fuel assemblies within containment, or during the movement of fuel assemblies within the fuel storage pool.	D.1 Place OPERABLE CREACUS train in emergency radiation protection mode. OR D.2.1 Suspend CORE ALTERATIONS. AND D.2.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment. AND D.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately Immediately Immediately Immediately

ACTIONS (continued)

E. Two CREACUS trains inoperable in MODE 5 or 6, or during movement of ~~irradiated~~ fuel assemblies within containment, or during the movement of fuel assemblies in the fuel storage pool.	E.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	E.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately
	AND	
OR	E.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
One or more CREACUS trains inoperable due to an inoperable CRE boundary in MODE 5 or 6, or during movement of ~~irradiated~~ fuel assemblies within containment, or during the movement of fuel assemblies in the fuel storage pool.		

(continued)

3.7 PLANT SYSTEMS

3.7.16 Fuel Storage Pool Water Level

LCO 3.7.16 The fuel storage pool water level shall be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: During movement of ~~irradiated~~ fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage pool water level not within limit.	A.1 --------NOTE-------- LCO 3.0.3 is not applicable. ---------- Suspend movement of ~~irradiated~~ fuel assemblies in fuel storage pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool water level is ≥ 23 ft above the top of irradiated fuel assemblies seated in the storage racks.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources – Shutdown

LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

a. One qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems Shutdown"; and

b. One diesel generator (DG) capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10.

APPLICABILITY: MODES 5 and 6,
During movement of ~~irradiated~~ fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.10, with one required train 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	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately
	AND	
	A.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.~~3~~4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	
	A.2.~~4~~5 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One required DG inoperable.	B.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	B.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately
	AND	
	B.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	B.~~3~~4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	
	B.~~4~~5 Initiate action to restore required DG to OPERABLE status.	Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources Shutdown

LCO 3.8.5 The DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of ~~irradiated~~ fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------NOTE--------- Only applicable to 1800 amp-hour rated batteries. --- One or two required battery charger(s) on one train inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND A.2 Verify battery float current ≤ 1.50 amps. AND A.3.1 Restore required battery charger(s) to OPERABLE status. OR A.3.2.1 Provide ability to power the spare battery charger from a diesel-backed source. AND A.3.2.2 Restore required battery charger(s) to OPERABLE status.	2 hours Once per 12 hours 72 hours 72 hours 7 days

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more required DC electrical power subsystem(s) inoperable for reasons other than Conditions A or B.	D.1 Declare affected required feature(s) inoperable OR	Immediately
	D.2.1 Suspend CORE ALTERATIONS AND	Immediately
	D.2.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment. AND	Immediately
	D.2.3 Suspend movement of fuel assemblies in the fuel storage pool. AND	Immediately
	D.2.~~3~~4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration. AND	Immediately
	D.2.~~4~~5 Initiate action to restore required DC electrical power subsystem(s) to OPERABLE status.	Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters – Shutdown

LCO 3.8.8 Required inverters shall be OPERABLE to support the onsite Class 1E AC vital bus electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of ~~irradiated~~ fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required inverters inoperable.	A.1 Declare affected required feature(s) inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately
	AND	
	A.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.~~3~~4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.~~4~~5 Initiate action to restore required inverters to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct inverter voltage and alignment to required AC vital buses.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems - Shutdown

LCO 3.8.10 The necessary portion of AC, DC, and AC vital bus electrical power distribution systems shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6.
During movement of ~~irradiated~~ fuel assemblies within containment.
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC, DC, or AC vital bus electrical power distribution systems 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 within containment.	Immediately
	AND	
	A.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.~~3~~4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4~~5~~3 Initiate actions to restore required AC, DC, and AC vital bus electrical power distribution system(s) to OPERABLE status.	Immediately
	AND	
	A.2.5~~6~~4 Declare associated required shutdown cooling system(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution systems.	7 days

3.9 REFUELING OPERATIONS

3.9.3 Containment Penetrations

LCO 3.9.3 The containment penetrations shall be in the following status:

a. The equipment hatch closed and held in place by four bolts;

----------NOTE----------
The equipment hatch may be open if all of the following conditions are met:
1) The Containment Structure Equipment Hatch Shield Doors are capable of being closed within 30 minutes,
2) The plant is in Mode 6 with at least 23 feet of water above the reactor vessel flange,
3) A designated crew is available to close the Containment Structure Equipment Hatch Shield Doors,
4) Containment purge is in service, and
5) The reactor has been subcritical for at least 72 hours.
---

b. One door in each air lock closed;

----------NOTE----------
Both doors of the containment personnel airlock may be open provided:

a. one personnel airlock door is OPERABLE, and

b1. the plant is in MODE 6 with 23 feet of water above the fuel in the reactor vessel, or

b2. defueled configuration with fuel in containment (i.e., fuel in refueling machine or upender).
---

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere shall be either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. capable of being closed by an OPERABLE Containment Purge System.

APPLICABILITY: During CORE ALTERATIONS,
During movement of ~~irradiated~~ fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend CORE ALTERATIONS. AND A.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify each required containment penetration is in the required status.	7 days
SR 3.9.3.2	Verify each required containment purge and exhaust valve actuates to the isolation position on an actual or simulated actuation signal.	24 months

3.9 REFUELING OPERATIONS

3.9.6 Refueling Water Level

LCO 3.9.6 Refueling water level shall be maintained ≥ 23 ft above the top of reactor vessel flange.

---NOTE---
Water level may be lowered to a minimum of 23 feet above the top of the fuel for movement of four finger CEAs, coupling and uncoupling of CEA extension shafts or for verifying the coupling and uncoupling.

APPLICABILITY: During movement of fuel assemblies or CEAs within the reactor pressure vessel ~~when either the fuel assemblies being moved or the fuel assemblies seated within the reactor pressure vessel are irradiated,~~
During movement of ~~irradiated~~ fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Refueling water level not within limit.	A.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	The refueling water level shall be determined to be at least its minimum required depth.	24 hours

Attachment 3

Proposed Technical Specifications Markup Pages, Unit 3

3.3 INSTRUMENTATION

3.3.8 Containment Purge Isolation Signal (CPIS)

LCO 3.3.8 One CPIS channel shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
During CORE ALTERATIONS,
During movement of ~~irradiated~~ fuel assemblies within containment.

---NOTE---
Only required when the penetration is not isolated by appropriate closed and de-activated automatic valve(s), closed manual valve(s), or blind flange(s).

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. CPIS Actuation Logic, or one or more required channels of containment airborne radiation monitors inoperable in MODES 1, 2, 3, and 4.	A.1	Enter applicable Conditions and Required Actions for affected valves of LCO 3.6.3, "Containment Isolation Valves," made inoperable by CPIS instrumentation.	Immediately
B. Required Action and associated Completion Time not met in MODES 1, 2, 3, or 4.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more required channels of containment airborne radiation monitors inoperable in MODES 1, 2, 3, and 4.	C.1 Enter applicable conditions and required actions of LCO 3.4.15, "RCS Leak Detection."	Immediately
D. CPIS Manual Trip, Actuation Logic, or one or more required channels of containment airborne radiation monitors inoperable during CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies within containment.	----------NOTE---------- The provisions of LCO 3.0.3 are not applicable. ---------- D.1 Place and maintain containment purge supply and exhaust valves in closed position. OR D.2.1 Suspend CORE ALTERATIONS. AND D.2.2 Suspend movement of ~~irradiated~~ fuel assemblies in containment.	Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform a CHANNEL CHECK on required containment airborne radiation monitor channel.	12 hours

(continued)

3.3 INSTRUMENTATION

3.3.9 Control Room Isolation Signal (CRIS)

LCO 3.3.9 One CRIS channel shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of ~~irradiated~~ fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

----------NOTES----------
1. The provisions of LCO 3.0.3 are not applicable.
2. The provisions of LCO 3.0.4 are not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CRIS Manual Trip, Actuation Logic, or one required channel of control room airborne radiation monitors inoperable in MODES 1, 2, 3, or 4.	A.1 --------NOTE-------- Place Control Room Emergency Air Cleanup System (CREACUS) in isolation mode if automatic transfer to isolation mode inoperable. ---------- Place one CREACUS train in emergency mode.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. CRIS Manual Trip, Actuation Logic, or required control room airborne radiation monitors inoperable in MODE 5 or 6, or during movement of ~~irradiated~~ fuel assemblies within containment, or during the movement of fuel assemblies within the fuel storage pool.	B.1 --------NOTE-------- Place CREACUS in isolation mode if automatic transfer to isolation mode inoperable. ---------- Place one CREACUS train in emergency mode.	Immediately
	OR	
	B.2.1 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately
	AND	
	B.2.2 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	B.2.3 --------NOTE-------- Limited plant control operations are allowed provided the changes are accounted for in the calculated SDM. ---------- Suspend positive reactivity additions.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform a CHANNEL CHECK on the required control room airborne radiation monitor channel.	12 hours

(continued)

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

LCO 3.7.11 Two CREACUS trains shall be OPERABLE.

NOTE

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

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of ~~irradiated~~ fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

NOTES

1. The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration.

2. Each Unit shall enter applicable ACTIONS separately.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREACUS train inoperable for reasons other than Condition B.	A.1	Restore CREACUS train to OPERABLE status.	14 days
B. One or more CREACUS trains inoperable due to inoperable CRE boundary in Modes 1, 2, 3, or 4.	B.1	Initiate action to implement mitigating actions.	Immediately
	AND		
	B.2	Verify mitigating actions ensure CRE occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.	24 hours
	AND		
	B.3	Restore CRE boundary to OPERABLE status.	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, 3, or 4.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours
D. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of ~~irradiated~~ fuel assemblies within containment, or during the movement of fuel assemblies within the fuel storage pool.	D.1 Place OPERABLE CREACUS train in emergency radiation protection mode. OR D.2.1 Suspend CORE ALTERATIONS. AND D.2.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment. AND D.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately Immediately Immediately Immediately

ACTIONS

E. Two CREACUS trains inoperable in MODE 5 or 6, or during movement of ~~irradiated~~ fuel assemblies within containment, or during the movement of fuel assemblies in the fuel storage pool.	E.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	E.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately
	AND	
OR	E.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
One or more CREACUS trains inoperable due to inoperable CRE boundary in MODE 5 or 6, or during movement of ~~irradiated~~ fuel assemblies within containment, or during the movement of fuel assemblies in the fuel storage pool.		

(continued)

3.7 PLANT SYSTEMS

3.7.16 Fuel Storage Pool Water Level

LCO 3.7.16 The fuel storage pool water level shall be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: During movement of ~~irradiated~~ fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage pool water level not within limit.	A.1 --------NOTE-------- LCO 3.0.3 is not applicable. ---------- Suspend movement of ~~irradiated~~ fuel assemblies in fuel storage pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool water level is ≥ 23 ft above the top of irradiated fuel assemblies seated in the storage racks.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources – Shutdown

LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

a. One qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems Shutdown"; and

b. One diesel generator (DG) capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10.

APPLICABILITY: MODES 5 and 6,
During movement of ~~irradiated~~ fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.10, with one required train 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	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately
	AND	
	A.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.~~3~~4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	
	A.2.~~4~~5 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One required DG inoperable.	B.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	B.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately
	AND	
	B.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	B.~~3~~4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	
	B.~~4~~5 Initiate action to restore required DG to OPERABLE status.	Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources Shutdown

LCO 3.8.5 The DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of ~~irradiated~~ fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---NOTE--- Only applicable to 1800 amp-hour rated batteries. --- One or two required battery charger(s) on one train inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND A.2 Verify battery float current ≤ 1.50 amps. AND A.3.1 Restore required battery charger(s) to OPERABLE status. OR A.3.2.1 Provide ability to power the spare battery charger from a diesel-backed source. AND A.3.2.2 Restore required battery charger(s) to OPERABLE status.	2 hours Once per 12 hours 72 hours 72 hours 7 days

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more required DC electrical power subsystem(s) inoperable for reasons other than Condition A or B.	D.1 Declare affected required feature(s) inoperable.	Immediately
	OR	
	D.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	D.2.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately
	AND	Immediately
	D.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	
	AND	Immediately
	D.2.~~3~~4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	
	AND	Immediately
	D.2.~~4~~5 Initiate action to restore required DC electrical power subsystem(s) to OPERABLE status.	

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters – Shutdown

LCO 3.8.8 Required inverters shall be OPERABLE to support the onsite Class 1E AC vital bus electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of ~~irradiated~~ fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required inverters inoperable.	A.1 Declare affected required feature(s) inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately
	AND	
	A.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.~~3~~4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4~~5~~3 Initiate action to restore required inverters to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct inverter voltage and alignment to required AC vital buses.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems - Shutdown

LCO 3.8.10 The necessary portion of AC, DC, and AC vital bus electrical power distribution systems shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6.
During movement of ~~irradiated~~ fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC, DC, or AC vital bus electrical power distribution systems 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 within containment.	Immediately
	AND	
	A.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.~~3~~4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	
		(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.~~4~~3 Initiate actions to restore required AC, DC, and AC vital bus electrical power distribution system(s) to OPERABLE status.	Immediately
	AND	
	A.2.~~5~~6 Declare associated required shutdown cooling system(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution systems.	7 days

3.9 REFUELING OPERATIONS

3.9.3 Containment Penetrations

LCO 3.9.3 The containment penetrations shall be in the following status:

a. The equipment hatch closed and held in place by four bolts;

----------NOTE----------
The equipment hatch may be open if all of the following conditions are met:
1) The Containment Structure Equipment Hatch Shield Doors are capable of being closed within 30 minutes,
2) The plant is in Mode 6 with at least 23 feet of water above the reactor vessel flange,
3) A designated crew is available to close the Containment Structure Equipment Hatch Shield Doors,
4) Containment purge is in service, and
5) The reactor has been subcritical for at least 72 hours.
---

b. One door in each air lock closed;

----------NOTE----------
Both doors of the containment personnel airlock may be open provided:

a. one personnel airlock door is OPERABLE, and

b1. the plant is in MODE 6 with 23 feet of water above the fuel in the reactor vessel, or

b2. defueled configuration with fuel in containment (i.e., fuel in refueling machine or upender).
---

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere shall be either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. capable of being closed by an OPERABLE Containment Purge System.

APPLICABILITY: During CORE ALTERATIONS,
During movement of ~~irradiated~~ fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend CORE ALTERATIONS. AND	Immediately
	A.2 Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify each required containment penetration is in the required status.	7 days
SR 3.9.3.2	Verify each required containment purge and exhaust valve actuates to the isolation position on an actual or simulated actuation signal.	24 months

3.9 REFUELING OPERATIONS

3.9.6 Refueling Water Level

LCO 3.9.6 Refueling water level shall be maintained ≥ 23 ft above the top of reactor vessel flange.

---NOTE---
Water level may be lowered to a minimum of 23 feet above the top of the fuel for movement of four finger CEAs, coupling and uncoupling of CEA extension shafts or for verifying the coupling and uncoupling.

APPLICABILITY: During movement of fuel assemblies or CEAs within the reactor pressure vessel ~~when either the fuel assemblies being moved or the fuel assemblies seated within the reactor pressure vessel are irradiated,~~
During movement of ~~irradiated~~ fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Refueling water level not within limit.	A.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2	Suspend movement of ~~irradiated~~ fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	The refueling water level shall be determined to be at least its minimum required depth.	24 hours

Attachment 4

Proposed Technical Specification Pages, Unit 2

3.3 INSTRUMENTATION

3.3.8 Containment Purge Isolation Signal (CPIS)

LCO 3.3.8 One CPIS channel shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
During CORE ALTERATIONS,
During movement of fuel assemblies within containment.

----------NOTE----------
Only required when the penetration is not isolated by appropriate closed and de-activated automatic valve(s), closed manual valve(s), or blind flange(s).

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. CPIS Actuation Logic, or one or more required channels of containment airborne radiation monitors inoperable in MODES 1, 2, 3, and 4.	A.1	Enter applicable Conditions and Required Actions for affected valves of LCO 3.6.3, "Containment Isolation Valves," made inoperable by CPIS instrumentation.	Immediately
B. Required Action and associated Completion Time not met in MODES 1, 2, 3, or 4.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more required channels of containment airborne radiation monitors inoperable in MODES 1, 2, 3, and 4.	C.1 Enter applicable conditions and required actions of LCO 3.4.15, "RCS Leak Detection."	Immediately
D. CPIS Manual Trip, Actuation Logic, or one or more required channels of containment airborne radiation monitors inoperable during CORE ALTERATIONS or movement of fuel assemblies within containment.	----------NOTE---------- The provisions of LCO 3.0.3 are not applicable. ---------- D.1 Place and maintain containment purge supply and exhaust valves in closed position. OR D.2.1 Suspend CORE ALTERATIONS. AND D.2.2 Suspend movement of fuel assemblies in containment.	 Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform a CHANNEL CHECK on required containment airborne radiation monitor channel.	12 hours

(continued)

3.3 INSTRUMENTATION

3.3.9 Control Room Isolation Signal (CRIS)

LCO 3.3.9 One CRIS channel shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

----------NOTES----------
1. The provisions of LCO 3.0.3 are not applicable.
2. The provisions of LCO 3.0.4 are not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CRIS Manual Trip, Actuation Logic, or one required channel of control room airborne radiation monitors inoperable in MODES 1, 2, 3, or 4.	A.1 --------NOTE-------- Place Control Room Emergency Air Cleanup System (CREACUS) in isolation mode if automatic transfer to isolation mode inoperable. ---------- Place one CREACUS train in emergency mode.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. CRIS Manual Trip, Actuation Logic, or required control room airborne radiation monitors inoperable in MODE 5 or 6, or during movement of fuel assemblies within containment, or during the movement of fuel assemblies within the fuel storage pool.	B.1	--------NOTE-------- Place CREACUS in isolation mode if automatic transfer to isolation mode inoperable. ---------- Place one CREACUS train in emergency mode.	Immediately
	OR		
	B.2.1	Suspend movement of fuel assemblies within containment.	Immediately
	AND		
	B.2.2	Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND		
	B.2.3	--------NOTE-------- Limited plant control operations are allowed provided the changes are accounted for in the calculated SDM. ---------- Suspend positive reactivity additions.	Immediately

SURVEILLANCE REQUIREMENTS

ACTIONS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform a CHANNEL CHECK on the required control room airborne radiation monitor channel.	12 hours

(continued)

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

LCO 3.7.11 Two CREACUS trains shall be OPERABLE.

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

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS ---NOTES---
1. The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration.

2. Each Unit shall enter applicable ACTIONS separately.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREACUS train inoperable for reasons other than Condition B.	A.1	Restore CREACUS train to OPERABLE status.	14 days
B. One or more CREACUS trains inoperable due to inoperable CRE boundary in Modes 1, 2, 3, or 4.	B.1	Initiate action to implement mitigating actions.	Immediately
	AND		
	B.2	Verify mitigating actions ensure CRE occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.	24 hours
	AND		
	B.3	Restore CRE boundary to OPERABLE status.	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, 3, or 4.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours
D. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of fuel assemblies within containment, or during the movement of fuel assemblies within the fuel storage pool.	D.1 Place OPERABLE CREACUS train in emergency radiation protection mode. OR D.2.1 Suspend CORE ALTERATIONS. AND D.2.2 Suspend movement of fuel assemblies within containment. AND D.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately Immediately Immediately Immediately

ACTIONS (continued)

E. Two CREACUS trains inoperable in MODE 5 or 6, or during movement of fuel assemblies within containment, or during the movement of fuel assemblies in the fuel storage pool. OR One or more CREACUS trains inoperable due to an inoperable CRE boundary in MODE 5 or 6, or during movement of fuel assemblies within containment, or during the movement of fuel assemblies in the fuel storage pool.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E.2	Suspend movement of fuel assemblies within containment.	Immediately
	AND		
	E.3	Suspend movement of fuel assemblies in the fuel storage pool.	Immediately

(continued)

3.7 PLANT SYSTEMS

3.7.16 Fuel Storage Pool Water Level

LCO 3.7.16 The fuel storage pool water level shall be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage pool water level not within limit.	A.1 --------NOTE-------- LCO 3.0.3 is not applicable. ---------- Suspend movement of fuel assemblies in fuel storage pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool water level is ≥ 23 ft above the top of irradiated fuel assemblies seated in the storage racks.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources – Shutdown

LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

a. One qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems Shutdown"; and

b. One diesel generator (DG) capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10.

