NEXTera ENERGY SEABROOK

December 18, 2014

Docket No. 50-443
SBK-L-14231

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

Seabrook Station
Submittal of Changes to the Seabrook Station Technical Specification Bases

NextEra Energy Seabrook, LLC submits the enclosed changes to the Seabrook Station Technical Specification Bases. The changes were made in accordance with Technical Specification 6.7.6.j., "Technical Specification (TS) Bases Control Program." Please update the Technical Specification Bases in accordance with Enclosure 1.

Should you have any questions concerning this submittal, please contact me at (603) 773-7512.

Sincerely,

NextEra Energy Seabrook, LLC

Michael H. Ossing
Licensing Manager

cc: D. Dorman, NRC Region I Administrator
J. Lamb, NRC Project Manager, Project Directorate I-2
P. Cataldo, NRC Senior Resident Inspector

A001
NRR

Enclosure 1 to SBK-L-14231

Change Instructions for
Seabrook Station Technical Specification Bases
(Sheet 1 of 2)

REMOVE	INSERT
B 3/4 1-4	B 3/4 1-4
B 3/4 2-2	B 3/4 2-2
B 3/4 2-3	B 3/4 2-3
B 3/4 2-4	B 3/4 2-4
B 3/4 3-1	B 3/4 3-1
B 3/4 3-2	B 3/4 3-2
B 3/4 3-4	B 3/4 3-4
B 3/4 4-3	B 3/4 4-3
B 3/4 4-10d	B 3/4 4-10d
B 3/4 4-14	B 3/4 4-14
B 3/4 4-15	B 3/4 4-15
B 3/4 5-2a	B 3/4 5-2a
B 3/4 5-3	B 3/4 5-3
B 3/4 7-5	B 3/4 7-5
B 3/4 7-8	B 3/4 7-8
B 3/4 7-11	B 3/4 7-11
B 3/4 7-19	B 3/4 7-19
B 3/4 7-20	B 3/4 7-20
B 3/4 8-8	B 3/4 8-8
B 3/4 8-9	B 3/4 8-9
B 3/4 8-10	B 3/4 8-10
B 3/4 8-11	B 3/4 8-11

Change Instructions for
Seabrook Station Technical Specification Bases
(Sheet 2 of 2)

REMOVE	INSERT
B 3/4 8-12	B 3/4 8-12
B 3/4 8-13	B 3/4 8-13
B 3/4 8-14	B 3/4 8-14
B 3/4 8-15	B 3/4 8-15
B 3/4 8-16	B 3/4 8-16
B 3/4 8-17	B 3/4 8-17
B 3/4 8-19	B 3/4 8-19
B 3/4 8-20	B 3/4 8-20
B 3/4 8-23	B 3/4 8-23
B 3/4 9-2c	B 3/4 9-2c
B 3/4 9-4	B 3/4 9-4
B 3/4 9-5	B 3/4 9-5

Enclosure 2 to SBK-L-14231

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that: (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of rod misalignment on associated accident analyses are limited. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits. Verification that the Digital Rod Position Indicator agrees with the demanded position within ± 12 steps at 24, 48, 120, and 228 steps withdrawn for the Control Banks and 18, 210, and 228 steps withdrawn for the Shutdown Banks provides assurances that the Digital Rod Position Indicator is operating correctly over the full range of indication. Since the Digital Rod Position Indication System does not indicate the actual shutdown rod position between 18 steps and 210 steps, only points in the indicated ranges are picked for verification of agreement with demanded position.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors and a restriction in THERMAL POWER. These restrictions provide assurance of fuel rod integrity during continued operation. In addition, those safety analyses affected by a misaligned rod are reevaluated to confirm that the results remain valid during future operation.

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the safety analyses. Measurement with rods at their individual mechanical fully withdrawn position, T_{avg} greater than or equal to 551°F and all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a Reactor trip at operating conditions.

The fully withdrawn position of shutdown and control banks can be varied between 225 and the mechanical fully withdrawn position (up to 232 steps), inclusive. An engineering evaluation was performed to allow operation to the 232 step maximum. The 225 to 232 step interval allows axial repositioning to minimize RCCA wear.

Control rod positions and OPERABILITY of the rod position indicators are required to be verified in accordance with the Surveillance Frequency Control Program with more frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCOs are satisfied.

For Specification 3.1.3.1 ACTIONS b. and c., it is incumbent upon the plant to verify the trippability of the inoperable control rod(s). Trippability is defined in Attachment C to a letter dated December 21, 1984, from E. P. Rahe (Westinghouse) to C. 0. Thomas (NRC). This may be by verification of a control system failure, usually electrical in nature, or that the failure is associated with the control rod stepping mechanism. In the event the plant is unable to verify the rod(s) trippability, it must be assumed to be untrippable and thus falls under the requirements of ACTION a. Assuming a controlled shutdown from 100% RATED THERMAL POWER, this allows approximately 4 hours for this verification.

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR and NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor and nuclear enthalpy rise hot channel factor ensure that: (1) the design limits on peak local power density and minimum DNBR are not exceeded and (2) in the event of a LOCA, the peak fuel clad temperature will not exceed the 2200°F ECCS acceptance criteria limit.

Each of these is measurable but will normally only be determined periodically as specified in Specifications 4.2.2 and 4.2.3. This periodic surveillance in accordance with the Surveillance Frequency Control Program is sufficient to ensure that the limits are maintained provided:

a. Control rods in a single group move together with no individual rod insertion differing by more than ± 12 steps, indicated, from the group demand position;

b. Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.6;

c. The control rod insertion limits of Specifications 3.1.3.5 and 3.1.3.6 are maintained; and

d. The axial power distribution, expressed in terms of AXIAL FLUX DIFFERENCE, is maintained within the limits.

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR and NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR (Continued)

$F^N_{\Delta H}$ will be maintained within its limits provided Conditions a. through d. above are maintained. Margin is maintained between the safety analysis limit DNBR and the design limit DNBR. There is additional margin available to offset any other DNBR penalties and for plant design flexibility.

When an $F_Q(Z)$ measurement is taken, an allowance for both measurement error and manufacturing tolerance must be made. An allowance of 5% is appropriate for a full-core map taken with the movable incore detectors, while 5.21% is appropriate for surveillance results determined with the fixed incore detectors. A 3% allowance is appropriate for manufacturing tolerance.

The hot channel factor $F^M_Q(Z)$ is measured in accordance with the Surveillance Frequency Control Program and increased by a cycle and height dependent power factor appropriate to Relaxed Axial Offset Control (RAOC) operation, W(Z), to provide assurance that the limit on the hot channel factor $F_Q(Z)$ is met. W(Z) accounts for the effects of normal operation transients and was determined from expected power control maneuvers over the full range of burnup conditions in the core. The W(Z) function for normal operation is specified in the CORE OPERATING LIMITS REPORT per Specification 6.8.1.6.