APPLICABILITY: MODES 5 and 6,
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.10, with one required train 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	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.2 Suspend movement of fuel assemblies within containment.	Immediately
	AND	
	A.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	
	A.2.5 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One required DG inoperable.	B.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	B.2	Suspend movement of fuel assemblies within containment.	Immediately
	AND		
	B.3	Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND		
	B.4	Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND		
	B.5	Initiate action to restore required DG to OPERABLE status.	Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources Shutdown

LCO 3.8.5 The DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

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

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. ---------NOTE--------- Only applicable to 1800 amp-hour rated batteries. ---------- One or two required battery charger(s) on one train inoperable.	A.1	Restore battery terminal voltage to greater than or equal to the minimum established float voltage.	2 hours
	AND		
	A.2	Verify battery float current ≤ 1.50 amps.	Once per 12 hours
	AND		
	A.3.1	Restore required battery charger(s) to OPERABLE status.	72 hours
	OR		
	A.3.2.1	Provide ability to power the spare battery charger from a diesel-backed source.	72 hours
	AND		
	A.3.2.2	Restore required battery charger(s) to OPERABLE status.	7 days

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more required DC electrical power subsystem(s) inoperable for reasons other than Condition A or B.	D.1 Declare affected required feature(s) inoperable. OR	Immediately
	D.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	D.2.2 Suspend movement of fuel assemblies within containment.	Immediately
	AND	
	D.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	D.2.4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	
	D.2.5 Initiate action to restore required DC electrical power subsystem(s) to OPERABLE status.	Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters – Shutdown

LCO 3.8.8 Required inverters shall be OPERABLE to support the onsite Class 1E AC vital bus electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required inverters inoperable.	A.1 Declare affected required feature(s) inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2.2 Suspend movement of fuel assemblies within containment.	Immediately
	AND	
	A.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.5 Initiate action to restore required inverters to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct inverter voltage and alignment to required AC vital buses.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems - Shutdown

LCO 3.8.10 The necessary portion of AC, DC, and AC vital bus electrical power distribution systems shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6.
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC, DC, or AC vital bus electrical power distribution systems 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 fuel assemblies within containment.	Immediately
	AND	
	A.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	
		(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.5 Initiate actions to restore required AC, DC, and AC vital bus electrical power distribution system(s) to OPERABLE status.	Immediately
	AND	
	A.2.6 Declare associated required shutdown cooling system(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution systems.	7 days

3.9 REFUELING OPERATIONS

3.9.3 Containment Penetrations

LCO 3.9.3 The containment penetrations shall be in the following status:

a. The equipment hatch closed and held in place by four bolts;

----------NOTE----------
The equipment hatch may be open if all of the following conditions are met:
1) The Containment Structure Equipment Hatch Shield Doors are capable of being closed within 30 minutes,
2) The plant is in Mode 6 with at least 23 feet of water above the reactor vessel flange,
3) A designated crew is available to close the Containment Structure Equipment Hatch Shield Doors,
4) Containment purge is in service, and
5) The reactor has been subcritical for at least 72 hours.
---

b. One door in each air lock closed;

----------NOTE----------
Both doors of the containment personnel airlock may be open provided:

a. one personnel airlock door is OPERABLE, and

b1. the plant is in MODE 6 with 23 feet of water above the fuel in the reactor vessel, or

b2. defueled configuration with fuel in containment (i.e., fuel in refueling machine or upender).
---

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere shall be either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. capable of being closed by an OPERABLE Containment Purge System.

APPLICABILITY: During CORE ALTERATIONS,
During movement of fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend CORE ALTERATIONS. AND A.2 Suspend movement of fuel assemblies within containment.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify each required containment penetration is in the required status.	7 days
SR 3.9.3.2	Verify each required containment purge and exhaust valve actuates to the isolation position on an actual or simulated actuation signal.	24 months

3.9 REFUELING OPERATIONS

3.9.6 Refueling Water Level

LCO 3.9.6 Refueling water level shall be maintained ≥ 23 ft above the top of reactor vessel flange.

---NOTE---
Water level may be lowered to a minimum of 23 feet above the top of the fuel for movement of four finger CEAs, coupling and uncoupling of CEA extension shafts or for verifying the coupling and uncoupling.

APPLICABILITY: During movement of fuel assemblies or CEAs within the reactor pressure vessel,
During movement of fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Refueling water level not within limit.	A.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2 Suspend movement of fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	The refueling water level shall be determined to be at least its minimum required depth.	24 hours

Attachment 5

(Proposed Technical Specification Pages, Unit 3

3.3 INSTRUMENTATION

3.3.8 Containment Purge Isolation Signal (CPIS)

LCO 3.3.8 One CPIS channel shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
During CORE ALTERATIONS,
During movement of fuel assemblies within containment.

----------NOTE----------
Only required when the penetration is not isolated by appropriate closed and de-activated automatic valve(s), closed manual valve(s), or blind flange(s).

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. CPIS Actuation Logic, or one or more required channels of containment airborne radiation monitors inoperable in MODES 1, 2, 3, and 4.	A.1	Enter applicable Conditions and Required Actions for affected valves of LCO 3.6.3, "Containment Isolation Valves," made inoperable by CPIS instrumentation.	Immediately
B. Required Action and associated Completion Time not met in MODES 1, 2, 3, or 4.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more required channels of containment airborne radiation monitors inoperable in MODES 1, 2, 3, and 4.	C.1 Enter applicable conditions and required actions of LCO 3.4.15, "RCS Leak Detection."	Immediately
D. CPIS Manual Trip, Actuation Logic, or one or more required channels of containment airborne radiation monitors inoperable during CORE ALTERATIONS or movement of fuel assemblies within containment.	----------NOTE---------- The provisions of LCO 3.0.3 are not applicable. ---------- D.1 Place and maintain containment purge supply and exhaust valves in closed position. OR D.2.1 Suspend CORE ALTERATIONS. AND D.2.2 Suspend movement of fuel assemblies in containment.	Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform a CHANNEL CHECK on required containment airborne radiation monitor channel.	12 hours

(continued)

3.3 INSTRUMENTATION

3.3.9 Control Room Isolation Signal (CRIS)

LCO 3.3.9 One CRIS channel shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

----------NOTES----------
1. The provisions of LCO 3.0.3 are not applicable.
2. The provisions of LCO 3.0.4 are not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CRIS Manual Trip, Actuation Logic, or one required channel of control room airborne radiation monitors inoperable in MODES 1, 2, 3, or 4.	A.1 --------NOTE-------- Place Control Room Emergency Air Cleanup System (CREACUS) in isolation mode if automatic transfer to isolation mode inoperable. ---------- Place one CREACUS train in emergency mode.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. CRIS Manual Trip, Actuation Logic, or required control room airborne radiation monitors inoperable in MODE 5 or 6, or during movement of fuel assemblies within containment, or during the movement of fuel assemblies within the fuel storage pool.	B.1 --------NOTE-------- Place CREACUS in isolation mode if automatic transfer to isolation mode inoperable. ---------- Place one CREACUS train in emergency mode.	Immediately
	OR	
	B.2.1 Suspend movement of fuel assemblies within containment.	Immediately
	AND	
	B.2.2 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	B.2.3 --------NOTE-------- Limited plant control operations are allowed provided the changes are accounted for in the calculated SDM. ---------- Suspend positive reactivity additions.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform a CHANNEL CHECK on the required control room airborne radiation monitor channel.	12 hours

(continued)

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

LCO 3.7.11 Two CREACUS trains shall be OPERABLE.

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

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

----------NOTES----------
1. The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration.

2. Each Unit shall enter applicable ACTIONS separately.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREACUS train inoperable for reasons other than Condition B..	A.1	Restore CREACUS train to OPERABLE status.	14 days
B. One or more CREACUS trains inoperable due to inoperable CRE boundary in Modes 1, 2, 3, or 4.	B.1	Initiate action to implement mitigating actions.	Immediately
	AND		
	B.2	Verify mitigating actions ensure CRE occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.	24 hours
	AND		
	B.3	Restore CRE boundary to OPERABLE status.	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, 3, or 4.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Be in MODE 5.	36 hours
D. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of fuel assemblies within containment, or during the movement of fuel assemblies within the fuel storage pool.	D.1	Place OPERABLE CREACUS train in emergency radiation protection mode.	Immediately
	OR		
	D.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	D.2.2	Suspend movement of fuel assemblies within containment.	Immediately
	AND		
	D.2.3	Suspend movement of fuel assemblies in the fuel storage pool.	Immediately

ACTIONS

E. Two CREACUS trains inoperable in MODE 5 or 6, or during movement of fuel assemblies within containment, or during the movement of fuel assemblies in the fuel storage pool.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E.2	Suspend movement of fuel assemblies within containment.	Immediately
OR	AND		
One or more CREACUS trains inoperable due to inoperable CRE boundary in MODE 5 or 6, or during movement of fuel assemblies within containment, or during the movement of fuel assemblies in the fuel storage pool.	E.3	Suspend movement of fuel assemblies in the fuel storage pool.	Immediately

(continued)

3.7 PLANT SYSTEMS

3.7.16 Fuel Storage Pool Water Level

LCO 3.7.16 The fuel storage pool water level shall be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage pool water level not within limit.	A.1 --------NOTE-------- LCO 3.0.3 is not applicable. ---------- Suspend movement of fuel assemblies in fuel storage pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool water level is ≥ 23 ft above the top of irradiated fuel assemblies seated in the storage racks.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources – Shutdown

LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

a. One qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems Shutdown"; and

b. One diesel generator (DG) capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10.

APPLICABILITY: MODES 5 and 6,
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.10, with one required train 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	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.2 Suspend movement of fuel assemblies within containment.	Immediately
	AND	
	A.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	
	A.2.5 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One required DG inoperable.	B.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	B.2	Suspend movement of fuel assemblies within containment.	Immediately
	AND		
	B.3	Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND		
	B.4	Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND		
	B.5	Initiate action to restore required DG to OPERABLE status.	Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources Shutdown

LCO 3.8.5 The DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

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

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. ---NOTE--- Only applicable to 1800 amp-hour rated batteries. --- One or two required battery charger(s) on one train inoperable.	A.1	Restore battery terminal voltage to greater than or equal to the minimum established float voltage.	2 hours
	AND		
	A.2	Verify battery float current $\leq$ 1.50 amps.	Once per 12 hours
	AND		
	A.3.1	Restore required battery charger(s) to OPERABLE status.	72 hours
	OR		
	A.3.2.1	Provide ability to power the spare battery charger from a diesel-backed source.	72 hours
		AND	
	A.3.2.2	Restore required battery charger(s) to OPERABLE status.	7 days

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more required DC electrical power subsystem(s) inoperable for reasons other than Condition A or B.	D.1 Declare affected required feature(s) inoperable. OR	Immediately
	D.2.1 Suspend CORE ALTERATIONS. AND	Immediately
	D.2.2 Suspend movement of fuel assemblies within containment. AND	Immediately
	D.2.3 Suspend movement of fuel assemblies in the fuel storage pool. AND	Immediately
	D.2.4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration. AND	Immediately
	D.2.5 Initiate action to restore required DC electrical power subsystem(s) to OPERABLE status.	Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters – Shutdown

LCO 3.8.8 Required inverters shall be OPERABLE to support the onsite Class 1E AC vital bus electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required inverters inoperable.	A.1 Declare affected required feature(s) inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2.2 Suspend movement of fuel assemblies within containment.	Immediately
	AND	
	A.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.5 Initiate action to restore required inverters to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct inverter voltage and alignment to required AC vital buses.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems - Shutdown

LCO 3.8.10 The necessary portion of AC, DC, and AC vital bus electrical power distribution systems shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6.
During movement of fuel assemblies within containment,
During movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC, DC, or AC vital bus electrical power distribution systems 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 fuel assemblies within containment.	Immediately
	AND	
	A.2.3 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.4 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	
		(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.5 Initiate actions to restore required AC, DC, and AC vital bus electrical power distribution system(s) to OPERABLE status.	Immediately
	AND	
	A.2.6 Declare associated required shutdown cooling system(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution systems.	7 days

3.9 REFUELING OPERATIONS

3.9.3 Containment Penetrations

LCO 3.9.3 The containment penetrations shall be in the following status:

a. The equipment hatch closed and held in place by four bolts;

---NOTE---
The equipment hatch may be open if all of the following conditions are met:
1) The Containment Structure Equipment Hatch Shield Doors are capable of being closed within 30 minutes,
2) The plant is in Mode 6 with at least 23 feet of water above the reactor vessel flange,
3) A designated crew is available to close the Containment Structure Equipment Hatch Shield Doors,
4) Containment purge is in service, and
5) The reactor has been subcritical for at least 72 hours.
---

b. One door in each air lock closed;

---NOTE---
Both doors of the containment personnel airlock may be open provided:

a. one personnel airlock door is OPERABLE, and

b1. the plant is in MODE 6 with 23 feet of water above the fuel in the reactor vessel, or

b2. defueled configuration with fuel in containment (i.e., fuel in refueling machine or upender).
---

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere shall be either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. capable of being closed by an OPERABLE Containment Purge System.

APPLICABILITY: During CORE ALTERATIONS,
During movement of fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend CORE ALTERATIONS. AND	Immediately
	A.2 Suspend movement of fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify each required containment penetration is in the required status.	7 days
SR 3.9.3.2	Verify each required containment purge and exhaust valve actuates to the isolation position on an actual or simulated actuation signal.	24 months

3.9 REFUELING OPERATIONS

3.9.6 Refueling Water Level

LCO 3.9.6 Refueling water level shall be maintained ≥ 23 ft above the top of reactor vessel flange.

---NOTE---
Water level may be lowered to a minimum of 23 feet above the top of the fuel for movement of four finger CEAs, coupling and uncoupling of CEA extension shafts or for verifying the coupling and uncoupling.

APPLICABILITY: During movement of fuel assemblies or CEAs within the reactor pressure vessel,
During movement of fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Refueling water level not within limit.	A.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2 Suspend movement of fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	The refueling water level shall be determined to be at least its minimum required depth.	24 hours

Attachment 6

Proposed Technical Specifications Bases Markup Pages, Unit 2

(For Information Only)

B 3.3 INSTRUMENTATION

B 3.3.8 Containment Purge Isolation Signal (CPIS)

BASES

BACKGROUND

This LCO encompasses the CPIS, which is a plant specific instrumentation channel that performs an actuation function required for plant protection but is not otherwise included in LCO 3.3.6, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip," or LCO 3.3.7, "Diesel Generator (DG) – Undervoltage Start."

A CPIS radiation monitor will generate a train related containment purge isolation signal (CPIS) upon detection of high gaseous radiation in containment. This signal in turn initiates a close signal to all same train containment purge valves, both main and minipurge.

The CPIS includes two independent, redundant logic subsystems, including actuation trains. Each train employs one gaseous sensor.

If either one of the corresponding sensors exceeds the bistable trip setpoint, the CPIS train will be actuated.

Each train actuates a separate series valve in the containment purge supply and return lines. Either train controls sufficient equipment to perform the isolation function. Minipurge valves are also isolated automatically on a Safety Injection Actuation Signal (SIAS) and Containment Isolation Actuation Signal (CIAS) in Modes 1-3.

Trip Setpoints

The trip setpoint is set sufficiently high to prevent spurious alarms/trips yet sufficiently low to assure an alarm/trip should an inadvertent release occur. Compliance with this requirement provides suitable confirmation that the monitors are capable of performing their intended function.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The containment airborne radiation monitors will generate an isolation signal for the containment purge in the event of a LOCA. However, containment isolation is expected to occur on either a safety injection actuation system signal or a containment isolation actuation system signal prior to initiation on a CPIS signal on high radiation in containment. In addition, the calculations show that, following a fuel handling accident in containment due to the response time of the containment airborne radiation monitors there will be some release of radioactivity to the environment prior to isolation of the purge by the CPIS.

In order to calculate the off-site doses resulting from such a release, it was conservatively assumed that all of the airborne radioactivity resulting from a fuel handling accident in containment was released to the environment (i.e., the containment purge was not isolated following a fuel handling accident). The analysis showed that the 0-2 hour site boundary (exclusion area boundary [EAB]) thyroid dose and the 0-2 hour site boundary whole body (WB) dose would be below the Standard Review Plan (SRP) 15.7.4 limits of 75 rem thyroid and 6 rem WB (these SRP limits are based on 25 percent of the 10 CFR 100 limits). |

General Design Criteria (GDC) 19 specifies that adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem WB, or its equivalent to any part of the body, for the duration of the accident. SRP 6.4 defines the dose-equivalent to the thyroid as 30 rem. The analysis demonstrated that the dose values are below those specified in GDC 19 as delineated by SRP 6.4.

(continued)

BASES (continued)

LCO

LCO 3.3.8 requires one CPIS channel to be OPERABLE. The required channel consists of gaseous radiation monitors; Actuation Logic; and Manual Trip.

The Bases for the LCO on CPIS are discussed below for each Function:

a. Manual Trip

The LCO on Manual Trip backs up the automatic trip and ensures operators have the capability to rapidly initiate the CPIS Function if any parameter is trending toward its setpoint. One manual channel of CPIS is required in MODES 1, 2, 3, and 4, since the CPIS is redundant with the CIAS and SIAS. One manual channel of CPIS is required during CORE ALTERATIONS and movement of ~~irradiated~~ fuel assemblies, since there are additional means of closing the containment purge valves in the event of a channel failure.

b. Gaseous Airborne Radiation

The monitor detects in containment gaseous airborne radiation and provides an alarm and trip function upon reaching the setpoint value. The trip function opens a contact in the actuation logic. There are two monitors with input into redundant actuation trains.

c. Actuation Logic

Actuation logic provides close signals to both mini and main train related containment purge valves.

APPLICABILITY

In MODES 1, 2, 3, and 4, the minipurge valves may be open. In these MODES, it is necessary to ensure the valves will shut in the event of a primary leak in containment whenever any of the containment purge valves are open.

With the purge valves open during CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies (i.e., irradiated fuel assemblies, non-irradiated fuel assemblies, and the dummy fuel assembly) within containment, a fuel handling accident would require CPIS on high radiation in containment.

(continued)

BASES (continued)

APPLICABILITY (Continued)

The APPLICABILITY is modified by a Note, which states that the CPIS Specification is only required when the penetration is not isolated by appropriate closed and de-activated automatic valve(s), closed manual valve(s), or blind flange(s).

ACTIONS

A CPIS channel is inoperable when it does not satisfy the OPERABILITY criteria for the channel's function. The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the plant specific setpoint analysis. Typically, the drift is not large and would result in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it within specification. If the trip setpoint is not consistent with the value specified in the Surveillance Requirement SR 3.3.8.2, the channel must be declared inoperable immediately, and the appropriate Conditions must be entered.

In the event a channel's trip setpoint is found nonconservative with respect to the value specified in the Surveillance Requirement SR 3.3.8.2, or the sensor, instrument loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that channel are required to be declared inoperable and the LCO Condition entered for the particular protective function affected.

A.1

Condition A applies to the failure of CPIS, Actuation Logic, and gaseous radiation monitors. The Required Action is to enter the applicable Conditions and Required Actions for affected valves of LCO 3.6.3, "Containment Isolation Valves." The Completion Time accounts for the condition that the capability to isolate containment on valid containment high radiation or manual signals is degraded during power operation or shutdown modes.

(continued)

BASES (continued)

ACTIONS (continued)

B.1 and B.2

Condition B applies when the Required Action and associated Completion Time of Condition A are not met in MODE 1, 2, 3, or 4. If Required Action A cannot be met 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 6 hours and to MODE 5 within 36 hours.

C.1

Condition C applies when one or more required channels of gaseous airborne radiation monitors are inoperable. The appropriate action is to enter LCO 3.4.15.

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

Condition D applies to the same conditions as are described in Condition A; however, the applicability is during CORE ALTERATIONS or during the movement of ~~irradiated~~ fuel assemblies within containment. Required Action D.1 is to place the containment purge and exhaust isolation valves in the closed position. The Required Action immediately performs the isolation function of the CPIS. Required Actions D.2.1 and D.2.2 may be performed in lieu of Required Action D.1. Required Action D.2.1 requires the suspension of CORE ALTERATIONS and Required Action D.2.2 requires suspension of movement of ~~irradiated~~ fuel in containment immediately. The Completion Time accounts for the fact that the automatic capability to isolate containment on valid containment high radiation signals is degraded during conditions in which a fuel handling accident is possible and CPIS provides the only automatic mitigation of radiation release.

SURVEILLANCE REQUIREMENTS

SR 3.3.8.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred on the required gaseous airborne radiation monitor channels used in the CPIS. A CHANNEL CHECK is a comparison of the

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.8.1 (continued)

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 two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

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 match criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit.

The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Thus, performance of the CHANNEL CHECK guarantees that undetected overt channel failure is limited to 12 hours. Since the probability of two random failures in redundant channels in any 12 hour period is low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.

SR 3.3.8.2

A CHANNEL FUNCTIONAL TEST is performed on the required containment gaseous airborne radiation monitoring channel to ensure the entire channel will perform its intended function. Setpoints must be found as specified in SR 3.3.8.2 and left consistent with the assumptions of the setpoint analysis. The Frequency of 92 days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 92 day Frequency is a rare event.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.3.8.3

Proper operation of the individual initiation relays is verified by actuating these relays during the CHANNEL FUNCTIONAL TEST of the Actuation Logic every 24 months. This will actuate the Function, operating all associated equipment. Proper operation of the equipment actuated by each train is thus verified. The Frequency of 24 months is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function during any 24 month interval is a rare event. A Note to the SR indicates that this Surveillance includes verification of operation for each initiation relay.

SR 3.3.8.4

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. Measurement error determination, setpoint error determination, and calibration adjustment must be performed consistent with the plant specific setpoint analysis. The channel shall be left calibrated consistent with the assumptions of the current setpoint analysis.

The 24 month 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.

SR 3.3.8.5

This Surveillance ensures that the train actuation response times are less than or equal to the maximum times assumed in the analyses. The 24 month Frequency is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences. Testing of the final actuating devices, which make up the bulk of the response time, is included in the Surveillance.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.3.8.6

Every 24 months, a CHANNEL FUNCTIONAL TEST is performed on the CPIS Manual Trip channel.

This test verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing manual actuation of the Function. The 24 month 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 these components usually pass the Surveillance when performed at a Frequency of once every 24 months.

REFERENCES

1. SONGS Units 2 and 3 UFSAR, Chapter 15.

2. 10 CFR 100.

BASES (continued)

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BASES (continued)

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B 3.3 INSTRUMENTATION

B 3.3.9 Control Room Isolation Signal (CRIS)

BASES

BACKGROUND

This LCO encompasses CRIS actuation, which is a plant specific instrumentation channel that performs an actuation function required for plant protection but is not otherwise included in LCO 3.3.6, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip," or LCO 3.3.7, "Diesel Generator (DG) - Loss of Voltage Start (LOVS)." This is a non-Nuclear Steam Supply System ESFAS Function that, because of differences in purpose, design, and operating requirements, is not included in LCO 3.3.6 and LCO 3.3.7.

The CRIS terminates the normal supply of outside air to the control room and initiates actuation of the Control Room Emergency Air Cleanup System (CREACUS) to minimize operator radiation exposure. The CRIS includes two independent, redundant trains. Each train consists of a gaseous radiation monitor, manual trip function and actuation logic. If the bistable monitoring either sensor indicates an unsafe condition, that train will be actuated (one-out-of-two logic). Each train related actuation signal operates the same train isolation equipment. Actuating either train will perform the intended function. Control room isolation also occurs on a Safety Injection Actuation Signal (SIAS) in MODES 1, 2, and 3.

Trip Setpoint

Accidents crediting control room isolation from the CRIS radiation monitor(s) have been evaluated with the setpoint specified in the Surveillance Requirement. The resulting dose to the control room operators is within the 10CFR50 Appendix A General Design Criteria 19 limits.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The CRIS, in conjunction with the Control Room Emergency Air Cleanup System (CREACUS), maintains the control room atmosphere within conditions suitable for prolonged occupancy throughout the duration of any one of the accidents discussed in Reference 1. The radiation exposure of control room personnel, through the duration of any one of the postulated accidents discussed in "Accident Analysis," SONGS Units 2 and 3 UFSAR, Chapter 15 (Ref. 1), does not exceed the limits set by 10 CFR 50, Appendix A, GDC 19 (Ref. 3).

LCO

LCO 3.3.9 requires one channel of CRIS to be OPERABLE. The required channel consists of Actuation Logic, Manual Trip, and gaseous radiation monitors. The specified value for the setpoint of the CRIS is listed in the SR.

The Bases for the LCO on the CRIS are discussed below for each Function:

a. Manual Trip

The LCO on Manual Trip backs up the automatic trips and ensures operators have the capability to rapidly initiate the CRIS Function if any parameter is trending toward its setpoint. One channel must be OPERABLE. This considers that the Manual Trip capability is a backup and that other means are available to actuate the redundant train if required, including manual SIAS.

b. Airborne Radiation

One channel of Airborne Radiation detection in the required train is required to be OPERABLE to ensure the control room isolates on high gaseous concentration.

c. Actuation Logic

One train of Actuation Logic must be OPERABLE, since there are alternate means available to actuate the redundant train, including SIAS.

(continued)

BASES (continued)

APPLICABILITY The CRIS Functions must be OPERABLE in MODES 1, 2, 3, 4, 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies in containment, and during the movement of fuel assemblies in the spent fuel pool, to ensure a habitable environment for the control room operators.

The term fuel assembly includes irradiated fuel, non-irradiated fuel, and the dummy fuel assembly.

ACTIONS A CRIS channel is inoperable when it does not satisfy the OPERABILITY criteria for the channel's function. The most common cause of channel inoperability is outright failure or drift of the bistable or process module. Typically, the drift is not large and would result in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it within specification. If the trip setpoint is not within the specified value, the channel is inoperable and the appropriate Conditions must be entered. The provisions of LCO's 3.0.3 and 3.0.4 are not applicable to this specification, as indicated by the two NOTES.

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

Conditions A and B have been modified by a Note, which specifies that CREACUS be placed manually in the isolation mode if the automatic transfer to the isolation mode is inoperable.

Conditions A and B are applicable to manual and automatic actuation of the CREACUS by CRIS. Condition A applies to the failure of the CRIS Manual Trip, Actuation Logic, and required gaseous radiation monitor channels in MODE 1, 2, 3, or 4. Entry into this Condition requires action to either restore the failed channel(s) or manually perform the CRIS safety function (Required Action A.1). The Completion Time of 1 hour is sufficient to complete the Required Actions and accounts for the fact that CRIS supplements control room isolation by other Functions in MODES 1, 2, 3, and 4.

(continued)

BASES (continued)

ACTIONS (continued)

Condition B applies to the failure of CRIS Manual Trip, Actuation Logic, ~~and~~ or required gaseous radiation monitor channels in Mode 5 or 6, or ~~when moving~~ during movement of ~~irradiated~~ fuel assemblies in containment and in the fuel storage pool. The Required Actions are immediately taken to place one OPERABLE CREACUS train in the emergency mode, or to suspend positive reactivity additions, and suspend movement of ~~irradiated~~ fuel assemblies in containment and in the fuel storage pool. The Completion Time recognizes the fact that the radiation signals are the only Functions available to initiate control room isolation in the event of a fuel handling accident.

Required Action B.2.2 is modified by a note to indicate that normal plant control operations that individually add limited positive reactivity (e.g., temperature or boron fluctuations associated with RCS inventory management or temperature control) are not precluded by this Action, provided they are accounted for in the calculated SDM.

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is 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 two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

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 match criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit.

The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Thus, performance of the CHANNEL CHECK guarantees that undetected overt channel failure is limited to 12 hours. Since the probability of two random failures in redundant channels in any 12 hour period is low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1 (continued)

supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.

SR 3.3.9.2

A CHANNEL FUNCTIONAL TEST is performed on the required control room radiation monitoring channel to ensure the entire channel will perform its intended function. As found and as left setpoints are recorded.

The Frequency of 92 days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 92 day interval is a rare event.

SR 3.3.9.3

Proper operation of the individual initiation relays is verified by de-energizing these relays during the CHANNEL FUNCTIONAL TEST of the Actuation Logic every 18 months. This will actuate the Function, operating all associated equipment. Proper operation of the equipment actuated by each train is thus verified.

The Frequency of 18 months is based on plant operating experience with regard to channel OPERABILITY, which demonstrates that failure of more than one channel of a given Function in any 18 month interval is a rare event.

A Note indicates this Surveillance includes verification of operation for each initiation relay.

SR 3.3.9.4

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Frequency of an 18 month calibration interval is based on experience with the magnitude of equipment drift in this period.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.9.5

Every 18 months, a CHANNEL FUNCTIONAL TEST is performed on the manual CRIS actuation circuitry.

This test verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing Manual Trip of the function. The 18 month 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 these components usually pass the Surveillance when performed at a Frequency of once every 18 months.

SR 3.3.9.6

This Surveillance ensures that the train actuation response times are less than or equal to the maximum times assumed in the analyses. A time limit to isolate the control room is needed to ensure compliance with 10 CFR 50 Appendix A General Design Criterion 19. The 18 month frequency is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences. The response time is tested from the module input; i.e., the radiation detector response is not measured. Testing of the final actuating devices is included in the Surveillance. Response time testing acceptance criteria are included in Reference 4.

REFERENCES

1. SONGS Units 2 and 3 UFSAR, Chapter 15.
2. SCE Calculation A-92-NF-003.
3. 10 CFR 50, Appendix A, GDC 19.
4. Licensee Controlled Specification 3.3.100, "RPS/ESFAS Response Times."

BASES (continued)

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B 3.7 PLANT SYSTEMS

B 3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

BASES

BACKGROUND

The CREACUS provides a protected environment from which occupants can control the plant following an uncontrolled release of radioactivity, hazardous chemicals, or smoke.

The CREACUS consists of two independent, redundant trains that recirculate and filter air in the control room envelope (CRE) and a CRE boundary that limits the inleakage of unfiltered air. Each CREACUS train consists of emergency air conditioning unit, emergency ventilation air supply unit, emergency isolation dampers, and cooling coils and two cabinet coolers per Unit. Each emergency air conditioning unit includes a prefilter, a high efficiency particulate air (HEPA) filter, an activated carbon adsorber section for removal of gaseous activity (principally iodines), and a fan. A second bank of HEPA filters follows the adsorber section to collect carbon fines. Each emergency ventilation air supply unit includes prefilter, HEPA filter, carbon adsorber and fan. Ductwork, motor-operated dampers, doors, barriers, and instrumentation also form part of the system. Air and motor-operated dampers are provided for air volume control and system isolation purposes.

The CRE is the area within the confines of the CRE boundary that contains the spaces that control room occupants inhabit to control the unit during normal and accident conditions. This area encompasses the control room, and may encompass other non-critical areas to which frequent personnel access or continuous occupancy is not necessary in the event of an accident. The CRE is protected during normal operation, natural events, and accident conditions. The CRE boundary is the combination of walls, floor, roof, ducting, doors, penetrations and equipment that physically form the CRE. The OPERABILITY of the CRE boundary must be maintained to ensure that the inleakage of unfiltered air into the CRE will not exceed the inleakage assumed in the licensing basis analyses of design basis accident (DBA) consequences to CRE occupants. The CRE and its boundary are defined in the Control Room Envelope Habitability Program.

(continued)

BASES (continued)

BACKGROUND (continued)

Upon receipt of the actuating signal, normal air supply to the CRE is isolated, and the stream of ventilation air is recirculated through the system's filter trains. The prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 15 minutes per month verifies proper system operability.

There are two CREACUS operational modes. Emergency mode is an operational mode when the control room is isolated to protect operational personnel from radioactive exposure through the duration of any one of the postulated limiting faults discussed in Chapter 15 UFSAR (Ref. 2). Isolation mode is an operational mode when the CRE is isolated to protect operational personnel from toxic gasses and smoke.

Actuation of the CREACUS places the system into either of two separate states of operation, depending on the initiation signal. Actuation of the system to either the emergency mode or isolation mode of CREACUS operation closes the unfiltered-outside-air intake and unfiltered exhaust dampers, and aligns the system for recirculation of air within the CRE through the redundant trains of HEPA and charcoal filters.

The emergency mode also initiates pressurization of the CRE. Outside air is added to the air being recirculated from the CRE. Pressurization of the CRE minimizes infiltration of unfiltered air through the CRE boundary from all the surrounding areas adjacent to the CRE boundary.

The CRE supply and the outside air supply of the normal control room HVAC are monitored by radiation and toxic-gas detectors respectively. One detector output above the setpoint will cause actuation of the emergency mode or isolation mode as required. The actions of the isolation mode are more restrictive, and will override the actions of the emergency mode of operation. However, toxic gas and radiation events are not considered to occur concurrently.

(continued)

BASES (continued)

BACKGROUND (continued)

Redundant recirculation trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally-open isolation dampers are arranged in series pairs so that one damper's failure to shut will not result in a breach of isolation. The CREACUS is designed in accordance with Seismic Category I requirements.

The CREACUS is designed to maintain a habitable environment in the CRE for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5-rem total effective dose equivalent (TEDE).

APPLICABLE SAFETY ANALYSES

The CREACUS components are arranged in redundant, safety related ventilation trains. The location of components and ducting within the CRE ensures an adequate supply of filtered air to all areas requiring access.

The CREACUS provides airborne radiological protection for the CRE occupants, as demonstrated by the CRE occupant dose analyses for the most limiting design basis loss of coolant accident fission product release presented in the UFSAR, Chapter 15 (Ref. 2).

Dose calculations, as specified in Unit 2/3 UFSAR Chapter 15 (Reference 2), only take credit for the HEPA filters and charcoal adsorbers of the emergency recirculation air conditioning unit. The emergency ventilation supply unit is designed to contribute to the pressurization of the control room to minimize unfiltered inleakage as indicated in Unit 2/3 UFSAR.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES (continued)

The CREACUS provides protection from smoke and hazardous chemicals to the CRE occupants. The analysis of hazardous chemical releases demonstrates that the toxicity limits are not exceeded in the CRE following a hazardous chemical release (Ref. 3). The evaluation of a smoke challenge demonstrates that it will not result in the inability of the CRE occupants to control the reactor either from the control room or from the remote shutdown panels (Ref. 4).

The worst case single active failure of a component of the CREACUS, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

The CREACUS satisfies Criterion 3 of the NRC Policy Statement.

LCO

Two independent and redundant trains of the CREACUS are required to be OPERABLE to ensure that at least one is available if a single active failure disables the other train. Total system failure, such as from a loss of both ventilation trains or from an inoperable CRE boundary, could result in exceeding a dose of 5 rem TEDE to the CRE occupants in the event of a large radioactive release.

Each CREACUS train is considered OPERABLE when the individual components necessary to limit CRE occupant exposure are OPERABLE. A CREACUS train is considered OPERABLE when the associated:

a. Fan is OPERABLE;

b. HEPA filters and charcoal adsorber are not excessively restricting flow, and are capable of performing their filtration functions; and

(continued)

BASES (continued)

LCO (continued)

c. Ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained. If an Emergency Isolation Damper is stuck open, the associated train of CREACUS may still be considered OPERABLE if the redundant damper in series with the inoperable damper is closed with power removed.

In order for the CREACUS trains to be considered OPERABLE, the CRE boundary must be maintained such that CRE occupant dose from a large radioactive release does not exceed the calculated dose in the licensing basis consequence analyses for DBAs, and that CRE occupants are protected from hazardous chemicals and smoke.

The LCO is modified by a Note allowing the CRE boundary to be opened intermittently under administrative controls. This note only applies to openings in the CRE boundary that can be rapidly restored to the design condition, such as doors, hatches, floor plugs, and access panels. For entry and exit through 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 CRE. This individual will have a method to rapidly close the opening and to restore the CRE boundary to a condition equivalent to the design condition when a need for CRE isolation is indicated.

(continued)

BASES (continued)

APPLICABILITY

In MODES 1, 2, 3, 4, 5, and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies in containment, and during movement of fuel assemblies in the fuel storage pool, the CREACUS must be OPERABLE to ensure that the CRE will remain habitable during and following a DBA.

The term fuel assembly includes irradiated fuel, non-irradiated fuel, and the dummy fuel assembly.

In MODES 5 and 6, the CREACUS is required to cope with the release from a rupture of a waste gas tank.

During movement of ~~irradiated~~ fuel assemblies, the CREACUS must be OPERABLE to cope with the release from a fuel handling accident involving ~~handling~~ irradiated fuel.

ACTIONS

ACTION statements are modified by two NOTES. NOTE 1 says: "The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration."

Specification 3.0.4 establishes that entry into an operational mode or other specified condition shall not be made unless the conditions of the LCO are met. Applicability statements "During movement of ~~irradiated~~ fuel assemblies in containment, and during movement of fuel assemblies in the fuel storage pool" ensures the OPERABILITY of both CREACUS trains prior to the start of movement of ~~irradiated~~ fuel assemblies.

NOTE 2 says: "Each Unit shall enter applicable ACTIONS separately." CREACUS is a shared system between Unit 2 and Unit 3. LCO doesn't address the operational situation when the Units are in different operational MODES. Without this NOTE it may not be clear what ACTIONS should be taken.

(continued)

BASES (continued)

ACTIONS (continued)

A.1

With one CREACUS train inoperable, for reasons other than an inoperable CRE boundary, action must be taken to restore OPERABLE status within 14 days. The 14 day AOT is based on a probabilistic risk assessment that does not require administrative controls to be implemented when a CREACUS train is taken out of service. In this Condition, the remaining OPERABLE CREACUS train is adequate to perform the CRE occupant protection function.

However, the overall reliability is reduced because a failure in the OPERABLE CREACUS train could result in loss of CREACUS function. The 14 day Completion Time is based on the low probability of a DBA occurring during this time period, and the ability of the remaining train to provide the required capability.

B.1, B.2 and B.3

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

(continued)

BASES (continued)

ACTIONS (continued)

During the period that the CRE boundary is considered inoperable, action must be initiated to implement mitigating actions to lessen the effect on CRE occupants from the potential hazards of a radiological or chemical event or a challenge from smoke. Actions must be taken within 24 hours to verify that in the event of a DBA, the mitigating actions will ensure that CRE occupant radiological exposures will not exceed the calculated dose of the licensing basis analyses of DBA consequences, and that CRE occupants are protected from hazardous chemicals and smoke. These mitigating actions (i.e., actions that are taken to offset the consequences of the inoperable CRE boundary) should be preplanned for implementation upon entry into the condition, regardless of whether entry is intentional or unintentional. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90 day Completion Time is reasonable based on the determination that the mitigating actions will ensure protection of CRE occupants within analyzed limits while limiting the probability that CRE occupants will have to implement protective measures that may adversely affect their ability to control the reactor and maintain it in a safe shutdown condition in the event of a DBA. In addition, the 90 day Completion Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the CRE boundary.

C.1 and C.2

In MODES 1, 2, 3, or 4, if the inoperable CREACUS or the CRE boundary cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes the accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

(continued)

BASES (continued)

ACTIONS (continued)

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

In MODE 5 or 6, or during movement of ~~irradiated~~ fuel assemblies within containment, or during the movement of fuel assemblies in the fuel storage pool, if Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE CREACUS train must be immediately placed in the emergency mode of operation. This action ensures that the remaining train is OPERABLE, that no failures preventing 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 could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel assemblies to a safe position.

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

When in MODE 5 or 6, or during movement of ~~irradiated~~ fuel assemblies within containment, or during the movement of fuel assemblies in the fuel storage pool, with two trains inoperable or with one or more CREACUS trains inoperable due to an inoperable CRE boundary, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

F.1

If both CREACUS trains are inoperable in MODE 1, 2, 3, or 4 for reasons other than an inoperable CRE boundary (i.e., Condition B), the CREACUS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

Standby systems should be checked periodically to ensure that they function properly. Since the environment and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system.

Cumulative operation of the system for at least 2 hours over a 31 day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filtes. The 2 hour time frame is based on a conservative engineering evaluation which calculated the time required to evaporate the moisture contained in the air trapped inside the CREACUS duct upstream of charcoal beds. The 31 day Frequency is based on the known reliability of the equipment, and the two train redundancy available.

SR 3.7.11.2

This SR verifies that the required CREACUS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREACUS filter tests are based on Regulatory Guide 1.52 (Ref. 5). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of theactivated charcoal (general use and following specific operations). Specific test Frequencies and additional information are discussed in detail in the VFTP.

The filtration efficiency only apply to the emergency recirculation air conditioning units E418 and E419. Therefore, testing for filtration efficiency is not required for the emergency ventilation supply units A206 and A207.

However, the specified air flow from the emergency ventilation units is required during the filtration efficiency testing of the emergency recirculation air conditioning units. Also, the air flow requirements which are specified in the VFTP apply to the emergency ventilation and emergency air conditioning units.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.11.3

This SR verifies that each CREACUS train starts and operates on an acutual or simulated actuation signal. The Frequency of 24 months is based on industry operating experience and is consistent with the typical refueling cycle.

SR 3.7.11.4

This SR verifies the OPERABILITY of the CRE boundary by testing for unfiltered air inleakage past the CRE boundary and into the CRE. The details of the testing are specified in the Control Room Envelope Habitability Program.

The CRE is considered habitable when the radiological dose to CRE occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem TEDE and the CRE occupants are protected from hazardous chemicals and smoke. This SR verifies that the unfiltered air inleakage into the CRE is no greater than the flow rate assumed in the licensing basis analyses of DBA consequences. When unfiltered air inleakage is greater than the assumed flow rate, Condition B must be entered. Required Action B.3 allows time to restore the CRE boundary to OPERABLE status provided mitigating actions can ensure that the CRE remains within the licensing basis habitability limits for the occupants following an accident. Compensatory measures are discussed in Regulatory Guide 1.196, Section C.2.7.3, (Ref. 6) which endorses, with exceptions, NEI 99-03, Section

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.11.4

8.4 and Appendix F (Ref. 7). These compensatory measures may also be used as mitigating actions as required by Required Action B.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 8). Options for restoring the CRE boundary to OPERABLE status include changing the licensing basis DBA consequence analysis, repairing the CRE boundary, or a combination of these actions. Depending upon the nature of the problem and the corrective action, a full scope inleakage test may not be necessary to establish that the CRE boundary has been restored to OPERABLE status.

REFERENCES

1. UFSAR, Section 9.4.

2. UFSAR, Chapter 15.

3. UFSAR, Section 6.4.

4. UFSAR, Section 9.5.

5. Regulatory Guide 1.52 (Rev. 2).

6. Regulatory Guide 1.196.

7. NEI 99-03, "Control Room Habitability Assessment," June 2001.

8. Letter from Eric J. Leeds (NRC) to James W. Davis (NEI) dated January 30, 2004, "NEI Draft White Paper, Use of Generic Letter 91-18 Process and Alternative Source Terms in the Context of Control Room Habitability." (ADAMS Accession No. ML040300694).