When RCS $F^N_{\Delta H}$ is measured, no additional allowances are necessary prior to comparison with the established limit. Appropriate $F^N_{\Delta H}$ measurement uncertainties are already incorporated into the limits $F^N_{\Delta H}$ established in the CORE OPERATING LIMITS REPORT for each measurement system, and a bounding $F^N_{\Delta H}$ measurement uncertainty has been applied in determination of the design DNBR value. The appropriate $F^N_{\Delta H}$ measurement uncertainties are 4.13% for the fixed incore detector system and 4% for the movable incore detector system.

3/4.2.4 QUADRANT POWER TILT RATIO

The purpose of this specification is to detect gross changes in core power distribution between monthly Incore Detector System surveillances. During normal operation the QUADRANT POWER TILT RATIO is set equal to 1.0 once acceptability of core peaking factors has been established by review of incore surveillances. The limit of 1.02 is established as an indication that the power distribution has changed enough to warrant further investigation.

3/4.2.5 DNB PARAMETERS

The limits on the DNB-related parameters assure that each of the parameters is maintained within the normal steady-state envelope of operation assumed in the transient and accident analyses. The limits are consistent with the updated FSAR assumptions and have been analytically demonstrated adequate to assure compliance with acceptance criteria for each analyzed transient. Operating procedures include allowances for measurement and indication uncertainty so that the limits specified in the COLR for T_{avg} and for pressurizer pressure are not exceeded.

The periodic surveillance of these parameters through instrument readout is sufficient to ensure that the parameters are restored within their limits following load changes and other expected transient operation. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

The periodic surveillance of indicated RCS flow is sufficient to detect only flow degradation which could lead to operation outside the specified limit. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

RCS flow must be greater than or equal to, 1) the Thermal Design Flow (TDF) with an allowance for measurement uncertainty and, 2) the minimum measured flow used in place of the TDF in the analysis of the DNB related events when the Revised Thermal Design Procedure (RTDP) methodology is utilized. Measurement of RCS total flow rate is performed by performance of either a precision calorimetric heat balance or normalized cold leg elbow tap ΔP measurements. RCS flow measurements using either the precision heat balance or the elbow tap ΔP measurement methods are to be performed at steady state conditions prior to operation above 95% rated thermal power (RTP) at the beginning of a new fuel cycle. The elbow tap RCS flow measurement methodology is described in WCAP-15404, "Justification of Elbow Taps for RCS Flow Verification at Seabrook Station", dated April 2000.

3/4.3.1 and 3/4.3.2 REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

The OPERABILITY of the Reactor Trip System and the Engineered Safety Features Actuation System instrumentation and interlocks ensures that: (1) the associated ACTION and/or Reactor trip will be initiated when the parameter monitored by each channel or combination thereof reaches its Setpoint (2) the specified coincidence logic is maintained, (3) sufficient redundancy is maintained to permit a channel to be out-of-service for testing or maintenance, and (4) sufficient system functional capability is available from diverse parameters.

The OPERABILITY of these systems is required to provide the overall reliability, redundancy, and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the safety analyses. The Surveillance Requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed in accordance with the Surveillance Frequency Control Program are sufficient to demonstrate this capability.

Table 3.3-1 contains the action statements for inoperable Reactor Trip System Instrumentation. Actions 4 and 5, associated with the source range neutron flux instruments, each include a requirement to suspend operations involving positive reactivity changes. When complying with this action, operations that individually add limited, positive reactivity are acceptable when, combined with other actions that add negative reactivity, the overall net reactivity addition is zero or negative. For example, a positive reactivity addition caused by temperature fluctuations from inventory addition or temperature control fluctuations is acceptable if it is combined with a negative reactivity addition such that the overall, net reactivity addition is zero or negative.

3/4.3.1 and 3/4.3.2 REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION (continued)

uncertainties of the instrumentation to measure the process variable and the uncertainties in calibrating the instrumentation. In Equation 2.2-1, $Z + R\ S \leq TA$, the interactive effects of the errors in the rack and the sensor, and the "as measured" values of the errors are considered. Z, as specified in Table 3.3-4, in percent span, is the statistical summation of errors assumed in the analysis excluding those associated with the sensor and rack drift and the accuracy of their measurement. TA or Total Allowance is the difference, in percent span; R or Rack Error is the "as measured" deviation, in the percent span, for the affected channel from the specified Trip Setpoint. S or Sensor Error is either the "as measured" deviation of the sensor from its calibration point or the value specified in Table 3.3-4, in percent span, from the analysis assumptions. Use of Equation 2.2-1 allows for a sensor drift factor, an increased rack drift factor, and provides a threshold value for REPORTABLE EVENTS.

The methodology to derive the Trip Setpoints is based upon combining all of the uncertainties in the channels. Inherent to the determination of the Trip Setpoints are the magnitudes of these channel uncertainties. Sensor and rack instrumentation utilized in these channels are expected to be capable of operating within the allowances of these uncertainty magnitudes. Rack drift in excess of the Allowable Value exhibits the behavior that the rack has not met its allowance. Being that there is a small statistical chance that this will happen, an infrequent excessive drift is expected. Rack or sensor drift, in excess of the allowance that is more than occasional, may be indicative of more serious problems and should warrant further investigation.

The verification of response time in accordance with the Surveillance Frequency Control Program provides assurance that the reactor trip and the engineered safety features actuation associated with each channel is completed within the time limit assumed in the safety analysis. No credit is taken in the analysis for those channels with response times indicated as not applicable (i.e., N.A.).

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from:

(1) Historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests);

(2) Inplace, onsite, or offsite (e.g., vendor) test measurements; or

(3) Utilizing vendor engineering specifications.

MONITORING INSTRUMENTATION

3/4.3.3.1 RADIATION MONITORING FOR PLANT OPERATIONS (Continued)

and abnormal conditions. Once the required logic combination is completed, the system sends actuation signals to initiate alarms or automatic isolation action and actuation of Emergency Exhaust or Ventilation Systems.

3/4.3.3.2 (THIS SPECIFICATION NUMBER IS NOT USED)

3/4.3.3.3 (THIS SPECIFICATION NUMBER IS NOT USED)

3/4.3.3.4 (THIS SPECIFICATION NUMBER IS NOT USED)

3/4.3.3.5 REMOTE SHUTDOWN SYSTEM

The OPERABILITY of the Remote Shutdown System ensures that sufficient capability is available to permit safe shutdown of the facility from locations outside of the control room. This capability is required in the event control room habitability is lost and is consistent with General Design Criterion 19 of Appendix A to 10 CFR Part 50.