(continued)

B 3.7 PLANT SYSTEMS

B 3.7.16 Fuel Storage Pool Water Level

BASES

BACKGROUND

The minimum water level in the fuel storage pool meets the assumptions of iodine decontamination factors following a fuel handling accident. The specified water level shields and minimizes the general area dose when the storage racks are filled to their maximum capacity. The water also provides shielding during the movement of spent fuel.

A general description of the fuel storage pool design is given in the UFSAR, Section 9.1.2, Reference 1, and the Spent Fuel Pool Cooling and Cleanup System is given in the UFSAR, Section 9.1.3 (Ref. 2). The assumptions of the fuel handling accident are given in the UFSAR, Section 15.7.3.4 and 15.7.3.6 (Ref. 3 and Ref. 6).

APPLICABLE SAFETY ANALYSES

The minimum water level in the fuel storage pool meets the assumptions of the fuel handling accident described in Regulatory Guide 1.25 (Ref. 4). The resultant 2 hour thyroid dose to a person at the exclusion area boundary is a small fraction of the 10 CFR 100 (Ref. 5) limits.

According to Reference 4, there is 23 ft of water between the top of the damaged fuel bundle and the fuel pool surface for a fuel handling accident. With this 23 ft of water, the assumptions of Reference 4 can be used directly. In practice, this LCO preserves this assumption for the bulk of the fuel in the storage racks. In the case of a single bundle, dropped and lying horizontally on top of the spent fuel racks, there would be < 23 ft of water above the top of the bundle.

However, when the potential of a dropped fuel assembly exists (which is when fuel is being moved) a water level is maintained that would ensure that there would be >23 feet above the fuel assembly laying on top of the racks. This increased water level is required by LCO 3.9.6 when the fuel storage pool is connected to the refueling cavity and by station procedures whenever fuel is being moved.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES (continued)

The fuel storage pool water level satisfies Criterion 3 of the NRC Policy Statement.

LCO

The specified water level preserves the assumptions of the fuel handling accident analysis (Ref. 3). As such, it is the minimum required for fuel storage and movement within the fuel storage pool.

APPLICABILITY

This LCO applies during movement of ~~irradiated~~ fuel assemblies (i.e., irradiated fuel, non-irradiated fuel, and the dummy fuel assembly) in the fuel storage pool since the potential for a release of fission products exists.

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply.

When the initial conditions for an accident cannot be met, steps should be taken to preclude the accident from occurring. When the fuel storage pool water level is lower than the required level, the movement of ~~irradiated~~ fuel assemblies in the fuel storage pool is immediately suspended. This effectively precludes a spent fuel handling accident from occurring. This does not preclude moving a fuel assembly to a safe position.

If moving ~~irradiated~~ fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving ~~irradiated~~ fuel assemblies while in MODES 1, 2, 3, and 4, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of ~~irradiated~~ fuel assemblies is not sufficient reason to require a reactor shutdown.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.16.1

This SR verifies sufficient fuel storage pool water is available in the event of a fuel handling accident. The water level in the fuel storage pool must be checked periodically. The 7 day Frequency is appropriate because the volume in the pool is normally stable. Water level changes are controlled by unit procedures and are acceptable, based on operating experience.

During refueling operations, the level in the fuel storage pool is at equilibrium with that of the refueling canal, and the level in the refueling canal is checked daily in accordance with LCO 3.9.6, "Refueling Water Level." |

REFERENCES

1. UFSAR, Section 9.1.2.
2. UFSAR, Section 9.1.3.
3. UFSAR, Section 15.7.3.4. |
4. Regulatory Guide 1.25
5. 10 CFR 100.11.
6. UFSAR, Section 15.7.3.6 |

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 5 and 6 ensures that:

a. The unit 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 a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or 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, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in 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, 3, and 4, various deviations from the analysis assumptions and design requirements are allowed within the Required Actions. This allowance is in recognition that certain testing and maintenance activities

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES (continued)

must be conducted provided an acceptable level of risk is not exceeded. During MODES 5 and 6, performance of a significant number of required testing and maintenance activities is also required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO requirements are acceptable during shutdown modes based on:

a. The fact that time in an outage is limited. This is a risk prudent goal as well as a utility economic consideration.

b. Requiring appropriate compensatory measures for certain conditions. These may include administrative controls, reliance on systems that do not necessarily meet typical design requirements applied to systems credited in operating MODE analyses, or both.

c. Prudent utility consideration of the risk associated with multiple activities that could affect multiple systems.

d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

In the event of an accident during shutdown, this LCO ensures the capability to support systems necessary to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite diesel generator (DG) power.

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

LCO

One offsite circuit capable of supplying the onsite Class 1E power distribution subsystem(s) of LCO 3.8.10, "Distribution Systems – Shutdown," ensures that all required loads are powered from offsite power. An OPERABLE DG, associated with a distribution system train required to be OPERABLE by LCO 3.8.10, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite circuit. Together, OPERABILITY of the required offsite circuit and DG ensures the availability of

(continued)

BASES (continued)

LCO (continued)

sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

The qualified offsite circuit must be capable of maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the Engineered Safety Feature (ESF) bus(es). Qualified offsite circuits are those that are described in the UFSAR and are part of the licensing basis for the unit.

One source of offsite power (Offsite circuit #1) for each unit is normally provided through Reserve Auxiliary Transformers XR1 and XR2 for the specific unit. XR1 feeds one 4.16 KV ESF bus (Train A) A04 and XR2 feeds the other 4.16 KV ESF bus (Train B) A06 of the onsite Class 1E AC distribution system for each unit. The second source of offsite power (Offsite circuit #2) is provided by the other unit's Reserve Auxiliary Transformers XR1 and XR2 through the train oriented 4.16 KV ESF bus crossties between the two units. In addition, an alternate offsite source of power for each unit would be, with the unit's main generator isophase bus links removed, each unit's Auxiliary Transformer XU1.

The DG must be capable of starting, accelerating to rated speed and voltage, connecting to its respective ESF bus on detection of bus undervoltage, and accepting required loads. This sequence must be accomplished within 10 seconds. The DG must 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 ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot, DG in standby at ambient conditions, and DG operating in a parallel test mode.

Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY. Load sequencing is accomplished through the programmed time load sequence interval utilizing individual timing relays for each load in lieu of a single "automatic load sequencer."

(continued)

BASES (continued)

LCO (continued)

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

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies within containment and during the movement of fuel assemblies in the fuel storage pool provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;

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

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

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

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

The term fuel assembly includes irradiated fuel, non-irradiated fuel, and the dummy fuel assembly.

ACTIONS

A.1

An offsite circuit would be considered inoperable if it were not available to the required ESF train. Although one train is required by LCO 3.8.10 the remaining train with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and/or fuel movement. By the allowance of the option to declare inoperable the required features associated with the inoperable offsite circuit, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS.

(continued)

BASES (continued)

ACTIONS (continued)

A.2.1, A.2.2, A.2.3, A.2.4, A.2.5, B.1, B.2, B.3, B.4, and B.5

With the offsite circuit not available to the required train (Condition A), the option exists to declare all required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With the required DG inoperable (Condition B), the minimum required diversity of AC power sources is not available. It is, therefore, required to suspend CORE ALTERATIONS, suspend movement of ~~irradiated~~ fuel assemblies within containment, suspend movement of fuel assemblies in the fuel storage pool, and suspend operations involving positive reactivity additions that could result in loss of required SDM (Mode 5) or boron concentration (Mode 6). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability or 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 unit safety systems.

Notwithstanding performance of the conservative Required Actions, the unit is still without sufficient AC power sources to operate in a safe manner. Therefore, action must be initiated to restore the minimum required AC power sources and continue until the LCO requirements are restored.

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

(continued)

BASES (continued)

ACTIONS

A.2.1, A.2.2, A.2.3, A.2.4, A.2.5, B.1, B.2, B.3, B.4, and B.5 (continued)

Pursuant to LCO 3.0.6, the Distribution System's (LCO 3.8.10) ACTIONS are not entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A is entered with no AC power to one ESF bus, the ACTIONS for LCO 3.8.10 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite circuit, whether or not a train is de-energized. LCO 3.8.10 provides the appropriate restrictions for the situation involving a de-energized train.

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, 3, and 4. SR 3.8.1.17 is not required to be met because the required OPERABLE DG is not required to undergo periods of being synchronized to the offsite circuit. SR 3.8.1.20 is excepted because starting independence is not required with DG(s) that are not required to be OPERABLE.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DG from being paralleled with the offsite power network or otherwise rendered inoperable. With limited AC Sources available, a single event could unnecessarily compromise both the required circuit and the DG. The SRs listed in the Note are not required to be performed for the OPERABLE AC sources during Modes 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies within containment, and during movement of fuel assemblies in the storage pool. However, these AC sources are presumed to be able to meet these surveillances. If it is discovered (through analysis or unplanned events, for example) that the required AC sources could not meet these surveillances, then the equipment must be considered inoperable. Refer to the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

REFERENCES

1. UFSAR, Chapter 15.

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." When TS 3.8.5 applies, there are two exceptions to what is described in the Bases for LCO 3.8.4:

1. One or both train(s) of the DC subsystem buses may be cross-tied to an 1800 amp-hour rated battery. This alignment allows both subsystems to remain OPERABLE. There is no time limit to the duration DC subsystem buses may be cross-tied with the unit shutdown.

2. With same train DC buses cross connected, an OPERABLE charger or chargers with a combined rated capacity greater than or equal to 300 Amps is required. A "required battery charger" is one of the following:

- the "dedicated charger" aligned to its respective DC bus
- the "swing battery charger" aligned to the respective DC bus
- one "dedicated charger" aligned to cross-tied DC buses, or
- the "swing battery charger" aligned to cross-tied DC buses.

Note: It is acceptable to have the swing charger and one dedicated charger aligned to cross-connected buses.

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume that Engineered Safety Feature (ESF) systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation.

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

The OPERABILITY of the minimum DC electrical power sources during MODES 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies within containment, and during movement of fuel assemblies in the fuel storage pool ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

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 a fuel handling accident.

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

LCO

Each DC electrical power subsystem, consisting of one battery (cross connection allowed), the required battery charger, and the corresponding control equipment and interconnecting cabling supplying power to the associated bus, is required to be OPERABLE to support distribution systems required OPERABLE by LCO 3.8.10, "Distribution Systems – Shutdown." This ensures the availability of sufficient DC electrical power sources to maintain the unit in a safe shutdown condition and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

APPLICABILITY

The DC electrical power sources required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies within containment, and during movement of fuel assemblies in the fuel storage pool provide assurance that:

a. Required features to mitigate a fuel handling accident are available;

b. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

c. 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, 3, and 4 are covered in LCO 3.8.4.

The term fuel assembly includes irradiated fuel, non-irradiated fuel, and the dummy fuel assembly.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since ~~irradiated~~ fuel assembly movement can occur in MODE 1, 2, 3, or 4, 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 5 or 6, LCO 3.0.3 would not specify

(continued)

BASES

ACTIONS (continued)

any action. If moving ~~irradiated~~ fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3 or 4 would require the unit to be shutdown unnecessarily. Conditions A and B represent one train with one or two required battery chargers or associated control equipment or cabling inoperable (e.g., the battery voltage limit of SR 3.8.4.1 is not maintained). The ACTIONS provide a tiered response that focuses on returning the battery to the fully charged state and restoring the required charger(s) to OPERABLE status in a reasonable time period.

A.1, A.2, and A.3 (A.3.1 or A.3.2.1 and A.3.2.2)

Condition A is modified by a NOTE identifying that it is only applicable to 1800 amp-hour rated batteries.

Required Action A.1 requires that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage (? 129.0 V) within 2 hours. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. Restoring the battery terminal voltage to greater than or equal to minimum established float voltage provides good assurance that, within 12 hours, the battery will be restored to its fully charged condition (Required Action A.2) from any discharge that might have occurred due to the charger inoperability. A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus, there is good assurance of fully recharging the battery within 12 hours, avoiding a shutdown of refueling activities.

If established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 2 hours, and the charger is not operating in the current limiting mode, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit mode that is necessary during the recovery period following a battery discharge event that the DC system is designed for.

(continued)

BASES

ACTIONS

A.1, A.2, and A.3 (A.3.1 or A.3.2.1 and A.3.2.2) (continued)

The charger operating in the current limit mode in excess of 2 hours is an indication that the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be fully recharged within 12 hours (Required Action A.2).

Required Action A.2 requires that the battery float current be verified as less than or equal to 21.50 amps. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it is now fully capable to supply the maximum expected load requirement. The battery manufacturer certified that at 1.50 amps the battery is at least 98% charged. A 2% capacity margin (correction factor) has been used in the battery sizing calculation (Ref. 3) which ensures that the battery has sufficient capacity to meet the maximum expected load demand. If at the expiration of the initial 12 hour period the battery float current is not less than or equal to 1.50 amps this indicates there may be additional battery problems and the battery must be declared inoperable.

A digital multimeter of high accuracy in an average function mode is required to measure the steady state float charging current (Ref. 4). The multimeter must be capable of measuring the low magnitude of DC current (less than 1.50 amps) and filtering the induced AC noise from the connected inverter. A millivolt shunt located close to the battery terminal provides the battery float charging current signal.

Required Action A.3 (A.3.1 or A.3.2.1 and A.3.2.2) is applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used (e.g., balance of plant non-Class 1E spare battery charger).

Required Action A.3.1 limits the restoration time for the required battery charger to 72 hours if a non-1E charger with a non-1E power source is used. The restoration time for the battery charger can be extended to 7 days (required Action A.3.2.2) if the ability to power the spare battery charger from a diesel-backed source has been established within 72 hours (Required Action A.3.2.1). All preparations to accomplish the ability to power the spare battery charger must be complete within 72 hours. The purpose of this

(continued)

BASES

ACTIONS

A.1, A.2, and A.3 (A.3.1 or A.3.2.1 and A.3.2.2) (continued)

provision is to facilitate connection of the spare battery charger to a diesel-backed source in ≤ 4 hours if non-1E power is lost. The 4-hour charger connection time is required because 4 hours after the loss of non-1E power, the battery may not supply the minimum required voltage at the loads. The 7-day completion time reflects a reasonable time to effect restoration of the required battery charger to operable status.

B.1, B.2, and B.3 (B.3.1 or B.3.2.1 and B.3.2.2)

Condition B is modified by a NOTE identifying that it is only applicable to 1260 amp-hour rated batteries.

Required Action B.1 basis is the same as A.1.

Required Action B.2 requires that the battery float current be verified to be less than or equal to 0.75 amp. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it is now fully capable to supply the maximum expected load requirement. The battery manufacturer certified that at 0.75 amp the battery is at least 98% charged. A 2% capacity margin (correction factor) has been used in the battery sizing calculation (Ref. 3) which ensures that the battery has sufficient capacity to meet the maximum expected load demand. If at the expiration of the initial 12 hour period the battery float current is not less than or equal to 0.75 amp this indicates there may be additional battery problems and the battery must be declared inoperable.

A digital multimeter of high accuracy in an average function mode is required to measure the steady state float charging current (Ref. 4). The multimeter must be capable of measuring the low magnitude of DC current (less than 0.75 amp) and filtering the indicated AC noise from the connected inverter. A millivolt shunt located close to the battery terminal provides the battery float charging current signal.

Required Action B.3 (B.3.1 or B.3.2.1 and B.3.2.2) basis is the same as A.3 (A.3.1 or A.3.2.1 and A.3.2.2).

(continued)

BASES

ACTIONS (continued)

C.1

With the required DC electrical power subsystem battery charger or associated control equipment or cabling outside the allowances of the Required Actions for Condition A or B, sufficient capacity to supply the maximum expected load requirement is not assured and the associated DC battery must be declared inoperable immediately.

D.1, or D.2.1, D.2.2, D.2.3, D.2.4, and D.2.5

Condition D represents one DC electrical power subsystem inoperable for reasons other than Condition A or B including when a battery is inoperable (Condition C). The ACTIONS provide a tiered response allowing the option to declare required features inoperable immediately with the associated DC power source(s) inoperable.

If two trains are required per LCO 3.8.10, the remaining train with DC power available may be capable of supporting sufficient systems to allow continuation of CORE ALTERATIONS and fuel movement. By allowing the option to declare required features inoperable with the associated DC power source(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCO 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, and suspend movement of ~~irradiated~~ fuel assemblies within containment, and suspend movement of fuel assemblies in the fuel storage pool, and suspend operations involving positive reactivity additions). The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory, provided the required SDM is maintained.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize 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 unit safety systems.

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

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

SR 3.8.5.1 states that Surveillances required by SR 3.8.4.1 through SR 3.8.4.34 are applicable in these MODES. See the corresponding Bases for LCO 3.8.4 for a discussion of each SR.

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

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. SCE Calculation E4C-017.
4. Response to Request for Additional Information on Battery and DC Sources Upgrades dated November 14, 2008.

(continued)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.8 Inverters – Shutdown

BASES

BACKGROUND

A description of the inverters is provided in the Bases for LCO 3.8.7, "Inverters – Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safety Feature systems are OPERABLE. The DC to AC inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the Reactor Protective System and Engineered Safety Features Actuation System instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

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

The OPERABILITY of the minimum inverters to each AC vital bus during MODES 5 and 6 ensures that:

a. The unit 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 available to mitigate events postulated during shutdown, such as a fuel handling accident.

The inverters were previously identified as part of the distribution system and, as such, satisfy Criterion 3 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO

The required inverters ensure the availability of electrical power for the instrumentation for systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. The battery powered inverters provide uninterruptible supply of AC electrical power to the AC vital buses even if the 4.16 kV safety buses are de-energized. OPERABILITY of at least two of the four inverters and the associated vital buses is required. This ensures the availability of sufficient inverter 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).

APPLICABILITY

The inverters required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies within containment and during movement of fuel assemblies in the fuel storage pool provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;

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.

Inverter requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.7.

The term fuel assembly includes irradiated fuel, non-irradiated fuel, and the dummy fuel assembly.

ACTIONS

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

If two trains of 120 VAC Vital Buses are required by LCO 3.8.10, "Distribution Systems – Shutdown," the remaining OPERABLE inverters may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS, fuel movement, and operations with a potential for positive

(continued)

BASES (continued)

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

reactivity additions that could result in loss of required SDM (Mode 5) or boron concentration (Mode 6). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM. By the allowance of the option to declare required features inoperable with the associated inverter(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCOs' 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, and suspend movement of ~~irradiated~~ fuel assemblies within containment, and suspend movement of fuel assemblies in the fuel storage pool, and suspend operations involving positive reactivity additions).

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 inverters and to continue this action until restoration is accomplished in order to provide the necessary inverter power to the unit safety systems.

Notwithstanding performance of the above conservative Required Actions, the unit is still without sufficient AC vital power sources to operate in a safe manner. Therefore, action must be initiated to restore the minimum required AC vital power source and continue until the LCO requirements are restored.

(continued)

BASES (continued)

ACTIONS

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

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required inverters should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power or powered from a constant voltage source transformer.

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and AC vital buses energized from the inverter. The verification of proper voltage output ensures that the required power is readily available for the instrumentation connected to the AC vital buses. The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.

REFERENCES

1. UFSAR, Chapter 6.

2. UFSAR, Chapter 15.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.10 Distribution Systems – Shutdown

BASES

BACKGROUND

A description of the AC, DC, and AC vital bus electrical power distribution systems is provided in the Bases for LCO 3.8.9, "Distribution Systems(Operating" and the Bases for LCO 3.8.5, "DC Sources – Shutdown."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safety Feature (ESF) systems are OPERABLE. The AC, DC, and AC vital bus 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 systems and AC vital buses 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 distribution systems, and AC vital buses during MODES 5 and 6 ensures that:

a. The unit 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 a fuel handling accident.

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

(continued)

BASES (continued)

LCO

Various combinations of subelectrical distribution systems, equipment, and components are required OPERABLE by other LCOs, depending on the specific unit 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 required systems, equipment and components(all specifically addressed in each LCO and implicitly required via the definition of OPERABILITY.

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

APPLICABILITY

The AC and DC electrical power distribution systems required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies within containment, and during movement of fuel assemblies in the fuel storage pool, provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;

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 and refueling condition.

The AC, and DC electrical power distribution systems, and AC vital buses requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.9.

The term fuel assembly includes irradiated fuel, non-irradiated fuel, and the dummy fuel assembly.

(continued)

BASES (continued)

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, A.2.4, A.2.5, and A.2.6

Although redundant required features may require redundant trains of electrical power distribution subsystems to be OPERABLE, one OPERABLE distribution system may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and fuel movement. By allowing the option to declare required features associated with an inoperable distribution system inoperable, appropriate restrictions are implemented in accordance with the affected distribution systems 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, and suspend movement of ~~irradiated~~ fuel assemblies within containment, and suspend movement of fuel assemblies in the fuel storage pool, and suspend operations involving positive reactivity additions that could result in loss of required SDM (Mode 5) or boron concentration (Mode 6). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

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 unit safety systems.

Notwithstanding performance of the above conservative Required Actions, a required shutdown cooling (SDC) system may be inoperable. In this case, these Required Actions of Condition A do not adequately address the concerns relating to coolant circulation and heat removal. Pursuant to LCO 3.0.6, the SDC ACTIONS would not be entered.

(continued)

BASES (continued)

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, A.2.4, A.2.5 and A.2.6 (continued)

Therefore, the Required Actions of Condition A direct declaring SDC inoperable, which results in taking the appropriate SDC actions.