The OPERABILITY of the Remote Shutdown System ensures that a fire will not preclude achieving safe shutdown. The Remote Shutdown System instrumentation, control, and power circuits and transfer switches necessary to eliminate effects of the fire and allow operation of instrumentation, control and power circuits required to achieve and maintain a safe shutdown condition are independent of areas where a fire could damage systems normally used to shut down the reactor. This capability is consistent with General Design Criterion 3 and Appendix R to 10CFRPart 50.

The Technical Specifications (T/S) require surveillance testing of selected equipment used for safe shutdown from outside the control room at Remote Safe Shutdown (RSS) locations. The surveillance frequency is controlled under the Surveillance Frequency Control Program. The required equipment is listed in Table 3.3-9. The selection criteria for the Transfer Switch/Control Circuit portion of the table is the primary equipment which has remote/local selector switches and is required to perform the reactor coolant system inventory and pressure control, reactivity control, and decay heat removal functions to achieve and maintain hot standby. Redundant, safety grade equipment is provided for GDC 19 shutdown. For Appendix R shutdown, only one train of equipment (safety or non-safety related) is required; redundancy is not a requirement. Therefore, some equipment in Table 3.3-9 is required for a GDC 19 shutdown but not for a GDC 3/Appendix R shutdown. Seabrook is a hot standby safe shutdown design basis plant (see UFSAR Section 5.4.7.2.i). Support equipment, and equipment required only to achieve and maintain cold shutdown, are not required to be included in the T/S table.

3/4.4.3 PRESSURIZER

The limit on the maximum water volume in the pressurizer assures that the parameter is maintained within the normal steady-state envelope of operation assumed in the SAR. The limit is consistent with the initial SAR assumptions. The periodic surveillance is sufficient to ensure that the parameter is restored to within its limit following expected transient operation. The surveillance frequency is controlled under the Surveillance Frequency Control Program. The maximum water volume also ensures that a steam bubble is formed and thus the RCS is not a hydraulically solid system. The requirement that a minimum number of pressurizer heaters be OPERABLE enhances the capability of the plant to control Reactor Coolant System pressure and establish natural circulation.

3/4.4.4 RELIEF VALVES

The power-operated relief valves (PORVs) and steam bubble function to relieve RCS pressure during all design transients up to and including the design step load decrease with steam dump. Operation of the PORVs minimizes the undesirable opening of the spring-loaded pressurizer Code safety valves. Each PORV has a remotely operated block valve to provide a positive shutoff capability should a relief valve become inoperable. The PORVs and their associated block valves are powered from Class 1E power supply busses.

The PORVs are equipped with automatic actuation circuitry and manual control capability. The PORVs are considered OPERABLE in either the automatic or manual mode for the following reasons:

(1) No credit is taken in any FSAR accident analysis for automatic PORV actuation to mitigate the consequences of an accident.

(2) No Surveillance Requirement (ACOT or TADOT) exists for verifying automatic operation.

(3) The required ACTION for an inoperable PORV(s) (closing the block valve) conflicts with any presumed requirement for automatic actuation.

REACTOR COOLANT SYSTEM LEAKAGE

3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE

3/4.4.6.1 LEAKAGE DETECTION SYSTEMS

ACTIONS (c) (Continued)

The 12 hour interval is sufficient to detect increasing RCS leakage. The Action provides 7 days to restore another RCS leakage monitor to operable status to regain the intended leakage detection diversity. The 7 day restoration time ensures that the plant will not be operated in a degraded configuration for a lengthy time period. Two leakage detections systems must be restored to operable status within 30 days to meet the LCO or the plant must shutdown.

SURVEILLANCE REQUIREMENTS

SR 4.4.6.1.a.1

SR 4.4.6.1.a.1 requires the performance of a CHANNEL CHECK of the required containment atmosphere radioactivity monitor. The check gives reasonable confidence that the channel is operating properly. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

SR 4.4.6.1.a.2

SR 4.4.6.1.a.2 requires the performance of a digital channel operational test on the required containment atmosphere radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. The test verifies the alarm setpoint and relative accuracy of the instrument string. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

SR 4.4.6.1.a.3 and 4.4.6.1.b

These SRs require the performance of a channel calibration for each of the RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, Section IV, GDC 30.

2. Regulatory Guide 1.45, Revision 0, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973.

3. FSAR, Section 5.2.5.

REACTOR COOLANT SYSTEM LEAKAGE

3/4.4.6.2 OPERATIONAL LEAKAGE (Continued)

SURVEILLANCE REQUIREMENTS

4.4.6.2.1

Verifying RCS leakage to be within the LCO limits ensures the integrity of the RCPB is maintained. Pressure boundary leakage would at first appear as unidentified leakage and can only be positively identified by inspection. It should be noted that leakage past seals and gaskets is not pressure boundary leakage. Unidentified leakage and identified leakage are determined by performance of an RCS water inventory balance.

The RCS water inventory balance must be met with the reactor at steady state operating conditions (stable temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The surveillance is modified by two footnotes. Footnote 1 states that this SR is not applicable to primary to secondary leakage because leakage of 150 gallons per day cannot be measured accurately by an RCS water inventory balance. Footnote 2 states that this SR is not required to be performed until 12 hours after establishing steady state operation. The 12-hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established.

Steady state operation is required to perform a proper inventory balance since calculations during maneuvering are not useful. For RCS operational leakage determination by water inventory balance, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows.

An early warning of pressure boundary leakage or unidentified leakage is provided by the automatic systems that monitor the containment atmosphere radioactivity and the containment sump level. It should be noted that leakage past seals and gaskets is not pressure boundary leakage. These leakage detection systems are specified in LCO 3.4.6.1, "RCS Leakage Detection Instrumentation."

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

REACTOR COOLANT SYSTEM LEAKAGE

3/4.4.6.2 OPERATIONAL LEAKAGE (Continued)

SR 4.4.6.2.1.f verifies that primary to secondary leakage is less or equal to 150 gallons per day through any one SG. Satisfying the primary to secondary leakage limit ensures that the operational leakage performance criterion in the Steam Generator Program is met. If this SR is not met, compliance with LCO 3.4.5, "Steam Generator Tube Integrity," should be evaluated. The 150 gallons per day limit is measured at room temperature as described in Reference 5. The operational leakage rate limit applies to leakage through any one SG. If it is not practical to assign the leakage to an individual SG, the entire primary to secondary leakage should be conservatively assumed to be from one SG.

The Surveillance is modified by a footnote that states the Surveillance is not required to be performed until 12 hours after establishment of steady state operation. For RCS primary to secondary leakage determination, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows.

The surveillance frequency is controlled under the Surveillance Frequency Control Program. The primary to secondary leakage is determined using continuous process radiation monitors or radiochemical grab sampling in accordance with the EPRI guidelines (Ref. 5).

4.4.6.2.2

The Surveillance Requirements for RCS pressure isolation valves provide added assurance of valve integrity thereby reducing the probability of gross valve failure and consequent intersystem LOCA. RCS Pressure Isolation Valve (PIV) Leakage measures leakage through each individual PIV and can impact this LCO. Of the two PIVs in series in each isolated line, leakage measured through one PIV does not result in RCS leakage when the other is leak tight. If both valves leak and result in a loss of mass from the RCS, the loss must be included in the allowable IDENTIFIED LEAKAGE.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 30.
2. Regulatory Guide 1.45, May 1973.
3. FSAR, Section 15.
4. NEI 97-06, "Steam Generator Program Guidelines."
5. EPRI, "Pressurized Water Reactor Primary-to Secondary Leak Guidelines."

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS (Continued)

An automatic valve may be aligned in other than its accident position provided (1) the valve receives an automatic signal to re-position to its required position in the event of an accident, and (2) the valve is otherwise operable (stroke time within limits, motive force available to re-position the valve, control circuitry energized, and mechanically capable of re-positioning).

With the exception of the operating centrifugal charging pump, the ECCS pumps are normally in a standby, non-operating mode. As such, flow path piping has the potential to develop voids and pockets of entrained gases. Maintaining the piping from the refueling water storage tank (RWST) and from the ECCS recirculation sump to the RCS full of water (by verifying at the accessible ECCS piping high points and pump casings, excluding the operating centrifugal charging pump) ensures that the system will perform properly, injecting its full capacity into the RCS upon demand. This will also prevent water hammer, pump cavitation, and pumping of non-condensable gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following a safety injection (SI) signal or during shutdown cooling. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

It should be noted that Surveillance Requirement 4.5.2b.1 Bases also

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS (Continued)

conditions the Surveillance Requirement by stating that verification is to be performed at the "accessible" ECCS piping high points and pump casing, excluding the operating centrifugal charging pump. Thus, the Bases recognizes that certain "impracticalities," i.e., physical accessibility issues or the operating centrifugal charging pump (only) under dynamic conditions, may preclude verification at certain points and as such provides relief. However, such relief cannot be taken at the expense of possible system inoperability because of lack of periodic verification. Such relief can only be taken if there is reasonable assurance that the collection of gasses or void formation is of no significant concern at the points not to be verified periodically within the surveillance interval. Furthermore, because of regulatory requirements, even if reasonable assurance can be justified for not requiring verification at a particular high point, such verification must be performed if the high point is accessible. "Inaccessibility" cannot be used as a mere convenience.

ECCS piping high points may be considered inaccessible if any of the following criteria are met:

a) The high point is located inside the bioshield in containment while the reactor is critical (Modes 1 & 2), since this area can contain lethal radiation fields during reactor operation. During those situations when the reactor is not critical, other conditions where gaining access poses a safety or radiological hazard (e.g., high system temperature, high radiological conditions) may prohibit verification by UT/venting.

b) The high point is located in an area where gaining access poses a safety or radiological hazard, e.g.:

- Installation/removal of temporary ladders within containment or other areas where stay times (heat stress / high radiation levels) or other factors must be kept to minimums.

Note: The safety or radiological concern should be documented for further evaluation by the responsible organization(s).

c) High points within heat exchanger tubes.

The phrase "full of water" is subjective particularly since most system fluid streams do contain a certain amount of non-condensable gasses. ECCS piping may be considered "full of water" if there is reasonable assurance that the content of the non-condensable gas within the system (including the aggregate amount of non-condensable gasses in all ECCS piping) and at a particular point will not be of significance to impair the ECCS system from performing

3/4.7.1 TURBINE CYCLE (Continued)

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEM (Continued)

ACTIONS

Note 1 prohibits the application of LCO 3.0.4.b to an inoperable EFW train when entering MODE 1, and Note 2 prohibits the application of LCO 3.0.4.b to an inoperable startup feedwater pump. There is an increased risk associated with entering MODE 1 with AFW inoperable, or entering MODES 3 or 2 with the startup feedwater pump inoperable. The provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

With one AFW pump inoperable, the action provides a 72-hour AOT for restoring the pump to an operable status before requiring a plant shutdown. This time is reasonable based on the availability of redundant equipment and the low probability of an accident occurring during this time. Additional actions with more limiting AOTs apply to conditions involving more than one inoperable AFW pump. In the event that all AFW pumps are inoperable, the plant is in a seriously degraded condition. Consequently, the plant should not be perturbed by any action, including a power change, that might result in a plant trip and demand on the EFW system. The seriousness of this condition requires immediately initiating corrective action to restore at least one AFW pump to operable status as soon as possible.

SURVEILLANCES

Various surveillance requirements, with frequencies in accordance with the Surveillance Frequency Control Program, demonstrate the operability of the AFW system. Each non-automatic valve in the flow path that is not locked, sealed, or otherwise secured, is verified in its correct position. This verification includes only those valves in the direct flow path through safety-related equipment whose position is critical to the proper functioning of the safety-related equipment. Vents, drains, sampling connections, instrument taps, etc., that are not directly in the flow path and are not critical to proper functioning of the safety-related equipment are excluded from this surveillance requirement.

Testing of the steam-driven EFW pump is exempt from the provisions of TS 4.0.4 for entry into MODE 3. This allowance is necessary because the surveillance testing, which requires a minimum steam pressure of 500 psig, cannot be performed until the plant reaches MODE 3. Once steam pressure reaches 500 psig, administrative controls establish a 24-hour time limit for completing the testing consistent with Specification 4.0.4.

3/4.7.1 TURBINE CYCLE (Continued)

3/4.7.1.4 SPECIFIC ACTIVITY (Continued)

SURVEILLANCE REQUIREMENTS (SR)

SR 4.7.1.4

This SR verifies that the secondary specific activity is within the limits of the accident analysis. A gamma isotopic analysis of the secondary coolant, which determines DOSE EQUIVALENT I-131, confirms the validity of the safety analysis assumptions as to the source terms in post accident releases. It also serves to identify and trend any unusual isotopic concentrations that might indicate changes in reactor coolant activity or LEAKAGE. The surveillance frequency is controlled under the Surveillance Frequency Control Program. |

REFERENCES

1. 10 CFR 50.67.
2. UFSAR, Chapter 15.

3/4.7.1.5 MAIN STEAM LINE ISOLATION VALVES

The OPERABILITY of the main steam line isolation valves ensures that no more than one steam generator will blow down in the event of a steam line rupture. This restriction is required to: (1) minimize the positive reactivity effects of the Reactor Coolant System cooldown associated with the blowdown, and (2) limit the pressure rise within containment in the event the steam line rupture occurs within containment. The OPERABILITY of the main steam isolation valves within the closure times of the Surveillance Requirements are consistent with the assumptions used in the safety analyses.