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

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

This Surveillance verifies that the AC, DC, and AC vital bus electrical power distribution system is functioning properly, with all the required buses energized. The verification of proper voltage availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. The 7-day frequency takes into account the redundant capability of the electrical power distribution systems and other indications available in the control room that alert the operator to subsystem malfunctions.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.

(continued)

B 3.9 REFUELING OPERATIONS

B 3.9.3 Containment Penetrations

BASES

BACKGROUND

During CORE ALTERATIONS or movement of fuel assemblies within containment with irradiated fuel in containment, a release of fission product radioactivity within the containment will be restricted from escaping to the environment when the LCO requirements are met. In MODES 1, 2, 3, and 4, this is accomplished by maintaining containment OPERABLE as described in LCO 3.6.1, "Containment." In MODE 6, the potential for containment pressurization as a result of an accident is not likely; therefore, requirements to isolate the containment from the outside atmosphere can be less stringent. The LCO requirements are referred to as "containment closure" rather than "containment OPERABILITY." Containment closure means that all potential escape paths are closed or capable of being closed. Since there is no potential for containment pressurization, the Appendix J, Option B leakage criteria and tests are not required.

The containment serves to contain fission product radioactivity that may be released from the reactor core following an accident, such that offsite radiation exposures are maintained well within the requirements of 10 CFR 100. Additionally, the containment structure provides radiation shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment equipment hatch, which is part of the containment pressure boundary, provides a means for moving large equipment and components into and out of containment. During CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies within containment, the equipment hatch must be held in place by at least four bolts. Good engineering practice dictates that the bolts required by this LCO be approximately equally spaced.

The containment air locks, which are also part of the containment pressure boundary, provide a means for personnel access during MODES 1, 2, 3, and 4 operation in accordance with LCO 3.6.2, "Containment Air Locks." Each air lock has a door at both ends. The doors are normally interlocked to prevent simultaneous opening when containment OPERABILITY is required. During periods of shutdown when containment

(continued)

BASES (continued)

BACKGROUND (continued)

closure is not required, the door interlock mechanism may be disabled, allowing both doors of an air lock to remain open for extended periods when frequent containment entry is necessary. During CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies within containment, containment closure is required; therefore, the door interlock mechanism may remain disabled, but one air lock door must always remain closed or operable. Operability of the containment personnel airlock door requires that the door is capable of being closed; that the door is unblocked and no cables or hoses are being run through the airlock; and that a designated individual is continuously available to close the airlock door. This individual must be stationed at the outer airlock door.

The use of temporary ramps for equipment access through the containment personnel air lock doors is acceptable during CORE ALTERATIONS or moving of ~~irradiated~~ fuel within containment. These ramps do not impede closure of the containment personnel airlock doors as the ramps are quickly removed by the designated individual stationed at the outer door. Removal of the ramps is a normal function of door closure, and the ability of plant personnel to close the personnel airlock, if needed, is not compromised by the ramps. Similarly, door seal covers may be used, provided they are removed prior to air lock door closure.

Except the systems that are closed inside of containment, systems conducting a fluid in and/or out of containment can also satisfy LCO 3.9.3 in either of the following configurations:

a. Systems containing devices inside containment which would preclude free air flow from containment such as self-closing quick disconnects, relief valves venting to containment, check valve(s), five foot water seal (periodic seal verification required), reciprocating pump, pipe cap, or any other equivalent device which would preclude free air flow out of containment.

b. Systems containing devices outside containment which would preclude free air flow from containment such as a reciprocating air compressor, compressed gas cylinder, or any of the devices listed in "a" above.

(continued)

BASES (continued)

BACKGROUND (continued)

These closure devices and lines connecting them to containment should be nonflammable and are not subject to Local Leak Rate Testing. Small bore tubing and flexible lines need not be seismically supported but should be protected from damage which could affect Containment Closure.

The routing of temporary services, such as breathing air through opened penetrations during fuel movement is permissible if the following conditions are established:

a. The area surrounding the service passing through the containment wall shall be sealed. This criteria may be met by using an existing pipe or cable penetration or by providing a method of sealing around the service pipe, hose or cable at the containment wall such that there can be no free passage of air between the containment atmosphere and the outside atmosphere.

b. If the service carries a liquid or gas, at least one end shall be closed such that there can be no free passage of air through the service hose or pipe between the containment atmosphere and the outside atmosphere. This requirement shall be able to be met even if pressure or flow is lost in the service system.

Check valves serving these lines prevent backflow from the containment atmosphere to the outside atmosphere.

Procedures for fulfilling proposed SURVEILLANCE REQUIREMENT 3.9.3.1 should contain provisions for identifying temporary services penetrating containment, and for determining that such penetrations satisfy the above criteria prior to fuel movement and periodically during fuel movement.

The requirements on containment penetration closure ensure that a release of fission product radioactivity within containment will be restricted from escaping to the environment.

The Containment Purge System includes two subsystems. The normal subsystem includes a 42 inch purge penetration and a 42 inch exhaust penetration. The second subsystem, a minipurge system, includes an 8 inch purge penetration and

(continued)

BASES (continued)

BACKGROUND (continued)

an 8 inch exhaust penetration. During MODES 1, 2, 3, and 4, the two valves in each of the normal purge and exhaust penetrations are secured in the closed position. The two valves in each of the two minipurge penetrations can be opened intermittently, but are closed automatically by the Containment Purge Isolation Signal (CPIS). Neither of the subsystems is subject to a Specification in MODE 5.

In MODE 6, large air exchanges are necessary to conduct refueling operations. The normal 42 inch purge system is used for this purpose and all valves are closed by the CPIS in accordance with LCO 3.3.8, "Containment Purge Isolation Signal (CPIS)."

The minipurge system is not normally used in MODE 6 with all four 8 inch valves in the closed position. However, as an alternative to normal purge, the minipurge system may be used in MODE 6 with CPIS operable.

The other containment penetrations that provide direct access from containment atmosphere to outside atmosphere must be isolated on at least one side. Isolation may be achieved by an OPERABLE automatic isolation valve, or by a manual isolation valve, blind flange, or equivalent. Equivalent isolation methods must be approved and may include use of a material that can provide a temporary atmospheric pressure ventilation barrier for the other containment penetrations during fuel movements.

APPLICABLE SAFETY ANALYSIS

During CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies within containment, the most severe radiological consequences result from a fuel handling accident. The fuel handling accident is a postulated event that involves damage to irradiated fuel (Ref. 1). Fuel handling accidents include dropping a single ~~irradiated~~ fuel assembly and handling tool or a heavy object onto ~~other~~ irradiated fuel assemblies. The requirements of LCO 3.9.6, "Refueling Water Level," and the minimum decay time of 72 hours prior to CORE ALTERATIONS ensure that the release of fission product radioactivity, subsequent to a fuel handling accident, results in doses that are well within the guideline values specified in 10 CFR 100.

Containment penetrations satisfy Criterion 3 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO

This LCO limits the consequences of a fuel handling accident in containment by limiting the potential escape paths for fission product radioactivity released within containment. The LCO requires any penetration providing direct access from the containment atmosphere to the outside atmosphere to be closed except for the OPERABLE containment purge and exhaust penetrations and the containment personnel airlock.

For the containment personnel airlock, this LCO ensures that the airlock can be closed after containment evacuation in the event of a fuel handling accident. The requirement that the plant be in Mode 6 with 23 feet of water above the fuel in the reactor vessel or defueled configuration with fuel in the containment (i.e., fuel in the refueling machine or upender) ensures that there is sufficient time to close the personnel airlock following a loss of shutdown cooling before boiling occurs.

LCO part a. is modified by a NOTE:

----------NOTE----------
The equipment hatch may be open if all of the following conditions are met:

1) The Containment Structure Equipment Hatch Shield Doors are capable of being closed within 30 minutes,
2) The plant is in Mode 6 with at least 23 feet of water above the reactor vessel flange,
3) A designated crew is available to close the Containment Structure Equipment Hatch Shield Doors,
4) Containment purge is in service, and
5) The reactor has been subcritical for at least 72 hours.

These restrictions include the administrative controls to allow the opening of the containment equipment hatch during CORE ALTERATIONS or movement of ~~irradiated~~ fuel in the containment provided that 1) The Containment Structure Equipment Hatch Shield Doors are capable of being closed within 30 minutes, 2) The plant is in Mode 6 with at least 23 feet of water above the reactor vessel flange, 3) A designated crew is available to close the Containment Structure Equipment Hatch Shield Doors, 4) Containment purge is in service, and 5) The reactor shall be subcritical for at least 72 hours. The Containment Structure Equipment Hatch Shield Doors include flashing on the top and sides of the shield doors which act to retard or restrict a release of post-accident fission products. The capability to close the containment shield doors includes requirements that the doors are capable of being closed and that any cables or hoses across the opening have quick disconnects to ensure the doors are capable of being closed within 30 minutes.

(continued)

BASES (continued)

LCO (continued)

The 30 minute closure time for the containment shield doors is considered to start when the control room communicates the need to shut the Containment Structure Equipment Hatch Shield Doors. This 30-minute requirement is significantly less than the fuel handling accident analysis assumption that the containment remains open to the outside environment for a two-hour period subsequent to the accident. Placing containment purge (i.e., main purge exhaust with or without supply) in service will ensure any release from containment will be monitored.

The administrative controls will also specify the responsibility to be able to communicate with the control room, and specify the responsibility to ensure that the containment shield doors are capable of being closed in the event of a fuel handling accident. These administrative controls will ensure containment closure would be established in the event of a fuel handling accident inside containment.

LCO part b. is modified by a NOTE which allows both doors of the containment airlock to be open provided:

a. one personnel airlock door is OPERABLE, and

b.1 the plant is in MODE 6 with 23 feet of water above the fuel in the reactor vessel, or

b.2 defueled configuration with fuel in containment (i.e., fuel in refueling machine or upender).

The OPERABILITY requirements ensure that the airlock door is capable of performing its function, and that a designated individual located outside of the affected area is available to close the door. For the OPERABLE containment purge and exhaust penetrations, this LCO ensures that these penetrations are isolable by the Containment Purge Isolation System. The OPERABILITY requirements for this LCO ensure that the automatic purge and exhaust valve closure times specified in the UFSAR can be achieved and therefore meet the assumptions used in the safety analysis to ensure releases through the valves are terminated, such that the radiological doses are within the acceptance limit.

APPLICABILITY

The containment penetration requirements are applicable during CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies (i.e., irradiated fuel, non-irradiated fuel, and the dummy fuel assembly) within containment because this is when there is a potential for a fuel handling accident. In MODES 1, 2, 3,

(continued)

BASES (continued)

APPLICABILITY (continued)

and 4, containment penetration requirements are addressed by LCO 3.6.1, "Containment." In MODES 5 and 6, when CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies within containment are not being conducted, the potential for a fuel handling accident does not exist. Therefore, under these conditions no requirements are placed on containment penetration status

ACTIONS

A.1 and A.2

With the containment equipment hatch, air locks, or any containment penetration that provides direct access from the containment atmosphere to the outside atmosphere not in the required status, including the Containment Purge Isolation System not capable of automatic actuation when the purge and exhaust valves are open, the unit must be placed in a condition in which the isolation function is not needed.

This is accomplished by immediately suspending CORE ALTERATIONS and movement of ~~irradiated~~ fuel assemblies within containment. Performance of these actions shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

This Surveillance demonstrates that each of the containment penetrations required to be in its closed position is in that position. The Surveillance on the open purge and exhaust valves will demonstrate that the valves are not blocked from closing. Also, the Surveillance will demonstrate that each valve operator has motive power, which will ensure each valve is capable of being closed by an OPERABLE automatic Containment Purge Isolation Signal (CPIS).

The Surveillance is performed every 7 days during CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies within the containment. As such, this Surveillance ensures that a postulated fuel handling accident that releases fission product radioactivity within the containment will not result in a release of fission product radioactivity to the environment.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.3.2

This Surveillance demonstrates that each containment purge and exhaust valve actuates to its isolation position on an actual or simulated high radiation signal. The 24 month Frequency maintains consistency with other similar ESFAS instrumentation and valve testing requirements. In LCO 3.3.8, "Containment Purge Isolation Signal," the Containment Purge Isolation Signal requires a CHANNEL CHECK every 7 days and a CHANNEL FUNCTIONAL TEST every 92 days to ensure the channel OPERABILITY during refueling operations. Every 24 months a CHANNEL CALIBRATION is performed. The signal actuation response time is demonstrated every 24 months, during refueling, on a STAGGERED TEST BASIS. SR 3.6.3.5 demonstrates that the isolation time of each valve is in accordance with the Inservice Testing Program requirements. These surveillances will ensure that the valves are capable of closing after postulated fuel handling accident to limit a release of fission product radioactivity from the containment.

REFERENCE

1. NUREG-0712, Safety Evaluation Report related to the operation of San Onofre Nuclear Generating Station, Units 2 and 3, February 1981.

B 3.9 REFUELING OPERATIONS

B 3.9.6 Refueling Water Level

BASES

BACKGROUND

During movement of fuel assemblies or CEAs within the reactor pressure vessel ~~when either the fuel assemblies being moved or the fuel assemblies seated within the reactor pressure vessel are irradiated~~, and during movement of ~~irradiated~~ fuel assemblies within containment, a minimum water level of 23 ft above the top of the reactor vessel flange is required. During refueling this maintains sufficient water level in the refueling canal and the fuel transfer canal. Sufficient water is necessary to retain iodine fission product activity in the water in the event of a fuel handling accident (Refs. 1 and 2). Sufficient iodine activity is well within the guidelines of 10CFR 100.

APPLICABLE SAFETY ANALYSES

During movement of fuel assemblies (i.e., irradiated fuel, non-irradiated fuel, and the dummy fuel assembly) or CEAs within the reactor pressure vessel ~~when either the fuel assemblies being moved or the fuel assemblies seated within the reactor pressure vessel are irradiated~~, and during movement of ~~irradiated~~ fuel assemblies within containment, the water level in the refueling canal is an initial condition design parameter in the analysis of the fuel handling accident in containment postulated by Regulatory Guide 1.25 (Ref. 1). A minimum water level of 23 ft (Regulatory Position C.1.c of Ref. 1) allows a decontamination factor of 100 (Regulatory Position C.1.g of Ref. 1) to be used in the accident analysis for iodine. This relates to the assumption that 99% of the total iodine released from the pellet to cladding gap of all the dropped fuel assembly rods is retained by the refueling canal water. The fuel pellet to cladding gap is assumed to contain 10% of the total fuel rod iodine inventory (Ref. 1).

The fuel handling accident analysis inside containment is described in Reference 2. With a minimum water level of 23 ft and a minimum decay time of 72 hours prior to fuel handling, the analysis and test programs demonstrate that the iodine release due to a postulated fuel handling accident is adequately captured by the water and offsite doses are maintained within allowable limits (Ref. 4).

Refueling water level satisfies Criterion 2 of the NRC Policy Statement.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES (continued)

The applicability statement is modified by a note which allows that the water level may be lowered to a minimum of 23 feet above the top of the fuel for movement of four finger CEAs, coupling and uncoupling of CEA extension shafts or for verifying the coupling and uncoupling.

LCO

A minimum refueling water level of 23 ft above the reactor vessel flange is required to ensure that the radiological consequences of a postulated fuel handling accident inside containment are within acceptable limits as provided by the guidance of Reference 3.

APPLICABILITY

LCO 3.9.6 is applicable during movement of fuel assemblies or CEAs within the reactor pressure vessel ~~when either the fuel assemblies being moved or the fuel assemblies seated with the reactor pressure vessel are irradiated~~, and during movement of ~~irradiated~~ fuel assemblies within containment. A note provides an exception that the water level may be lowered to a minimum of 23 feet above the top of the fuel for movement of four finger CEAs, coupling and uncoupling of CEA extension shafts or for verifying the coupling and uncoupling. The LCO minimizes the possibility of a fuel handling accident in containment that is beyond the assumptions of the safety analysis. If irradiated fuel is not present in containment, there can be no significant radioactivity release as a result of a postulated fuel handling accident. Requirements for fuel handling accidents in the spent fuel pool are covered by LCO 3.7.16, "Fuel Storage Pool Water Level."

ACTIONS

A.1 and A.2

With a water level of < 23 ft above the top of the reactor vessel flange, all operations involving CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies in containment shall be suspended immediately to ensure that a fuel handling accident cannot occur.

The suspension of CORE ALTERATIONS and fuel movement shall not preclude completion of movement of a component to a safe position.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

Verification of a minimum water level of 23 ft above the top of the reactor vessel flange ensures that the design basis for the postulated fuel handling accident analysis during refueling operations is met. Water at the required level above the top of the reactor vessel flange limits the consequences of damaged fuel rods that are postulated to result from a fuel handling accident inside containment (Ref. 2).

The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls of valve positions, which make significant unplanned level changes unlikely.

REFERENCES

1. Regulatory Guide 1.25, March 23, 1972.
2. UFSAR, Section 15.7.3.9.
3. NUREG-0712, Safety Evaluation Report related to the operation of San Onofre Nuclear Generating Station, Units 2 and 3, February 1981.
4. 10 CFR 100.10.

(continued)

Attachment 7

Proposed Technical Specifications Bases Markup Pages, Unit 3

(For Information Only)

B 3.3 INSTRUMENTATION

B 3.3.8 Containment Purge Isolation Signal (CPIS)

BASES

BACKGROUND

This LCO encompasses the CPIS, which is a plant specific instrumentation channel that performs an actuation function required for plant protection but is not otherwise included in LCO 3.3.6, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip," or LCO 3.3.7, "Diesel Generator (DG) – Undervoltage Start."

A CPIS radiation monitor will generate a train related containment purge isolation signal (CPIS) upon detection of high gaseous radiation in containment. This signal in turn initiates a close signal to all same train containment purge valves, both main and minipurge.

The CPIS includes two independent, redundant logic subsystems, including actuation trains. Each train employs one gaseous sensor.

If either one of the corresponding sensors exceeds the bistable trip setpoint, the CPIS train will be actuated.

Each train actuates a separate series valve in the containment purge supply and return lines. Either train controls sufficient equipment to perform the isolation function. Minipurge valves are also isolated automatically on a Safety Injection Actuation Signal (SIAS) and Containment Isolation Actuation Signal (CIAS) in Modes 1-3.

Trip Setpoints

The trip setpoint is set sufficiently high to prevent spurious alarms/trips yet sufficiently low to assure an alarm/trip should an inadvertent release occur. Compliance with this requirement provides suitable confirmation that the monitors are capable of performing their intended function.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The containment airborne radiation monitors will generate an isolation signal for the containment purge in the event of a LOCA. However, containment isolation is expected to occur on either a safety injection actuation system signal or a containment isolation actuation system signal prior to initiation on a CPIS signal on high radiation in containment. In addition, the calculations show that, following a fuel handling accident in containment due to the response time of the containment airborne radiation monitors there will be some release of radioactivity to the environment prior to isolation of the purge by the CPIS.

In order to calculate the off-site doses resulting from such a release, it was conservatively assumed that all of the airborne radioactivity resulting from a fuel handling accident in containment was released to the environment (i.e., the containment purge was not isolated following a fuel handling accident). The analysis showed that the 0-2 hour site boundary (exclusion area boundary [EAB]) thyroid dose and the 0-2 hour site boundary whole body (WB) dose would be below the Standard Review Plan (SRP) 15.7.4 limits of 75 rem thyroid and 6 rem WB (these SRP limits are based on 25 percent of the 10 CFR 100 limits).

General Design Criteria (GDC) 19 specifies that adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem WB, or its equivalent to any part of the body, for the duration of the accident. SRP 6.4 defines the dose-equivalent to the thyroid as 30 rem. The analysis demonstrated that the dose values are below those specified in GDC 19 as delineated by SRP 6.4.

(continued)

BASES (continued)

LCO

LCO 3.3.8 requires one CPIS channel to be OPERABLE. The required channel consists of gaseous radiation monitors; Actuation Logic; and Manual Trip.

The Bases for the LCO on CPIS are discussed below for each Function:

a. Manual Trip

The LCO on Manual Trip backs up the automatic trip and ensures operators have the capability to rapidly initiate the CPIS Function if any parameter is trending toward its setpoint. One manual channel of CPIS is required in MODES 1, 2, 3, and 4, since the CPIS is redundant with the CIAS and SIAS. One manual channel of CPIS is required during CORE ALTERATIONS and movement of ~~irradiated~~ fuel assemblies, since there are additional means of closing the containment purge valves in the event of a channel failure.

b. Gaseous Airborne Radiation

The monitor detects in containment gaseous airborne radiation and provides an alarm and trip function upon reaching the setpoint value. The trip function opens a contact in the actuation logic. There are two monitors with input into redundant actuation trains.

c. Actuation Logic

Actuation logic provides close signals to both mini and main train related containment purge valves.

APPLICABILITY

In MODES 1, 2, 3, and 4, the minipurge valves may be open. In these MODES, it is necessary to ensure the valves will shut in the event of a primary leak in containment whenever any of the containment purge valves are open.

With the purge valves open during CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies (i.e., irradiated fuel assemblies, non-irradiated fuel assemblies, and the dummy fuel assembly) within containment, a fuel handling accident would require CPIS on high radiation in containment.