3/4.7.1.6 ATMOSPHERIC RELIEF VALVES

The OPERABILITY of the Atmospheric Relief Valves (ARVs) ensures the controlled removal of reactor decay heat during reactor cooldown, plant startup, and after a turbine trip, when the condenser and/or the turbine bypass system are not available. When available, the ARVs can be used to reduce main steam pressure for both hot shutdown and cold shutdown conditions. The ARVs provide a method for cooling the plant to residual heat removal entry conditions should the turbine bypass system to the condenser be unavailable. This is done in conjunction with the Auxiliary Feedwater System providing cooling water from the condensate storage tank (CST).

3/4.7.4 SERVICE WATER SYSTEM/ULTIMATE HEAT SINK (Continued)

The portable makeup pump must have a minimum capacity of 200 gpm, which ensures the capability to meet the calculated makeup requirement of 140 gpm at seven days after a LOCA. A surveillance requirement verifies the ability of the pump to produce flow of at least 200 gpm in accordance with the Surveillance Frequency Control Program. In addition, an inventory and periodic inspections of the hose confirm the availability and integrity of sufficient flexible hose.

The seven-day period during which the cooling tower can operate without makeup water provides adequate time to move the portable pump into position, lay the hose, and make the system ready for operation. As a result, the portable pump is not necessarily immediately available for operation when stored in its design operational readiness state. The seven-day period allows ample time to charge the battery, obtain diesel fuel, inflate the trailer tires, and obtain a tow vehicle.

Switchover from the service water pumphouse to the mechanical draft cooling tower is accomplished either automatically (Tower Actuation (TA) signal) or manually. Manual action is required to realign the system from the cooling tower to the service water pumphouse. While a cooling tower pump is operating, interlocks prevent the train associated service water pumps from starting. To provide additional protection, during operation while aligned to the cooling tower, the service water pump control switches may be maintained in the pull-to-lock position to prevent inadvertent pump operation. As previously discussed, realignment to the service water pumphouse requires manual action; maintaining the control switches in the pull-to-lock position does not change this required action sequence. Pump operation is not affected by maintaining the control switches in the pull-to-lock position during this period; therefore, OPERABILITY of the service water pumps is not compromised.

The limitations on service water pumphouse minimum water level and the requirements for cooling tower OPERABILITY are based on providing a 30-day cooling water supply to safety-related equipment without exceeding the safety related equipment design basis temperature and is consistent with the recommendations of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Plants," March 1974.

The Cooling Tower is normally aligned to allow return flow to bypass the tower sprays and return to the basin. Upon receipt of a Tower Actuation Signal, the fans and sprays are manually operated as required. This manual operation, which is governed by procedures, ensures that ice does not buildup on the cooling tower tile fill and fans. The cooling tower basin temperature limit of 70°F provides sufficient time for manual initiation of the cooling tower sprays and fans following the design basis seismic event with a concurrent LOCA, during the design extreme ambient temperature conditions. Under this scenario, manual action is sufficient to maintain the cooling tower basin at a temperature which precludes equipment damage during the postulated design basis event.

3/4.7.6 CONTROL ROOM SUBSYSTEMS (Continued)

SURVEILLANCE REQUIREMENTS

SR 4.7.6.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not too severe, testing each train in accordance with the Surveillance Frequency Control Program provides an adequate check of this system. Periodic heater operations dry out any moisture accumulated in the charcoal from humidity in the ambient air. Systems with heaters must be operated for ≥10 continuous hours with the heaters energized. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

SRs also periodically test the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal.

The SRs verify that each CREMAFS train starts and operates on test actuation signals. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

SR 4.7.6.2

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 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, Action b. must be entered. 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. 5), which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 6). These compensatory measures may also be used as mitigating actions as required by Action b.2. 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.

3/4.7.6 CONTROL ROOM SUBSYSTEMS (Continued)

REFERENCES

1. FSAR, Section 6.4

2. FSAR, Chapter 15

3. FSAR, Section 6.4.4.2

4. FSAR, Section 6.4

5. Regulatory Guide 1.196

6. NEI 99-03, "Control Room Habitability Assessment"

AIR CONDITIONING

The OPERABILITY of the safety-related Control Room Air Conditioning Subsystem ensures that the allowable temperature for continuous-duty rating for the equipment and instrumentation cooled by this system is not exceeded. The safety-related Control Room Air Conditioning Subsystem consists of two independent and redundant trains that provide cooling of recirculated control room air. The design basis of the safety-related Control Room Air Conditioning Subsystem is to maintain the control room temperature for 30 days of continued occupancy. The safety-related chillers are designed to operate in conditions down to the design basis winter temperature. When the chiller units unload due to insufficient heat load on the system, each Control Room air Conditioning Subsystem remains operable. Surveillance to demonstrate OPERABILITY will verify each subsystem has the capability to maintain the control room area temperature less than the limiting equipment qualification temperature. The operational surveillance will be performed in accordance with the Surveillance Frequency Control Program, requiring each safety-related Control Room Air Conditioning Subsystem to operate over a twenty-four hour period. This will ensure the safety related subsystem can remove the heat load based on daily cyclic outdoor air temperature.

The Control Room Air Conditioning fans are necessary to support both the operation of the Control Room Emergency Makeup Air and Filtration and the Control Room Air Conditioning Subsystems.

3/4.8.1 AC SOURCES (Continued)

LIMITING CONDITION FOR OPERATION (LCO) (continued)

f. With Train A and Train B EDGs inoperable, there are no remaining standby AC sources. Thus, with an assumed loss of offsite electrical power, insufficient standby AC sources are available to power the minimum required ESF functions. For this level of degradation, the offsite electrical power system is the only source of AC power available. The risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown (the immediate shutdown could cause grid instability and inadvertent generator trip, which could result in a total loss of AC power); however, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

According to Reference 6, with both EDGs inoperable, operation may continue for a period that should not exceed 2 hours. If one EDG is restored within 2 hours power operation may continue in accordance with ACTION b.

Following the 2-hour AOT, ACTION f. requires that both diesel generators be restored to Operable status within 72 hours. The requirement for restoring both diesel generators to OPERABLE status within 72 hours may be extended to 14 days to perform either extended preplanned maintenance (both preventive and corrective) or extended unplanned corrective maintenance work. Prior to exceeding the 72-hour AOT the SEPS must be available and an operational readiness status check performed in accordance with Technical Requirement (TR) 31. Refer to Bases for ACTION b. for additional information and requirements.

SURVEILLANCE REQUIREMENTS (SR)

The AC sources are designed to permit inspection and testing of important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, Appendix A, GDC 18 (Ref 8). Periodic component tests are supplemented by extensive functional tests in accordance with the Surveillance Frequency Control Program (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the EDGs are in accordance with the recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 9), and Regulatory Guide 1.137 (Ref. 10), as addressed in the UFSAR including exceptions thereto.