(continued)

BASES (continued)

APPLICABILITY (Continued)

The APPLICABILITY is modified by a Note, which states that the CPIS Specification is only required when the penetration is not isolated by appropriate closed and de-activated automatic valve(s), closed manual valve(s), or blind flange(s).

ACTIONS

A CPIS channel is inoperable when it does not satisfy the OPERABILITY criteria for the channel's function. The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the plant specific setpoint analysis. Typically, the drift is not large and would result in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it within specification. If the trip setpoint is not consistent with the value specified in the Surveillance Requirement SR 3.3.8.2, the channel must be declared inoperable immediately, and the appropriate Conditions must be entered.

In the event a channel's trip setpoint is found nonconservative with respect to the value specified in the Surveillance Requirement SR 3.3.8.2, or the sensor, instrument loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that channel are required to be declared inoperable and the LCO Condition entered for the particular protective function affected.

A.1

Condition A applies to the failure of CPIS, Actuation Logic, and gaseous radiation monitors. The Required Action is to enter the applicable Conditions and Required Actions for affected valves of LCO 3.6.3, "Containment Isolation Valves." The Completion Time accounts for the condition that the capability to isolate containment on valid containment high radiation or manual signals is degraded during power operation or shutdown modes.

(continued)

BASES (continued)

ACTIONS (continued)

B.1 and B.2

Condition B applies when the Required Action and associated Completion Time of Condition A are not met in MODE 1, 2, 3, or 4. If Required Action A cannot be met 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 6 hours and to MODE 5 within 36 hours.

C.1

Condition C applies when one or more required channels of gaseous airborne radiation monitors are inoperable. The appropriate action is to enter LCO 3.4.15.

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

Condition D applies to the same conditions as are described in Condition A; however, the applicability is during CORE ALTERATIONS or during the movement of ~~irradiated~~ fuel assemblies within containment. Required Action D.1 is to place the containment purge and exhaust isolation valves in the closed position. The Required Action immediately performs the isolation function of the CPIS. Required Actions D.2.1 and D.2.2 may be performed in lieu of Required Action D.1. Required Action D.2.1 requires the suspension of CORE ALTERATIONS and Required Action D.2.2 requires suspension of movement of ~~irradiated~~ fuel in containment immediately. The Completion Time accounts for the fact that the automatic capability to isolate containment on valid containment high radiation signals is degraded during conditions in which a fuel handling accident is possible and CPIS provides the only automatic mitigation of radiation release.

SURVEILLANCE REQUIREMENTS

SR 3.3.8.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred on the required gaseous airborne radiation monitor channels used in the CPIS. A CHANNEL CHECK is a comparison of the

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.8.1 (continued)

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 two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

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 match criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit.

The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Thus, performance of the CHANNEL CHECK guarantees that undetected overt channel failure is limited to 12 hours. Since the probability of two random failures in redundant channels in any 12 hour period is low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.

SR 3.3.8.2

A CHANNEL FUNCTIONAL TEST is performed on the required containment gaseous airborne radiation monitoring channel to ensure the entire channel will perform its intended function. Setpoints must be found as specified in SR 3.3.8.2 and left consistent with the assumptions of the setpoint analysis. The Frequency of 92 days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 92 day Frequency is a rare event.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.3.8.3

Proper operation of the individual initiation relays is verified by actuating these relays during the CHANNEL FUNCTIONAL TEST of the Actuation Logic every 24 months. This will actuate the Function, operating all associated equipment. Proper operation of the equipment actuated by each train is thus verified. The Frequency of 24 months is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function during any 24 month interval is a rare event. A Note to the SR indicates that this Surveillance includes verification of operation for each initiation relay.

SR 3.3.8.4

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. Measurement error determination, setpoint error determination, and calibration adjustment must be performed consistent with the plant specific setpoint analysis. The channel shall be left calibrated consistent with the assumptions of the current setpoint analysis.

The 24 month 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.

SR 3.3.8.5

This Surveillance ensures that the train actuation response times are less than or equal to the maximum times assumed in the analyses. The 24 month Frequency is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences. Testing of the final actuating devices, which make up the bulk of the response time, is included in the Surveillance.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.3.8.6

Every 24 months, a CHANNEL FUNCTIONAL TEST is performed on the CPIS Manual Trip channel.

This test verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing manual actuation of the Function. The 24 month 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 these components usually pass the Surveillance when performed at a Frequency of once every 24 months.

REFERENCES

1. SONGS Units 2 and 3 UFSAR, Chapter 15.
2. 10 CFR 100.

BASES (continued)

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BASES (continued)

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B 3.3 INSTRUMENTATION

B 3.3.9 Control Room Isolation Signal (CRIS)

BASES

BACKGROUND

This LCO encompasses CRIS actuation, which is a plant specific instrumentation channel that performs an actuation function required for plant protection but is not otherwise included in LCO 3.3.6, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip," or LCO 3.3.7, "Diesel Generator (DG) – Loss of Voltage Start (LOVS)." This is a non-Nuclear Steam Supply System ESFAS Function that, because of differences in purpose, design, and operating requirements, is not included in LCO 3.3.6 and LCO 3.3.7.

The CRIS terminates the normal supply of outside air to the control room and initiates actuation of the Control Room Emergency Air Cleanup System (CREACUS) to minimize operator radiation exposure. The CRIS includes two independent, redundant trains. Each train consists of a gaseous radiation monitor, manual trip function and actuation logic. If the bistable monitoring either sensor indicates an unsafe condition, that train will be actuated (one-out-of-two logic). Each train related actuation signal operates the same train isolation equipment. Actuating either train will perform the intended function. Control room isolation also occurs on a Safety Injection Actuation Signal (SIAS) in MODES 1, 2, and 3.

Trip Setpoint

Accidents crediting control room isolation from the CRIS radiation monitor(s) have been evaluated with the setpoint specified in the Surveillance Requirement. The resulting dose to the control room operators is within the 10CFR50 Appendix A General Design Criteria 19 limits.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The CRIS, in conjunction with the Control Room Emergency Air Cleanup System (CREACUS), maintains the control room atmosphere within conditions suitable for prolonged occupancy throughout the duration of any one of the accidents discussed in Reference 1. The radiation exposure of control room personnel, through the duration of any one of the postulated accidents discussed in "Accident Analysis," SONGS Units 2 and 3 UFSAR, Chapter 15 (Ref. 1), does not exceed the limits set by 10 CFR 50, Appendix A, GDC 19 (Ref. 3).

LCO

LCO 3.3.9 requires one channel of CRIS to be OPERABLE. The required channel consists of Actuation Logic, Manual Trip, and gaseous radiation monitors. The specified value for the setpoint of the CRIS is listed in the SR.

The Bases for the LCO on the CRIS are discussed below for each Function:

a. Manual Trip

The LCO on Manual Trip backs up the automatic trips and ensures operators have the capability to rapidly initiate the CRIS Function if any parameter is trending toward its setpoint. One channel must be OPERABLE. This considers that the Manual Trip capability is a backup and that other means are available to actuate the redundant train if required, including manual SIAS.

b. Airborne Radiation

One channel of Airborne Radiation detection in the required train is required to be OPERABLE to ensure the control room isolates on high gaseous concentration.

c. Actuation Logic

One train of Actuation Logic must be OPERABLE, since there are alternate means available to actuate the redundant train, including SIAS.

(continued)

BASES (continued)

APPLICABILITY

The CRIS Functions must be OPERABLE in MODES 1, 2, 3, 4, 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies in containment, and during movement of fuel assemblies in the spent fuel pool, to ensure a habitable environment for the control room operators.

The term fuel assembly includes irradiated fuel, non-irradiated fuel, and the dummy fuel assembly.

ACTIONS

A CRIS channel is inoperable when it does not satisfy the OPERABILITY criteria for the channel's function. The most common cause of channel inoperability is outright failure or drift of the bistable or process module. Typically, the drift is not large and would result in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it within specification. If the trip setpoint is not within the specified value, the channel is inoperable and the appropriate Conditions must be entered. The provisions of LCO's 3.0.3 and 3.0.4 are not applicable to this specification, as indicated by the two NOTES.

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

Conditions A and B have been modified by a Note, which specifies that CREACUS be placed manually in the isolation mode if the automatic transfer to the isolation mode is inoperable.

Conditions A and B are applicable to manual and automatic actuation of the CREACUS by CRIS. Condition A applies to the failure of the CRIS Manual Trip, Actuation Logic, and required gaseous radiation monitor channels in MODE 1, 2, 3, or 4. Entry into this Condition requires action to either restore the failed channel(s) or manually perform the CRIS safety function (Required Action A.1). The Completion Time of 1 hour is sufficient to complete the Required Actions and accounts for the fact that CRIS supplements control room isolation by other Functions in MODES 1, 2, 3, and 4.

(continued)

BASES (continued)

ACTIONS (continued)

Condition B applies to the failure of CRIS Manual Trip, Actuation Logic, ~~and~~ or required gaseous radiation monitor channels in Mode 5 or 6, or ~~when moving~~ during movement of ~~irradiated~~ fuel assemblies in containment and in the fuel storage pool. The Required Actions are immediately taken to place one OPERABLE CREACUS train in the emergency mode, or to suspend positive reactivity additions, and suspend movement of ~~irradiated~~ fuel assemblies in containment and in the fuel storage pool. The Completion Time recognizes the fact that the radiation signals are the only Functions available to initiate control room isolation in the event of a fuel handling accident.

Required Action B.2.2 is modified by a note to indicate that normal plant control operations that individually add limited positive reactivity (e.g., temperature or boron fluctuations associated with RCS inventory management or temperature control) are not precluded by this Action, provided they are accounted for in the calculated SDM.

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is 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 two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

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 match criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit.

The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Thus, performance of the CHANNEL CHECK guarantees that undetected overt channel failure is limited to 12 hours. Since the probability of two random failures in redundant channels in any 12 hour period is low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1 (continued)

supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.

SR 3.3.9.2

A CHANNEL FUNCTIONAL TEST is performed on the required control room radiation monitoring channel to ensure the entire channel will perform its intended function. As found and as left setpoints are recorded.

The Frequency of 92 days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 92 day interval is a rare event.

SR 3.3.9.3

Proper operation of the individual initiation relays is verified by de-energizing these relays during the CHANNEL FUNCTIONAL TEST of the Actuation Logic every 18 months. This will actuate the Function, operating all associated equipment. Proper operation of the equipment actuated by each train is thus verified.

The Frequency of 18 months is based on plant operating experience with regard to channel OPERABILITY, which demonstrates that failure of more than one channel of a given Function in any 18 month interval is a rare event.

A Note indicates this Surveillance includes verification of operation for each initiation relay.

SR 3.3.9.4

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Frequency of an 18 month calibration interval is based on experience with the magnitude of equipment drift in this period.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.9.5

Every 18 months, a CHANNEL FUNCTIONAL TEST is performed on the manual CRIS actuation circuitry.

This test verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing Manual Trip of the function. The 18 month 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 these components usually pass the Surveillance when performed at a Frequency of once every 18 months.

SR 3.3.9.6

This Surveillance ensures that the train actuation response times are less than or equal to the maximum times assumed in the analyses. A time limit to isolate the control room is needed to ensure compliance with 10 CFR 50 Appendix A General Design Criterion 19. The 18 month frequency is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences. The response time is tested from the module input; i.e., the radiation detector response is not measured. Testing of the final actuating devices is included in the Surveillance. Response time testing acceptance criteria are included in Reference 4.

REFERENCES

1. SONGS Units 2 and 3 UFSAR, Chapter 15.
2. SCE Calculation A-92-NF-003.
3. 10 CFR 50, Appendix A, GDC 19.
4. Licensee Controlled Specification 3.3.100, "RPS/ESFAS Response Times."

BASES (continued)

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B 3.7 PLANT SYSTEMS

B 3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

BASES

BACKGROUND

The CREACUS provides a protected environment from which occupants can control the plant following an uncontrolled release of radioactivity, hazardous chemicals, or smoke.

The CREACUS consists of two independent, redundant trains that recirculate and filter air in the control room envelope (CRE) and a CRE boundary that limits the inleakage of unfiltered air. Each CREACUS train consists of emergency air conditioning unit, emergency ventilation air supply unit, emergency isolation dampers, and cooling coils and two cabinet coolers per Unit. Each emergency air conditioning unit includes a prefilter, a high efficiency particulate air (HEPA) filter, an activated carbon adsorber section for removal of gaseous activity (principally iodines), and a fan. A second bank of HEPA filters follows the adsorber section to collect carbon fines. Each emergency ventilation air supply unit includes prefilter, HEPA filter, carbon adsorber and fan. Ductwork, motor-operated dampers, doors, barriers, and instrumentation also form part of the system. Air and motor-operated dampers are provided for air volume control and system isolation purposes.

The CRE is the area within the confines of the CRE boundary that contains the spaces that control room occupants inhabit to control the unit during normal and accident conditions. This area encompasses the control room, and may encompass other non-critical areas to which frequent personnel access or continuous occupancy is not necessary in the event of an accident. The CRE is protected during normal operation, natural events, and accident conditions. The CRE boundary is the combination of walls, floor, roof, ducting, doors, penetrations and equipment that physically form the CRE. The OPERABILITY of the CRE boundary must be maintained to ensure that the inleakage of unfiltered air into the CRE will not exceed the inleakage assumed in the licensing basis analyses of design basis accident (DBA) consequences to CRE occupants. The CRE and its boundary are defined in the Control Room Envelope Habitability Program.

(continued)

BASES (continued)

BACKGROUND (continued)

Upon receipt of the actuating signal, normal air supply to the CRE is isolated, and the stream of ventilation air is recirculated through the system's filter trains. The prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 15 minutes per month verifies proper system operability.

There are two CREACUS operational modes. Emergency mode is an operational mode when the control room is isolated to protect operational personnel from radioactive exposure through the duration of any one of the postulated limiting faults discussed in Chapter 15 UFSAR (Ref. 2). Isolation mode is an operational mode when the CRE is isolated to protect operational personnel from toxic gasses and smoke.

Actuation of the CREACUS places the system into either of two separate states of operation, depending on the initiation signal. Actuation of the system to either the emergency mode r isolation mode of CREACUS operation closes the unfiltered-outside-air intake and unfiltered exhaust dampers, and aligns the system for recirculation of air within the CRE through the redundant trains of HEPA and charcoal filters.

The emergency mode also initiates pressurization of the CRE. Outside air is added to the air being recirculated from the CRE. Pressurization of the CRE minimizes infiltration of unfiltered air through the CRE boundary from all the surrounding areas adjacent to the CRE boundary.

The CRE supply and the outside air supply of the normal control room HVAC are monitored by radiation and toxic-gas detectors respectively. One detector output above the setpoint will cause actuation of the emergency mode or isolation mode as required. The actions of the isolation mode are more restrictive, and will override the actions of the emergency mode of operation. However, toxic gas and radiation events are not considered to occur concurrently.

(continued)

BASES (continued)

BACKGROUND (continued)

Redundant recirculation trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally-open isolation dampers are arranged in series pairs so that one damper's failure to shut will not result in a breach of isolation. The CREACUS is designed in accordance with Seismic Category I requirements.

The CREACUS is designed to maintain a habitable environment in the CRE for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5-rem total effective dose equivalent (TEDE).

APPLICABLE SAFETY ANALYSES

The CREACUS components are arranged in redundant, safety related ventilation trains. The location of components and ducting within the CRE ensures an adequate supply of filtered air to all areas requiring access.

The CREACUS provides airborne radiological protection for the CRE occupants, as demonstrated by the CRE occupant dose analyses for the most limiting design basis loss of coolant accident fission product release presented in the UFSAR, Chapter 15 (Ref. 2).

Dose calculations, as specified in Unit 2/3 UFSAR Chapter 15 (Reference 2), only take credit for the HEPA filters and charcoal adsorbers of the emergency recirculation air conditioning unit. The emergency ventilation supply unit is designed to contribute to the pressurization of the control room to minimize unfiltered inleakage as indicated in Unit 2/3 UFSAR.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES (continued)

The CREACUS provides protection from smoke and hazardous chemicals to the CRE occupants. The analysis of hazardous chemical releases demonstrates that the toxicity limits are not exceeded in the CRE following a hazardous chemical release (Ref. 3). The evaluation of a smoke challenge demonstrates that it will not result in the inability of the CRE occupants to control the reactor either from the control room or from the remote shutdown panels (Ref. 4).

The worst case single active failure of a component of the CREACUS, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

The CREACUS satisfies Criterion 3 of the NRC Policy Statement.

LCO

Two independent and redundant trains of the CREACUS are required to be OPERABLE to ensure that at least one is available if a single active failure disables the other train. Total system failure, such as from a loss of both ventilation trains or from an inoperable CRE boundary, could result in exceeding a dose of 5 rem TEDE to the CRE occupants in the event of a large radioactive release.

Each CREACUS train is considered OPERABLE when the individual components necessary to limit CRE occupant exposure are OPERABLE. A CREACUS train is considered OPERABLE when the associated:

a. Fan is OPERABLE;

b. HEPA filters and charcoal adsorber are not excessively restricting flow, and are capable of performing their filtration functions; and

(continued)

BASES (continued)

LCO (continued)

c. Ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained. If an Emergency Isolation Damper is stuck open, the associated train of CREACUS may still be considered OPERABLE if the redundant damper in series with the inoperable damper is closed with power removed.

In order for the CREACUS trains to be considered OPERABLE, the CRE boundary must be maintained such that CRE occupant dose from a large radioactive release does not exceed the calculated dose in the licensing basis consequence analyses for DBAs, and that CRE occupants are protected from hazardous chemicals and smoke.

The LCO is modified by a Note allowing the CRE boundary to be opened intermittently under administrative controls. This note only applies to openings in the CRE boundary that can be rapidly restored to the design condition, such as doors, hatches, floor plugs, and access panels. For entry and exit through 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 CRE. This individual will have a method to rapidly close the opening and to restore the CRE boundary to a condition equivalent to the design condition when a need for CRE isolation is indicated.

(continued)

BASES (continued)

APPLICABILITY

In MODES 1, 2, 3, 4, 5, and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies in containment, and during movement of fuel assemblies in the fuel storage pool, the CREACUS must be OPERABLE to ensure that the CRE will remain habitable during and following a DBA.

The term fuel assembly includes irradiated fuel, non-irradiated fuel, and the dummy fuel assembly.

In MODES 5 and 6, the CREACUS is required to cope with the release from a rupture of a waste gas tank.

During movement of ~~irradiated~~ fuel assemblies, the CREACUS must be OPERABLE to cope with the release from a fuel handling accident involving ~~handling~~ irradiated fuel.

ACTIONS

ACTION statements are modified by two NOTES. NOTE 1 says: "The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration."

Specification 3.0.4 establishes that entry into an operational mode or other specified condition shall not be made unless the conditions of the LCO are met. Applicability statement "During movement of ~~irradiated~~ fuel assemblies in containment, and during movement of fuel assemblies in the fuel storage pool" ensures the OPERABILITY of both CREACUS trains prior to the start of movement of ~~irradiated~~ fuel assemblies.

NOTE 2 says: "Each Unit shall enter applicable ACTIONS separately." CREACUS is a shared system between Unit 2 and Unit 3. LCO doesn't address the operational situation when the Units are in different operational MODES. Without this NOTE it may not be clear what ACTIONS should be taken.

(continued)

BASES (continued)

ACTIONS (continued)

A.1

With one CREACUS train inoperable, for reasons other than an inoperable CRE boundary, action must be taken to restore OPERABLE status within 14 days. The 14 day AOT is based on a probabilistic risk assessment that does not require administrative controls to be implemented when a CREACUS train is taken out of service. In this Condition, the remaining OPERABLE CREACUS train is adequate to perform the CRE occupant protection function.

However, the overall reliability is reduced because a failure in the OPERABLE CREACUS train could result in loss of CREACUS function. The 14 day Completion Time is based on the low probability of a DBA occurring during this time period, and the ability of the remaining train to provide the required capability.

B.1, B.2 and B.3

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

(continued)

BASES (continued)

ACTIONS (continued)

During the period that the CRE boundary is considered inoperable, action must be initiated to implement mitigating actions to lessen the effect on CRE occupants from the potential hazards of a radiological or chemical event or a challenge from smoke. Actions must be taken within 24 hours to verify that in the event of a DBA, the mitigating actions will ensure that CRE occupant radiological exposures will not exceed the calculated dose of the licensing basis analyses of DBA consequences, and that CRE occupants are protected from hazardous chemicals and smoke. These mitigating actions (i.e., actions that are taken to offset the consequences of the inoperable CRE boundary) should be preplanned for implementation upon entry into the condition, regardless of whether entry is intentional or unintentional. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90 day Completion Time is reasonable based on the determination that the mitigating actions will ensure protection of CRE occupants within analyzed limits while limiting the probability that CRE occupants will have to implement protective measures that may adversely affect their ability to control the reactor and maintain it in a safe shutdown condition in the event of a DBA. In addition, the 90 day Completion Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the CRE boundary.

C.1 and C.2

In MODES 1, 2, 3, or 4, if the inoperable CREACUS or the CRE boundary cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes the accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

(continued)

BASES (continued)

ACTIONS (continued)

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

In MODE 5 or 6, or during movement of ~~irradiated~~ fuel assemblies within containment, or during movement of fuel assemblies in the fuel storage pool, if Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE CREACUS train must be immediately placed in the emergency mode of operation. This action ensures that the remaining train is OPERABLE, that no failures preventing 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 could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel assemblies to a safe position.

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

When in MODE 5 or 6, or during movement of ~~irradiated~~ fuel assemblies within containment, or during movement of fuel assemblies in the fuel storage pool with two trains inoperable or with one or more CREACUS trains inoperable due to an inoperable CRE boundary, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

F.1

If both CREACUS trains are inoperable in MODE 1, 2, 3, or 4 for reasons other than an inoperable CRE boundary (i.e., Condition B), the CREACUS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

Standby systems should be checked periodically to ensure that they function properly. Since the environment and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system.

Cumulative operation of the system for at least 2 hours over a 31 day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filtes. The 2 hour time frame is based on a conservative engineering evaluation which calculated the time required to evaporate the moisture contained in the air trapped inside the CREACUS duct upstream of charcoal beds. The 31 day Frequency is based on the known reliability of the equipment, and the two train redundancy available.

SR 3.7.11.2

This SR verifies that the required CREACUS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREACUS filter tests are based on Regulatory Guide 1.52 (Ref. 5). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of theactivated charcoal (general use and following specific operations). Specific test Frequencies and additional information are discussed in detail in the VFTP.

The filtration efficiency only apply to the emergency recirculation air conditioning units E418 and E419. Therefore, testing for filtration efficiency is not required for the emergency ventilation supply units A206 and A207.

However, the specified air flow from the emergency ventilation units is required during the filtration efficiency testing of the emergency recirculation air conditioning units. Also, the air flow requirements which are specified in the VFTP apply to the emergency ventilation and emergency air conditioning units.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.11.3

This SR verifies that each CREACUS train starts and operates on an acutual or simulated actuation signal. The Frequency of 24 months is based on industry operating experience and is consistent with the typical refueling cycle.

SR 3.7.11.4

This SR verifies the OPERABILITY of the CRE boundary by testing for unfiltered air inleakage past the CRE boundary and into the CRE. The details of the testing are specified in the Control Room Envelope Habitability Program.

The CRE is considered habitable when the radiological dose to CRE occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem TEDE and the CRE occupants are protected from hazardous chemicals and smoke. This SR verifies that the unfiltered air inleakage into the CRE is no greater than the flow rate assumed in the licensing basis analyses of DBA consequences. When unfiltered air inleakage is greater than the assumed flow rate, Condition B must be entered. Required Action B.3 allows time to restore the CRE boundary to OPERABLE status provided mitigating actions can ensure that the CRE remains within the licensing basis habitability limits for the occupants following an accident. Compensatory measures are discussed in Regulatory Guide 1.196, Section C.2.7.3, (Ref. 6) which endorses, with exceptions, NEI 99-03, Section

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.11.4

8.4 and Appendix F (Ref. 7). These compensatory measures may also be used as mitigating actions as required by Required Action B.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 8). Options for restoring the CRE boundary to OPERABLE status include changing the licensing basis DBA consequence analysis, repairing the CRE boundary, or a combination of these actions. Depending upon the nature of the problem and the corrective action, a full scope inleakage test may not be necessary to establish that the CRE boundary has been restored to OPERABLE status.

REFERENCES

1. UFSAR, Section 9.4.

2. UFSAR, Chapter 15.

3. UFSAR, Section 6.4.

4. UFSAR, Section 9.5.

5. Regulatory Guide 1.52 (Rev. 2).

6. Regulatory Guide 1.196.

7. NEI 99-03, "Control Room Habitability Assessment," June 2001.

8. Letter from Eric J. Leeds (NRC) to James W. Davis (NEI) dated January 30, 2004, "NEI Draft White Paper, Use of Generic Letter 91-18 Process and Alternative Source Terms in the Context of Control Room Habitability." (ADAMS Accession No. ML040300694).

(continued)

B 3.7 PLANT SYSTEMS

B 3.7.16 Fuel Storage Pool Water Level

BASES

BACKGROUND

The minimum water level in the fuel storage pool meets the assumptions of iodine decontamination factors following a fuel handling accident. The specified water level shields and minimizes the general area dose when the storage racks are filled to their maximum capacity. The water also provides shielding during the movement of spent fuel.

A general description of the fuel storage pool design is given in the UFSAR, Section 9.1.2, Reference 1, and the Spent Fuel Pool Cooling and Cleanup System is given in the UFSAR, Section 9.1.3 (Ref. 2). The assumptions of the fuel handling accident are given in the UFSAR, Section 15.7.3.4 and 15.7.3.6 (Ref. 3 and Ref. 6).

APPLICABLE SAFETY ANALYSES

The minimum water level in the fuel storage pool meets the assumptions of the fuel handling accident described in Regulatory Guide 1.25 (Ref. 4). The resultant 2 hour thyroid dose to a person at the exclusion area boundary is a small fraction of the 10 CFR 100 (Ref. 5) limits.

According to Reference 4, there is 23 ft of water between the top of the damaged fuel bundle and the fuel pool surface for a fuel handling accident. With this 23 ft of water, the assumptions of Reference 4 can be used directly. In practice, this LCO preserves this assumption for the bulk of the fuel in the storage racks. In the case of a single bundle, dropped and lying horizontally on top of the spent fuel racks, there would be < 23 ft of water above the top of the bundle.

However, when the potential of a dropped fuel assembly exists (which is when fuel is being moved) a water level is maintained that would ensure that there would be >23 feet above the fuel assembly laying on top of the racks. This increased water level is required by LCO 3.9.6 when the fuel storage pool is connected to the refueling cavity and by station procedures whenever fuel is being moved.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES (continued)

The fuel storage pool water level satisfies Criterion 3 of the NRC Policy Statement.

LCO

The specified water level preserves the assumptions of the fuel handling accident analysis (Ref. 3). As such, it is the minimum required for fuel storage and movement within the fuel storage pool.

APPLICABILITY

This LCO applies during movement of ~~irradiated~~ fuel assemblies (i.e., irradiated fuel, non-irradiated fuel, and the dummy fuel assembly) in the fuel storage pool since the potential for a release of fission products exists.

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply.

When the initial conditions for an accident cannot be met, steps should be taken to preclude the accident from occurring. When the fuel storage pool water level is lower than the required level, the movement of ~~irradiated~~ fuel assemblies in the fuel storage pool is immediately suspended. This effectively precludes a spent fuel handling accident from occurring. This does not preclude moving a fuel assembly to a safe position.

If moving ~~irradiated~~ fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving ~~irradiated~~ fuel assemblies while in MODES 1, 2, 3, and 4, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of ~~irradiated~~ fuel assemblies is not sufficient reason to require a reactor shutdown.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.16.1

This SR verifies sufficient fuel storage pool water is available in the event of a fuel handling accident. The water level in the fuel storage pool must be checked periodically. The 7 day Frequency is appropriate because the volume in the pool is normally stable. Water level changes are controlled by unit procedures and are acceptable, based on operating experience.

During refueling operations, the level in the fuel storage pool is at equilibrium with that of the refueling canal, and the level in the refueling canal is checked daily in accordance with LCO 3.9.6, "Refueling Water Level."

REFERENCES

1. UFSAR, Section 9.1.2.
2. UFSAR, Section 9.1.3.
3. UFSAR, Section 15.7.3.4.
4. Regulatory Guide 1.25
5. 10 CFR 100.11.
6. UFSAR, Section 15.7.3.6

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 5 and 6 ensures that:

a. The unit 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 a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or 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, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in 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, 3, and 4, various deviations from the analysis assumptions and design requirements are allowed within the Required Actions. This allowance is in recognition that certain testing and maintenance activities

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES (continued)

must be conducted provided an acceptable level of risk is not exceeded. During MODES 5 and 6, performance of a significant number of required testing and maintenance activities is also required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO requirements are acceptable during shutdown modes based on:

a. The fact that time in an outage is limited. This is a risk prudent goal as well as a utility economic consideration.

b. Requiring appropriate compensatory measures for certain conditions. These may include administrative controls, reliance on systems that do not necessarily meet typical design requirements applied to systems credited in operating MODE analyses, or both.

c. Prudent utility consideration of the risk associated with multiple activities that could affect multiple systems.

d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

In the event of an accident during shutdown, this LCO ensures the capability to support systems necessary to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite diesel generator (DG) power.

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

LCO

One offsite circuit capable of supplying the onsite Class 1E power distribution subsystem(s) of LCO 3.8.10, "Distribution Systems – Shutdown," ensures that all required loads are powered from offsite power. An OPERABLE DG, associated with a distribution system train required to be OPERABLE by LCO 3.8.10, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite circuit. Together, OPERABILITY of the required offsite circuit and DG ensures the availability of

(continued)

BASES (continued)

LCO (continued)

sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

The qualified offsite circuit must be capable of maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the Engineered Safety Feature (ESF) bus(es). Qualified offsite circuits are those that are described in the UFSAR and are part of the licensing basis for the unit.

One source of offsite power (Offsite circuit #1) for each unit is normally provided through Reserve Auxiliary Transformers XR1 and XR2 for the specific unit. XR1 feeds one 4.16 KV ESF bus (Train A) A04 and XR2 feeds the other 4.16 KV ESF bus (Train B) A06 of the onsite Class 1E AC distribution system for each unit. The second source of offsite power (Offsite circuit #2) is provided by the other unit's Reserve Auxiliary Transformers XR1 and XR2 through the train oriented 4.16 KV ESF bus crossties between the two units. In addition, an alternate offsite source of power for each unit would be, with the unit's main generator isophase bus links removed, each unit's Auxiliary Transformer XU1.

The DG must be capable of starting, accelerating to rated speed and voltage, connecting to its respective ESF bus on detection of bus undervoltage, and accepting required loads. This sequence must be accomplished within 10 seconds. The DG must 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 ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot, DG in standby at ambient conditions, and DG operating in a parallel test mode.

Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY. Load sequencing is accomplished through the programmed time load sequence interval utilizing individual timing relays for each load in lieu of a single "automatic load sequencer."

(continued)

BASES (continued)

LCO (continued)

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

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies within containment and during movement of fuel assemblies in the fuel storage pool provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;

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

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

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

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

The term fuel assembly includes irradiated fuel, non-irradiated fuel, and the dummy fuel assembly.

ACTIONS

A.1

An offsite circuit would be considered inoperable if it were not available to the required ESF train. Although one train is required by LCO 3.8.10 the remaining train with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and/or fuel movement. By the allowance of the option to declare inoperable the required features associated with the inoperable offsite circuit, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS.

(continued)

BASES (continued)

ACTIONS (continued)

A.2.1, A.2.2, A.2.3, A.2.4, A.2.5, B.1, B.2, B.3, B.4, and B.5

With the offsite circuit not available to the required train (Condition A), the option exists to declare all required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With the required DG inoperable (Condition B), the minimum required diversity of AC power sources is not available. It is, therefore, required to suspend CORE ALTERATIONS, suspend movement of ~~irradiated~~ fuel assemblies within containment, suspend movement of fuel assemblies in the fuel storage pool, and suspend operations involving positive reactivity additions that could result in loss of required SDM (Mode 5) or boron concentration (Mode 6). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability or 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 unit safety systems.

Notwithstanding performance of the conservative Required Actions, the unit is still without sufficient AC power sources to operate in a safe manner. Therefore, action must be initiated to restore the minimum required AC power sources and continue until the LCO requirements are restored.

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

(continued)

BASES (continued)

ACTIONS

A.2.1, A.2.2, A.2.3, A.2.4, A.2.5, B.1, B.2, B.3, B.4, and B.5 (continued)

Pursuant to LCO 3.0.6, the Distribution System's (LCO 3.8.10) ACTIONS are not entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A is entered with no AC power to one ESF bus, the ACTIONS for LCO 3.8.10 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite circuit, whether or not a train is de-energized. LCO 3.8.10 provides the appropriate restrictions for the situation involving a de-energized train.

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, 3, and 4. SR 3.8.1.17 is not required to be met because the required OPERABLE DG is not required to undergo periods of being synchronized to the offsite circuit. SR 3.8.1.20 is excepted because starting independence is not required with DG(s) that are not required to be OPERABLE.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DG from being paralleled with the offsite power network or otherwise rendered inoperable. With limited AC Sources available, a single event could unnecessarily compromise both the required circuit and the DG. The SRs listed in the Note are not required to be performed for the OPERABLE AC sources during Modes 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies within containment, and during movement of fuel assemblies in the ~~fuel~~ storage pool. However, these AC sources are presumed to be able to meet these surveillances. If it is discovered (through analysis or unplanned events, for example) that the required AC sources could not meet these surveillances, then the equipment must be considered inoperable. Refer to the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

REFERENCES

1. UFSAR, Chapter 15.

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." When TS 3.8.5 applies, there are two exceptions to what is described in the Bases for LCO 3.8.4:

1. One or both train(s) of the DC subsystem buses may be cross-tied to an 1800 amp-hour rated battery. This alignment allows both subsystems to remain OPERABLE. There is no time limit to the duration DC subsystem buses may be cross-tied with the unit shutdown.

2. With same train DC buses cross connected, an OPERABLE charger or chargers with a combined rated capacity greater than or equal to 300 Amps is required. A "required battery charger" is one of the following:

- the "dedicated charger" aligned to its respective DC bus
- the "swing battery charger" aligned to the respective DC bus
- one "dedicated charger" aligned to cross-tied DC buses, or
- the "swing battery charger" aligned to cross-tied DC buses.

Note: It is acceptable to have the swing charger and one dedicated charger aligned to cross-connected buses.

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume that Engineered Safety Feature (ESF) systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation.

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

The OPERABILITY of the minimum DC electrical power sources during MODES 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies within containment, and during movement of fuel assemblies in the fuel storage pool ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

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 a fuel handling accident.

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

LCO

Each DC electrical power subsystem, consisting of one battery (cross connection allowed), the required battery charger, and the corresponding control equipment and interconnecting cabling supplying power to the associated bus, is required to be OPERABLE to support distribution systems required OPERABLE by LCO 3.8.10, "Distribution Systems – Shutdown." This ensures the availability of sufficient DC electrical power sources to maintain the unit in a safe shutdown condition and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

APPLICABILITY

The DC electrical power sources required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies within containment, and during movement of fuel assemblies in the fuel storage pool provide assurance that:

a. Required features to mitigate a fuel handling accident are available;

b. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

c. 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, 3, and 4 are covered in LCO 3.8.4.

The term fuel assembly includes irradiated fuel, non-irradiated fuel, and the dummy fuel assembly.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since ~~irradiated~~ fuel assembly movement can occur in MODE 1, 2, 3, or 4, 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 5 or 6, LCO 3.0.3 would not specify

(continued)

BASES

ACTIONS (continued)

any action. If moving ~~irradiated~~ fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3 or 4 would require the unit to be shutdown unnecessarily. Conditions A and B represent one train with one or two required battery chargers or associated control equipment or cabling inoperable (e.g., the battery voltage limit of SR 3.8.4.1 is not maintained). The ACTIONS provide a tiered response that focuses on returning the battery to the fully charged state and restoring the required charger(s) to OPERABLE status in a reasonable time period.

A.1, A.2, and A.3 (A.3.1 or A.3.2.1 and A.3.2.2)

Condition A is modified by a NOTE identifying that it is only applicable to 1800 amp-hour rated batteries.

Required Action A.1 requires that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage (? 129.0 V) within 2 hours. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. Restoring the battery terminal voltage to greater than or equal to minimum established float voltage provides good assurance that, within 12 hours, the battery will be restored to its fully charged condition (Required Action A.2) from any discharge that might have occurred due to the charger inoperability. A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus, there is good assurance of fully recharging the battery within 12 hours, avoiding a shutdown of refueling activities.

If established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 2 hours, and the charger is not operating in the current limiting mode, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit mode that is necessary during the recovery period following a battery discharge event that the DC system is designed for.

(continued)

BASES

ACTIONS

A.1, A.2, and A.3 (A.3.1 or A.3.2.1 and A.3.2.2) (continued)

The charger operating in the current limit mode in excess of 2 hours is an indication that the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be fully recharged within 12 hours (Required Action A.2).

Required Action A.2 requires that the battery float current be verified as less than or equal to 21.50 amps. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it is now fully capable to supply the maximum expected load requirement. The battery manufacturer certified that at 1.50 amps the battery is at least 98% charged. A 2% capacity margin (correction factor) has been used in the battery sizing calculation (Ref. 3) which ensures that the battery has sufficient capacity to meet the maximum expected load demand. If at the expiration of the initial 12 hour period the battery float current is not less than or equal to 1.50 amps this indicates there may be additional battery problems and the battery must be declared inoperable.

A digital multimeter of high accuracy in an average function mode is required to measure the steady state float charging current (Ref. 4). The multimeter must be capable of measuring the low magnitude of DC current (less than 1.50 amps) and filtering the induced AC noise from the connected inverter. A millivolt shunt located close to the battery terminal provides the battery float charging current signal.

Required Action A.3 (A.3.1 or A.3.2.1 and A.3.2.2) is applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used (e.g., balance of plant non-Class 1E spare battery charger).

Required Action A.3.1 limits the restoration time for the required battery charger to 72 hours if a non-1E charger with a non-1E power source is used. The restoration time for the battery charger can be extended to 7 days (required Action A.3.2.2) if the ability to power the spare battery charger from a diesel-backed source has been established within 72 hours (Required Action A.3.2.1). All preparations to accomplish the ability to power the spare battery charger must be complete within 72 hours. The purpose of this

(continued)

BASES

ACTIONS

A.1, A.2, and A.3 (A.3.1 or A.3.2.1 and A.3.2.2) (continued)

provision is to facilitate connection of the spare battery charger to a diesel-backed source in ≤ 4 hours if non-1E power is lost. The 4-hour charger connection time is required because 4 hours after the loss of non-1E power, the battery may not supply the minimum required voltage at the loads. The 7-day completion time reflects a reasonable time to effect restoration of the required battery charger to operable status.

B.1, B.2, and B.3 (B.3.1 or B.3.2.1 and B.3.2.2)

Condition B is modified by a NOTE identifying that it is only applicable to 1260 amp-hour rated batteries.

Required Action B.1 basis is the same as A.1.

Required Action B.2 requires that the battery float current be verified to be less than or equal to 0.75 amp. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it is now fully capable to supply the maximum expected load requirement. The battery manufacturer certified that at 0.75 amp the battery is at least 98% charged. A 2% capacity margin (correction factor) has been used in the battery sizing calculation (Ref. 3) which ensures that the battery has sufficient capacity to meet the maximum expected load demand. If at the expiration of the initial 12 hour period the battery float current is not less than or equal to 0.75 amp this indicates there may be additional battery problems and the battery must be declared inoperable.

A digital multimeter of high accuracy in an average function mode is required to measure the steady state float charging current (Ref. 4). The multimeter must be capable of measuring the low magnitude of DC current (less than 0.75 amp) and filtering the indicated AC noise from the connected inverter. A millivolt shunt located close to the battery terminal provides the battery float charging current signal.

Required Action B.3 (B.3.1 or B.3.2.1 and B.3.2.2) basis is the same as A.3 (A.3.1 or A.3.2.1 and A.3.2.2).

(continued)

BASES

ACTIONS (continued)

C.1

With the required DC electrical power subsystem battery charger or associated control equipment or cabling outside the allowances of the Required Actions for Condition A or B, sufficient capacity to supply the maximum expected load requirement is not assured and the associated DC battery must be declared inoperable immediately.

D.1, or D.2.1, D.2.2, D.2.3, D.2.4, and D.2.5

Condition D represents one DC electrical power subsystem inoperable for reasons other than Condition A or B including when a battery is inoperable (Condition C). The ACTIONS provide a tiered response allowing the option to declare required features inoperable immediately with the associated DC power source(s) inoperable.

If two trains are required per LCO 3.8.10, the remaining train with DC power available may be capable of supporting sufficient systems to allow continuation of CORE ALTERATIONS and fuel movement. By allowing the option to declare required features inoperable with the associated DC power source(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCO 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, and suspend movement of ~~irradiated~~ fuel assemblies within containment, and suspend movement of fuel assemblies in the fuel storage pool, and suspend operations involving positive reactivity additions). The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory, provided the required SDM is maintained.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize 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 unit safety systems.

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

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

SR 3.8.5.1 states that Surveillances required by SR 3.8.4.1 through SR 3.8.4.34 are applicable in these MODES. See the corresponding Bases for LCO 3.8.4 for a discussion of each SR.

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

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. SCE Calculation E4C-017.
4. Response to Request for Additional Information on Battery and DC Sources Upgrades dated November 14, 2008.

(continued)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.8 Inverters – Shutdown

BASES

BACKGROUND

A description of the inverters is provided in the Bases for LCO 3.8.7, "Inverters – Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safety Feature systems are OPERABLE. The DC to AC inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the Reactor Protective System and Engineered Safety Features Actuation System instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

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

The OPERABILITY of the minimum inverters to each AC vital bus during MODES 5 and 6 ensures that:

a. The unit 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 available to mitigate events postulated during shutdown, such as a fuel handling accident.