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of 3740 Vac is 90% of the nominal 4160 Vac output voltage. This value, which is specified in ANSI C84.1 (Ref 11) allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 Vac. It also allows for voltage drops to motors and other equipment down through the 120 Vac level where minimum operating voltage is also usually specified as 90% of nameplate rating. The specified maximum steady state output voltage of 4580 Vac is equal to the nominal bus voltage plus 10%. The specified minimum and maximum frequencies of the EDG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ±2% of the 60 Hz nominal frequency and are derived from the recommendations given in Regulatory Guide 1.9 (Ref. 3).

SR 4.8.1.1.1a

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution buses and loads are connected to their preferred power source, and that appropriate independence of offsite circuits is maintained. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

3/4.8.1 AC SOURCES (Continued)

SURVEILLANCE REQUIREMENTS (SR) (continued)

SR 4.1.1.1b

Transfer of each 4.16 kV ESF bus power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. The transfer circuit is only required to be OPERABLE when the offsite circuit to which it transfers is credited as being OPERABLE. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

SR 4.8.1.1.1.b is modified by footnote * prohibiting performance during MODE 1 or 2. The reason for the Note is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems.

SR 4.8.1.1.2a through 2.g

These SRs help to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and to maintain the unit in a safe shutdown condition.

SR 4.8.1.1.2 is modified by footnote ** to indicate that all planned EDG starts for the purposes of these surveillances may be preceded by an engine prelube period. This allowance is to minimize wear on moving parts since the EDG does not get lubricated when the engine is not running.

The term "standby condition" used throughout these SRs mean that the diesel engine coolant and oil are being continuously circulated and engine temperature is being maintained consistent with manufacturer recommendations at keep-warm values.

SR 4.8.1.1.2a

Activities to demonstrate EDG OPERABILITY under this SR are to be performed in accordance with the Surveillance Frequency Control Program.

SR 4.8.1.1.2a.1) provides verification that the level of fuel oil in the day tank is at or above the level at which fuel oil is automatically added. The level is expressed as an equivalent volume in gallons, and is selected to ensure adequate fuel oil for a minimum of 1 hour of EDG operation at full load plus 10%. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

SR 4.8.1.1.2a.2) provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each EDG's operation for 7 days. The 7-day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

3/4.8.1 AC SOURCES (Continued)

SURVEILLANCE REQUIREMENTS (SR) (continued)

SR 4.8.1.1.2a.3) demonstrates that each required fuel oil transfer pump operates and transfers fuel oil from its associated storage tank to its associated day tank. This is required to support continuous operation of standby power sources. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

SR 4.8.1.1.2a.4) ensures that sufficient lube oil inventory is available to support at least 7 days of operation for each EDG. The 275 gal minimum requirement is based on the EDG manufacturer consumption values for the run time of the EDG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the EDG, when the EDG lube oil sump does not hold adequate inventory for 7 days of operation without the level reaching the manufacturer recommended minimum level. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

SR 4.8.1.1.2a.5) ensures that the EDG is capable of starting from standby conditions and attaining rated voltage and frequency. Footnote *** allows a modified start procedure to be used in lieu of the 10-12 seconds "fast start" for the EDG. In order to reduce stress and wear on diesel engines, the manufacturer recommends a modified start in which the starting speed of the EDG is limited, warmup is limited to this lower speed, and the EDG is gradually accelerated to synchronous speed prior to loading. Use of the modified start method requires the diesel governor system to be capable of engine idling and gradual acceleration to synchronous speed. When the modified start is not used footnote *** requires that the time, voltage, and frequency tolerances of SR 4.8.1.1.2e) (10 second start) be met. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

SR 4.8.1.1.2a.6) verifies that the EDG is capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the EDG is connected to the offsite source.

To minimize mechanical stress and wear on the diesel engine SR 4.8.1.1.2a.6) is modified by footnote **** that allows EDG loading per the manufacturers recommendations, including a warmup period. In addition, footnote **** states that momentary transients outside the load range, due to changing bus conditions do not invalidate the test. Footnote **** also stipulates a prerequisite requirement for performance of this SR whereby this SR must be preceded by and immediately follow a successful EDG start per SR 4.8.1.1.2a.5) or SR 4.8.1.1.2e to credit satisfactory performance.

Note that although no power factor requirements are established by SR 4.8.1.1.2a.6), the EDG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while the 1.0 is an operational limitation to ensure circulating currents are minimized. The load band is provided to avoid routine overloading of the EDG. Routine overloading may result in more frequent tear down inspections in accordance with vendor recommendations in order to maintain EDG OPERABILITY. Similarly, though not stated in footnote ****, momentary kvar transients above the limit do not invalidate the test.

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

3/4.8.1 AC SOURCES (Continued)

SURVEILLANCE REQUIREMENTS (SR) (continued)

SR 4.8.1.1.2a.7) ensures that following EDG testing per SR 4.8.1.1.2a.5) and SR 4.8.1.1.2a.6) that the EDG is returned to ready to standby status when offsite power is restored. It also ensures that the auto-start logic is reset to allow the EDG to reload if a subsequent loss of offsite power occurs. The EDG is considered to be in ready to load status when the EDG is at rated speed and voltage, the output breaker is open and can receive an autoclose signal on bus undervoltage, and the load sequence timers are reset.

SR 4.8.1.1.2b and SR 4.8.1.1.2c

Removal of water from the fuel oil day and storage tanks in accordance with the Surveillance Frequency Control Program eliminates the necessary environment for bacterial survival. Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during EDG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. The surveillance frequency is controlled under the Surveillance Frequency Control Program. This SR is for preventative maintenance. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed during the performance of this Surveillance.

SR 4.8.1.1.2d

For proper operation of the standby EDGs, it is necessary to ensure the proper quality of the fuel oil. Regulatory Guide 1.137 (Ref. 10) addresses the recommended fuel oil practices as supplemented by ANSI Standards. The SR refers to the Diesel Fuel Oil Testing Program (Specification 6.7.6i) for the verification of new and stored fuel oil properties. The fuel oil properties governed by Specification 6.7.6i are water and sediment content, kinematic viscosity, specific gravity (or API gravity), and impurity level. Technical Requirements Program (TRP) 5.1 implements the requirements of Specification 6.7.6i. The surveillance frequency is controlled under the Surveillance Frequency Control Program. This Surveillance ensures the availability of high quality fuel oil for the EDGs.

SR 4.8.1.1.2e

This surveillance requires that, in accordance with the Surveillance Frequency Control Program, the EDG starts from standby conditions and achieves required voltage and frequency within 10 seconds (a.k.a, "fast start"). The 10-second start requirement supports the assumptions of the design basis LOCA analysis in the UFSAR, Chapter 15 (Ref. 5).

Upper limits for voltage and frequency are not specified during the initial EDG start in order to account for potential overshoot in voltage and frequency because of governor control system characteristics when testing the EDG in an unloaded condition.

Since this SR requires a 10 second start, it is more restrictive than SR 4.8.1.1.2a.5), and it may be performed in lieu of SR 4.8.1.1.2a.5). Associated footnote [#] allows crediting of this SR for SR 4.8.1.1.2a.5). Additionally, footnote [#] stipulates that gradual loading per SR 4.8.1.1.2a.6) must immediately follow this surveillance.

In addition to the SR requirements, the time for the EDG to reach steady state operation, unless the modified EDG start method is employed, is periodically monitored and the trend evaluated to identify degradation of governor and voltage regulator performance.

3/4.8.1 AC SOURCES (Continued)

SURVEILLANCE REQUIREMENTS (SR) (continued)

This SR in combination with SR 4.8.1.1.2a.5) help to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and to maintain the unit in a safe shutdown condition.

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

SR 4.8.1.1.2f

Surveillances carried out under SR 4.8.1.1.2f are in accordance with the Surveillance Frequency Control Program. The SR is modified by footnote ## which provides a dispensation from the 'during shutdown' requirement provided an evaluation supports the safe conduct of a particular surveillance in a condition or mode that is consistent with safe operation of the plant. This disposition is consistent with Generic Letter 91-04 (Ref. 13).

Note: SR 4.8.1.1.2f.1) and SR 4.8.1.1.2.2f.13) are Not Used.

SR 4.8.1.1.2f.2) demonstrates the EDG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency limits. This surveillance may be accomplished by either:

a. Tripping the EDG output breaker with the EDG carrying greater than or equal to its associated single largest post-accident load while paralleled to offsite power, or while solely supplying the bus, or

b. Tripping its associated single largest post-accident load with the EDG solely supplying the bus.

If method a. is used the EDG power factor must be in the range of 0.9 which is representative of actual design basis inductive loading.

The voltage and frequency specified are consistent with the design range of the equipment powered by the EDG and are the steady state voltage and frequency values to which the system must recover following load rejection. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

SR 4.8.1.1.2f.3) demonstrates the DG's capability to reject a full load without overspeed tripping or exceeding the predetermined voltage limits. The DG full load rejection may occur because of a system fault or inadvertent breaker tripping. This Surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the DG experiences following a full load rejection and verifies that the DG does not trip upon loss of the load. These acceptance criteria provide for DG damage protection. While the DG is not expected to experience this transient during an event and continues to be available, this response ensures that the DG is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated.

As required by IEEE-387 (Ref. 12), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower.

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

3/4.8.1 AC SOURCES (Continued)

SURVEILLANCE REQUIREMENTS (SR) (continued)

SR 4.8.1.1.2f.4) demonstrates the as designed operation of the standby power sources during loss of the offsite source, as required by Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(1). This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the EDG. It further demonstrates the capability of the EDG to automatically achieve the required voltage and frequency within the specified time.

The EDG auto-start time of 12 seconds is derived from requirements of the accident analysis to respond to a loss of offsite power event. The Surveillance must be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability is achieved.

The requirement to verify the connection and power supply of permanent and auto-connected shutdown loads is intended to satisfactorily show the relationship of these loads to the EDG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. In lieu of actual demonstration of connection and loading of loads, testing and analysis that adequately show the capability of the EDG systems to perform these loading functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified. Similarly, pumps need not be operated at design basis flows since the purpose of the SR is only to verify correct loading sequence.

This SR is modified by footnote ### to allow starting of the diesel engine at or near normal operating temperature in lieu of standby conditions. The reason for the footnote is to minimize wear and tear on the EDGs during testing. Repeated fast starts with the diesel engine starting at a standby condition temperature still contribute to accelerated engine degradation. Starting of the diesel generator from standby conditions, equivalent to the keep-warm systems temperature, would continue to be performed per SR 4.8.1.1.2f.6) (the loss-of-offsite power in conjunction with a SI actuation test signal) which would meet the spirit of Generic Letter 84-15 (Ref. 7). This allowance would also benefit outage planning and scheduling to shorten the length of the outage by not needing to wait for the engine to cool down before starting the next test. In addition, this capability would continue to be verified during the fast start test per SR 4.8.1.1.2e.

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

SR 4.8.1.1.2f.5) demonstrates that the EDG automatically starts and reaches the minimum voltage and frequency requirements within the specified time (10 seconds) from the design basis (LOCA) actuation signal (SI signal) without loss of offsite power, maintains steady-state voltage and frequency within prescribed limits, and operates on standby for at least 5 minutes. The 5-minute period provides sufficient time to demonstrate stability. Upper limits for voltage and frequency are not specified during the initial EDG start in order to account for potential overshoot in voltage and frequency because of governor control system characteristics when testing the EDG in an unloaded condition. The time, voltage and frequency for the EDG to reach steady state operation is periodically monitored and the trend evaluated to identify degradation of governor and voltage regulator performance.

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

3/4.8.1 AC SOURCES (Continued)

SURVEILLANCE REQUIREMENTS (SR) (continued)

This SR is modified by footnote ###, as described in SR 4.8.1.1.2f.4), to minimize wear and tear on the EDGs during testing.

SR 4.8.1.1.2f.6) demonstrates the EDG operation, as discussed in the Bases for SR 4.8.1.1.2f.4), during a loss of offsite power actuation test signal in conjunction with a SI actuation signal. In the event of a DBA coincident with a loss of offsite power, the EDGs are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded. The basis for the EDG auto-start is as discussed in the Bases for SR 4.8.1.1.2f.5). The basis for the EDG loading is as discussed in the Bases for SR 4.8.1.1.2f.4).

The surveillance must be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability is achieved.

The SR is performed with the EDG initially at standby condition, i.e., equivalent to the keep-warm systems temperature. This requirement is consistent with Generic Letter 84-15 (Ref. 7) which notes that the design basis for the plant, i.e., large LOCA coincident with loss of offsite power requires the EDG to be capable of starting from ambient conditions (keep-warm system temperature).

The SR also demonstrates that all automatic protective trip functions (e.g., high jacket water temperature) except, engine overspeed, 4160 volt bus fault, generator differential current, and low lube oil pressure, are bypassed on a loss of voltage signal concurrent with a SI actuation test signal. The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The EDG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the EDG.

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

SR 4.8.1.1.2f.7) demonstrates that the EDGs can start and run continuously at full load capability for an interval of not less than 24 hours at a load equivalent to 92 - 100 percent of the continuous duty rating of the EDG. The EDG starts for this SR can be performed either from standby or hot conditions. The load band is provided to avoid routine overloading of the EDG. Routine overloading may result in more frequent tear down inspections in accordance with vendor recommendations in order to maintain EDG OPERABILITY.

Should auto-connected loads be added in the future such that the load on the bus reach or exceed the EDG continuous load rating, the EDG must run for a minimum of 2 hours at a load equivalent to 105 – 110 percent the continuous duty rating of the EDG. The remaining hours of the 24-hour run are to be at 92 – 100 percent full load. In addition, the SR requires verification that the auto-connected loads do not exceed the short term rating of the EDG.