The inverters were previously identified as part of the distribution system and, as such, satisfy Criterion 3 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO

The required inverters ensure the availability of electrical power for the instrumentation for systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. The battery powered inverters provide uninterruptible supply of AC electrical power to the AC vital buses even if the 4.16 kV safety buses are de-energized. OPERABILITY of at least two of the four inverters and the associated vital buses is required. This ensures the availability of sufficient inverter 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).

APPLICABILITY

The inverters required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies within containment and during movement of fuel assemblies in the fuel storage pool provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;

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.

Inverter requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.7.

The term fuel assembly includes irradiated fuel, non-irradiated fuel, and the dummy fuel assembly.

ACTIONS

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

If two trains of 120 VAC Vital Buses are required by LCO 3.8.10, "Distribution Systems – Shutdown," the remaining OPERABLE inverters may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS, fuel movement, and operations with a potential for positive

(continued)

BASES (continued)

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

reactivity additions that could result in loss of required SDM (Mode 5) or boron concentration (Mode 6). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM. By the allowance of the option to declare required features inoperable with the associated inverter(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCOs' 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, and suspend movement of ~~irradiated~~ fuel assemblies within containment, and suspend movement of fuel assemblies in the fuel storage pool, and suspend operations involving positive reactivity additions).

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 inverters and to continue this action until restoration is accomplished in order to provide the necessary inverter power to the unit safety systems.

Notwithstanding performance of the above conservative Required Actions, the unit is still without sufficient AC vital power sources to operate in a safe manner. Therefore, action must be initiated to restore the minimum required AC vital power source and continue until the LCO requirements are restored.

(continued)

BASES (continued)

ACTIONS

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

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required inverters should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power or powered from a constant voltage source transformer.

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and AC vital buses energized from the inverter. The verification of proper voltage output ensures that the required power is readily available for the instrumentation connected to the AC vital buses. The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.10 Distribution Systems – Shutdown

BASES

BACKGROUND

A description of the AC, DC, and AC vital bus electrical power distribution systems is provided in the Bases for LCO 3.8.9, "Distribution Systems(Operating" and the Bases for LCO 3.8.5, "DC Sources – Shutdown."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safety Feature (ESF) systems are OPERABLE. The AC, DC, and AC vital bus 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 systems and AC vital buses 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 distribution systems, and AC vital buses during MODES 5 and 6 ensures that:

a. The unit 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 a fuel handling accident.

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

(continued)

BASES (continued)

LCO

Various combinations of electrical distribution systems, equipment, and components are required OPERABLE by other LCOs, depending on the specific unit 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 required systems, equipment and components(all specifically addressed in each LCO and implicitly required via the definition of OPERABILITY.

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

APPLICABILITY

The AC and DC electrical power distribution systems required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of ~~irradiated~~ fuel assemblies within containment, and during movement of fuel assemblies in the fuel storage pool provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;

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 and refueling condition.

The AC, and DC electrical power distribution systems, and AC vital buses requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.9.

The term fuel assembly includes irradiated fuel, non-irradiated fuel, and the dummy fuel assembly.

(continued)

BASES (continued)

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, A.2.4, A.2.5, and A.2.6

Although redundant required features may require redundant trains of electrical power distribution subsystems to be OPERABLE, one OPERABLE distribution system may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and fuel movement. 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 systems 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, and suspend movement of ~~irradiated~~ fuel assemblies within containment, and suspend movement of fuel assemblies in the fuel storage pool, and suspend operations involving positive reactivity additions that could result in loss of required SDM (Mode 5) or boron concentration (Mode 6)). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

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 systems and to continue this action until restoration is accomplished in order to provide the necessary power to the unit safety systems.

Notwithstanding performance of the above conservative Required Actions, a required shutdown cooling (SDC) system may be inoperable. In this case, these Required Actions of Condition A do not adequately address the concerns relating to coolant circulation and heat removal. Pursuant to LCO 3.0.6, the SDC ACTIONS would not be entered.

(continued)

BASES (continued)

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, A.2.4, A.2.5, and A.2.6 (continued)

Therefore, the Required Actions of Condition A direct declaring SDC inoperable, which results in taking the appropriate SDC actions.

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

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

This Surveillance verifies that the AC, DC, and AC vital bus electrical power distribution system is functioning properly, with all the required buses energized. The verification of proper voltage availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. The 7-day frequency takes into account the redundant capability of the electrical power distribution systems and other indications available in the control room that alert the operator to system malfunctions.

REFERENCES

1. UFSAR, Chapter 6.

2. UFSAR, Chapter 15.

(continued)

B 3.9 REFUELING OPERATIONS

B 3.9.3 Containment Penetrations

BASES

BACKGROUND

During CORE ALTERATIONS or movement of fuel assemblies within containment with irradiated fuel in containment, a release of fission product radioactivity within the containment will be restricted from escaping to the environment when the LCO requirements are met. In MODES 1, 2, 3, and 4, this is accomplished by maintaining containment OPERABLE as described in LCO 3.6.1, "Containment." In MODE 6, the potential for containment pressurization as a result of an accident is not likely; therefore, requirements to isolate the containment from the outside atmosphere can be less stringent. The LCO requirements are referred to as "containment closure" rather than "containment OPERABILITY." Containment closure means that all potential escape paths are closed or capable of being closed. Since there is no potential for containment pressurization, the Appendix J, Option B leakage criteria and tests are not required.

The containment serves to contain fission product radioactivity that may be released from the reactor core following an accident, such that offsite radiation exposures are maintained well within the requirements of 10 CFR 100. Additionally, the containment structure provides radiation shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment equipment hatch, which is part of the containment pressure boundary, provides a means for moving large equipment and components into and out of containment. During CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies within containment, the equipment hatch must be held in place by at least four bolts. Good engineering practice dictates that the bolts required by this LCO be approximately equally spaced.

The containment air locks, which are also part of the containment pressure boundary, provide a means for personnel access during MODES 1, 2, 3, and 4 operation in accordance with LCO 3.6.2, "Containment Air Locks." Each air lock has a door at both ends. The doors are normally interlocked to prevent simultaneous opening when containment OPERABILITY is required. During periods of shutdown when containment

(continued)

BASES (continued)

BACKGROUND (continued)

closure is not required, the door interlock mechanism may be disabled, allowing both doors of an air lock to remain open for extended periods when frequent containment entry is necessary. During CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies within containment, containment closure is required; therefore, the door interlock mechanism may remain disabled, but one air lock door must always remain closed or operable. Operability of the containment personnel airlock door requires that the door is capable of being closed; that the door is unblocked and no cables or hoses are being run through the airlock; and that a designated individual is continuously available to close the airlock door. This individual must be stationed at the outer airlock door.

The use of temporary ramps for equipment access through the containment personnel air lock doors is acceptable during CORE ALTERATIONS or moving of ~~irradiated~~ fuel within containment. These ramps do not impede closure of the containment personnel airlock doors as the ramps are quickly removed by the designated individual stationed at the outer door. Removal of the ramps is a normal function of door closure, and the ability of plant personnel to close the personnel airlock, if needed, is not compromised by the ramps. Similarly, door seal covers may be used, provided they are removed prior to air lock door closure.

Except the systems that are closed inside of containment, systems conducting a fluid in and/or out of containment can also satisfy LCO 3.9.3 in either of the following configurations:

a. Systems containing devices inside containment which would preclude free air flow from containment such as self-closing quick disconnects, relief valves venting to containment, check valve(s), five foot water seal (periodic seal verification required), reciprocating pump, pipe cap, or any other equivalent device which would preclude free air flow out of containment.

b. Systems containing devices outside containment which would preclude free air flow from containment such as a reciprocating air compressor, compressed gas cylinder, or any of the devices listed in "a" above.

(continued)

BASES (continued)

BACKGROUND (continued)

These closure devices and lines connecting them to containment should be nonflammable and are not subject to Local Leak Rate Testing. Small bore tubing and flexible lines need not be seismically supported but should be protected from damage which could affect Containment Closure.

The routing of temporary services, such as breathing air through opened penetrations during fuel movement is permissible if the following conditions are established:

a. The area surrounding the service passing through the containment wall shall be sealed. This criteria may be met by using an existing pipe or cable penetration or by providing a method of sealing around the service pipe, hose or cable at the containment wall such that there can be no free passage of air between the containment atmosphere and the outside atmosphere.

b. If the service carries a liquid or gas, at least one end shall be closed such that there can be no free passage of air through the service hose or pipe between the containment atmosphere and the outside atmosphere. This requirement shall be able to be met even if pressure or flow is lost in the service system.

Check valves serving these lines prevent backflow from the containment atmosphere to the outside atmosphere.

Procedures for fulfilling proposed SURVEILLANCE REQUIREMENT 3.9.3.1 should contain provisions for identifying temporary services penetrating containment, and for determining that such penetrations satisfy the above criteria prior to fuel movement and periodically during fuel movement.

The requirements on containment penetration closure ensure that a release of fission product radioactivity within containment will be restricted from escaping to the environment.

The Containment Purge System includes two subsystems. The normal subsystem includes a 42 inch purge penetration and a 42 inch exhaust penetration. The second subsystem, a minipurge system, includes an 8 inch purge penetration and

(continued)

BASES (continued)

BACKGROUND (continued)

an 8 inch exhaust penetration. During MODES 1, 2, 3, and 4, the two valves in each of the normal purge and exhaust penetrations are secured in the closed position. The two valves in each of the two minipurge penetrations can be opened intermittently, but are closed automatically by the Containment Purge Isolation Signal (CPIS). Neither of the subsystems is subject to a Specification in MODE 5.

In MODE 6, large air exchanges are necessary to conduct refueling operations. The normal 42 inch purge system is used for this purpose and all valves are closed by the CPIS in accordance with LCO 3.3.8, "Containment Purge Isolation Signal (CPIS)."

The minipurge system is not normally used in MODE 6 with all four 8 inch valves in the closed position. However, as an alternative to normal purge, the minipurge system may be used in MODE 6 with CPIS operable.

The other containment penetrations that provide direct access from containment atmosphere to outside atmosphere must be isolated on at least one side. Isolation may be achieved by an OPERABLE automatic isolation valve, or by a manual isolation valve, blind flange, or equivalent. Equivalent isolation methods must be approved and may include use of a material that can provide a temporary atmospheric pressure ventilation barrier for the other containment penetrations during fuel movements.

APPLICABLE SAFETY ANALYSIS

During CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies within containment, the most severe radiological consequences result from a fuel handling accident. The fuel handling accident is a postulated event that involves damage to irradiated fuel (Ref. 1). Fuel handling accidents include dropping a single ~~irradiated~~ fuel assembly and handling tool or a heavy object onto ~~other~~ irradiated fuel assemblies. The requirements of LCO 3.9.6, "Refueling Water Level," and the minimum decay time of 72 hours prior to CORE ALTERATIONS ensure that the release of fission product radioactivity, subsequent to a fuel handling accident, results in doses that are well within the guideline values specified in 10 CFR 100.

Containment penetrations satisfy Criterion 3 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO

This LCO limits the consequences of a fuel handling accident in containment by limiting the potential escape paths for fission product radioactivity released within containment. The LCO requires any penetration providing direct access from the containment atmosphere to the outside atmosphere to be closed except for the OPERABLE containment purge and exhaust penetrations and the containment personnel airlock.

For the containment personnel airlock, this LCO ensures that the airlock can be closed after containment evacuation in the event of a fuel handling accident. The requirement that the plant be in Mode 6 with 23 feet of water above the fuel in the reactor vessel or defueled configuration with fuel in the containment (i.e., fuel in the refueling machine or upender) ensures that there is sufficient time to close the personnel airlock following a loss of shutdown cooling before boiling occurs.

LCO part a. is modified by a NOTE:

----------NOTE----------
The equipment hatch may be open if all of the following conditions are met:

1) The Containment Structure Equipment Hatch Shield Doors are capable of being closed within 30 minutes,
2) The plant is in Mode 6 with at least 23 feet of water above the reactor vessel flange,
3) A designated crew is available to close the Containment Structure Equipment Hatch Shield Doors,
4) Containment purge is in service, and
5) The reactor has been subcritical for at least 72 hours.

These restrictions include the administrative controls to allow the opening of the containment equipment hatch during CORE ALTERATIONS or movement of ~~irradiated~~ fuel in the containment provided that 1) The Containment Structure Equipment Hatch Shield Doors are capable of being closed within 30 minutes, 2) The plant is in Mode 6 with at least 23 feet of water above the reactor vessel flange, 3) A designated crew is available to close the Containment Structure Equipment Hatch Shield Doors, 4) Containment purge is in service, and 5) The reactor shall be subcritical for at least 72 hours. The Containment Structure Equipment Hatch Shield Doors include flashing on the top and sides of the shield doors which act to retard or restrict a release of post-accident fission products. The capability to close the containment shield doors includes requirements that the doors are capable of being closed and that any cables or hoses across the opening have quick disconnects to ensure the doors are capable of being closed within 30 minutes.

(continued)

BASES (continued)

LCO (continued)

The 30 minute closure time for the containment shield doors is considered to start when the control room communicates the need to shut the Containment Structure Equipment Hatch Shield Doors. This 30-minute requirement is significantly less than the fuel handling accident analysis assumption that the containment remains open to the outside environment for a two-hour period subsequent to the accident. Placing containment purge (i.e., main purge exhaust with or without supply) in service will ensure any release from containment will be monitored.

The administrative controls will also specify the responsibility to be able to communicate with the control room, and specify the responsibility to ensure that the containment shield doors are capable of being closed in the event of a fuel handling accident. These administrative controls will ensure containment closure would be established in the event of a fuel handling accident inside containment.

LCO part b. is modified by a NOTE which allows both doors of the containment airlock to be open provided:

a. one personnel airlock door is OPERABLE, and

b.1 the plant is in MODE 6 with 23 feet of water above the fuel in the reactor vessel, or

b.2 defueled configuration with fuel in containment (i.e., fuel in refueling machine or upender).

The OPERABILITY requirements ensure that the airlock door is capable of performing its function, and that a designated individual located outside of the affected area is available to close the door. For the OPERABLE containment purge and exhaust penetrations, this LCO ensures that these penetrations are isolable by the Containment Purge Isolation System. The OPERABILITY requirements for this LCO ensure that the automatic purge and exhaust valve closure times specified in the UFSAR can be achieved and therefore meet the assumptions used in the safety analysis to ensure releases through the valves are terminated, such that the radiological doses are within the acceptance limit.

APPLICABILITY

The containment penetration requirements are applicable during CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies (i.e., irradiated fuel, non-irradiated fuel, and the dummy fuel assembly) within containment because this is when there is a potential for a fuel handling accident. In MODES 1, 2, 3,

(continued)

BASES (continued)

APPLICABILITY (continued)

and 4, containment penetration requirements are addressed by LCO 3.6.1, "Containment." In MODES 5 and 6, when CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies within containment are not being conducted, the potential for a fuel handling accident does not exist. Therefore, under these conditions no requirements are placed on containment penetration status

ACTIONS

A.1 and A.2

With the containment equipment hatch, air locks, or any containment penetration that provides direct access from the containment atmosphere to the outside atmosphere not in the required status, including the Containment Purge Isolation System not capable of automatic actuation when the purge and exhaust valves are open, the unit must be placed in a condition in which the isolation function is not needed.

This is accomplished by immediately suspending CORE ALTERATIONS and movement of ~~irradiated~~ fuel assemblies within containment. Performance of these actions shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

This Surveillance demonstrates that each of the containment penetrations required to be in its closed position is in that position. The Surveillance on the open purge and exhaust valves will demonstrate that the valves are not blocked from closing. Also, the Surveillance will demonstrate that each valve operator has motive power, which will ensure each valve is capable of being closed by an OPERABLE automatic Containment Purge Isolation Signal (CPIS).

The Surveillance is performed every 7 days during CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies within the containment. As such, this Surveillance ensures that a postulated fuel handling accident that releases fission product radioactivity within the containment will not result in a release of fission product radioactivity to the environment.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.3.2

This Surveillance demonstrates that each containment purge and exhaust valve actuates to its isolation position on an actual or simulated high radiation signal. The 24 month Frequency maintains consistency with other similar ESFAS instrumentation and valve testing requirements. In LCO 3.3.8, "Containment Purge Isolation Signal," the Containment Purge Isolation Signal requires a CHANNEL CHECK every 7 days and a CHANNEL FUNCTIONAL TEST every 92 days to ensure the channel OPERABILITY during refueling operations. Every 24 months a CHANNEL CALIBRATION is performed. The signal actuation response time is demonstrated every 24 months, during refueling, on a STAGGERED TEST BASIS. SR 3.6.3.5 demonstrates that the isolation time of each valve is in accordance with the Inservice Testing Program requirements. These surveillances will ensure that the valves are capable of closing after postulated fuel handling accident to limit a release of fission product radioactivity from the containment.

REFERENCE

1. NUREG-0712, Safety Evaluation Report related to the operation of San Onofre Nuclear Generating Station, Units 2 and 3, February 1981.

B 3.9 REFUELING OPERATIONS

B 3.9.6 Refueling Water Level

BASES

BACKGROUND

During movement of fuel assemblies or CEAs within the reactor pressure vessel ~~when either the fuel assemblies being moved or the fuel assemblies seated within the reactor pressure vessel are irradiated~~, and during movement of ~~irradiated~~ fuel assemblies within containment, a minimum water level of 23 ft above the top of the reactor vessel flange is required. During refueling this maintains sufficient water level in the refueling canal and the fuel transfer canal. Sufficient water is necessary to retain iodine fission product activity in the water in the event of a fuel handling accident (Refs. 1 and 2). Sufficient iodine activity is well within the guidelines of 10CFR 100.

APPLICABLE SAFETY ANALYSES

During movement of fuel assemblies (i.e., irradiated fuel, non-irradiated fuel, and the dummy fuel assembly) or CEAs within the reactor pressure vessel ~~when either the fuel assemblies being moved or the fuel assemblies seated within the reactor pressure vessel are irradiated~~, and during movement of ~~irradiated~~ fuel assemblies within containment, the water level in the refueling canal is an initial condition design parameter in the analysis of the fuel handling accident in containment postulated by Regulatory Guide 1.25 (Ref. 1). A minimum water level of 23 ft (Regulatory Position C.1.c of Ref. 1) allows a decontamination factor of 100 (Regulatory Position C.1.g of Ref. 1) to be used in the accident analysis for iodine. This relates to the assumption that 99% of the total iodine released from the pellet to cladding gap of all the dropped fuel assembly rods is retained by the refueling canal water. The fuel pellet to cladding gap is assumed to contain 10% of the total fuel rod iodine inventory (Ref. 1).

The fuel handling accident analysis inside containment is described in Reference 2. With a minimum water level of 23 ft and a minimum decay time of 72 hours prior to fuel handling, the analysis and test programs demonstrate that the iodine release due to a postulated fuel handling accident is adequately captured by the water and offsite doses are maintained within allowable limits (Ref. 4).

Refueling water level satisfies Criterion 2 of the NRC Policy Statement.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES (continued)

The applicability statement is modified by a note which allows that the water level may be lowered to a minimum of 23 feet above the top of the fuel for movement of four finger CEAs, coupling and uncoupling of CEA extension shafts or for verifying the coupling and uncoupling.

LCO

A minimum refueling water level of 23 ft above the reactor vessel flange is required to ensure that the radiological consequences of a postulated fuel handling accident inside containment are within acceptable limits as provided by the guidance of Reference 3.

APPLICABILITY

LCO 3.9.6 is applicable during movement of fuel assemblies or CEAs within the reactor pressure vessel ~~when either the fuel assemblies being moved or the fuel assemblies seated with the reactor pressure vessel are irradiated~~, and during movement of ~~irradiated~~ fuel assemblies within containment. A note provides an exception that the water level may be lowered to a minimum of 23 feet above the top of the fuel for movement of four finger CEAs, coupling and uncoupling of CEA extension shafts or for verifying the coupling and uncoupling. The LCO minimizes the possibility of a fuel handling accident in containment that is beyond the assumptions of the safety analysis. If irradiated fuel is not present in containment, there can be no significant radioactivity release as a result of a postulated fuel handling accident. Requirements for fuel handling accidents in the spent fuel pool are covered by LCO 3.7.16, "Fuel Storage Pool Water Level."

ACTIONS

A.1 and A.2

With a water level of < 23 ft above the top of the reactor vessel flange, all operations involving CORE ALTERATIONS or movement of ~~irradiated~~ fuel assemblies in containment shall be suspended immediately to ensure that a fuel handling accident cannot occur.

The suspension of CORE ALTERATIONS and fuel movement shall not preclude completion of movement of a component to a safe position.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

Verification of a minimum water level of 23 ft above the top of the reactor vessel flange ensures that the design basis for the postulated fuel handling accident analysis during refueling operations is met. Water at the required level above the top of the reactor vessel flange limits the consequences of damaged fuel rods that are postulated to result from a fuel handling accident inside containment (Ref. 2).

The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls of valve positions, which make significant unplanned level changes unlikely.

REFERENCES

1. Regulatory Guide 1.25, March 23, 1972.

2. UFSAR, Section 15.7.3.9.

3. NUREG-0712, Safety Evaluation Report related to the operation of San Onofre Nuclear Generating Station, Units 2 and 3, February 1981.

4. 10 CFR 100.10.

(continued)