Note that although no power factor requirements are established by SR 4.8.1.1.2f.7), the EDG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while the 1.0 is an operational limitation to ensure circulating currents are minimized. The load band is provided to avoid routine overloading of the EDG. Routine

3/4.8.1 AC SOURCES (Continued)

SURVEILLANCE REQUIREMENTS (SR) (continued)

overloading may result in more frequent tear down inspections in accordance with vendor recommendations in order to maintain EDG OPERABILITY.

To minimize mechanical stress and wear on the diesel engine SR 4.8.1.1.2f.7) is modified by footnote #### that allows EDG loading per the manufacturers recommendations, including a warmup period. In addition, the footnote states that momentary transients outside the load range, due to changing bus conditions do not invalidate the test. Similarly, though not stated in footnote ####, momentary kvar transients above the limit do not invalidate the test.

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

SR 4.8.1.1.2f.8) demonstrates that the diesel engine can restart within 5 minutes from a hot condition, such as subsequent to shutdown from normal surveillances, and achieve the minimum required voltage and frequency within 10 seconds and steady-state conditions thereafter. The time, voltage and frequency for the EDG to reach steady state operation is periodically monitored and the trend evaluated to identify degradation of governor and voltage regulator performance.

The requirement that the diesel has operated for at least 2 hours at sufficiently loaded conditions prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. The load band is provided to avoid routine overloading of the EDG.

The SR is modified by footnote + noting that momentary transients outside the load range, due to changing bus loads, do not invalidate the test.

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

SR 4.8.1.1.2f.9) ensures, as recommended by Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(6), that the manual synchronization and load transfer (emergency loads) from the EDG to the offsite source can be made and the EDG can be returned to standby status when offsite power is restored. It also ensures that the auto-start logic is reset to allow the EDG to reload if a subsequent loss of offsite power occurs. The EDG is considered to be in standby status when the EDG is aligned for auto-start, the EDG circuit breaker is available for automatic closure, and the emergency power sequencer timer(s) are reset and available for automatic operation.

The three sub-steps do not need to be performed sequentially. It is acceptable to delay performance of sub-step c) to support optimum scheduling of maintenance and surveillance activities so long as the requisite test criteria are met when it is performed.

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

SR 4.8.1.1.2f.10) is a demonstration of the test mode override which ensures that EDG availability under accident conditions will not be compromised as a result of testing the EDG while connected to its bus. The EDG is verified to return to standby operation and the emergency loads are automatically energized with offsite power if a SI actuation signal is received during operation in the test mode. Ready to load operation is defined as the EDG running at rated speed and voltage with the EDG output breaker open.

The requirement to automatically energize the emergency loads with offsite power is intended

3/4.8.1 AC SOURCES (Continued)

SURVEILLANCE REQUIREMENTS (SR) (continued)

to show that the emergency loading was not affected by the EDG operation in test mode. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or RHR systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the emergency loads to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

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

SR 4.8.1.1.2f.11) demonstrates that each required fuel oil transfer pump operates and transfers fuel oil from each storage tank to each EDG day tank via the installed cross-connection lines. This is required to support continuous operation of standby power sources. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for fuel transfer systems are OPERABLE.

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

SR 4.8.1.1.2f.12) ensures that under loss of offsite power conditions, with or without an accident, loads are sequentially connected to the bus by the emergency power sequencer timer. The sequencing logic controls the permissive and starting signals to motor and other load breakers to prevent overloading of the EDGs due to high inrush starting currents. The 10% load sequence time interval tolerance ensures that sufficient time exists for the EDG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. Reference 2 provides a summary of the automatic loading of ESF buses.

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

SR 4.8.1.1.2f.14) demonstrates that when a Tower Actuation (TA) signal is generated, while the EDG is loaded with its permanently connected loads and auto-connected emergency accident loads, the associated operating service water pump automatically trips and the corresponding cooling tower pump starts and after energization that voltage and frequency of the emergency bus remains within steady-state limits.

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

3/4.8.1 AC SOURCES (Continued)

SURVEILLANCE REQUIREMENTS (SR) (continued)

SR 4.8.1.1.2f.15) demonstrates that while EDG 1A is loaded with its permanently connected loads and auto-connected emergency loads, that emergency bus E5 voltage and frequency remain within steady-state limits after manual energization of the 1500 hp startup feedwater pump (the largest manually-connected load).

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

SR 4.8.1.1.2g

This surveillance demonstrates that the EDG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper voltage and frequency within 10 seconds then steady-state condition when the EDGs are started simultaneously. The time, voltage and frequency for the EDG to reach steady state operation is monitored and the trend evaluated to identify degradation of governor and voltage regulator performance.

The SR also requires that the EDGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations at keep-warm values.

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

MODES 5 AND 6

During operation in MODEs 5 and 6, the required AC sources include one off-site circuit capable of supplying the on-site Class 1E distribution system and an operable emergency diesel generator. These minimum AC sources ensure that (1) the unit can be maintained in the shutdown condition, (2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit, and (3) adequate AC power is available to mitigate an event postulated to occur during shutdown.

If the minimum required AC sources are not operable, the action statement requires immediately suspending core alternation, positive reactivity changes, movement of irradiated fuel, and crane operation with loads over the fuel pool. With respect to suspending positive reactivity changes, operations that individually add limited, positive reactivity are acceptable when, combined with other actions that add negative reactivity, the overall net reactivity addition is zero or negative. For example, a positive reactivity addition caused by temperature fluctuations from inventory addition or temperature control fluctuations is acceptable if it is combined with a negative reactivity addition such that the overall, net reactivity addition is zero or negative. Refer to TS Bases 3/4.9.1, Boron Concentration, for limits on boron concentration and water temperature for MODE 6 action statements involving suspension of positive reactivity changes.

3/4.8.2 DC SOURCES (continued)

The Surveillance Requirement for demonstrating the OPERABILITY of the station batteries are in accordance with the Surveillance Frequency Control Program.

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values, and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates, and compares the battery capacity at that time with the rated capacity.

Table 4.8-2 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage, and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-2 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

3/4.8.3 ONSITE POWER DISTRIBUTION

BACKGROUND

The onsite Class 1E AC, DC, and AC vital instrument bus electrical power distribution systems are divided by train into two redundant and independent power distribution subsystems.

The AC electrical power subsystem of each train consists of a Class 1E 4.16 kV emergency bus, 480-volt unit substations, and 120-volt vital instrument panels. Each 4.16 kV emergency bus has at least one separate and independent offsite source of power as well as a dedicated onsite diesel generator (DG) source. Each 4.16 kV emergency bus is normally energized from the unit auxiliary transformer (UAT). The opening of the UAT incoming line breaker, either manually or automatically, initiates an automatic transfer from the UAT to reserve auxiliary transformer (RAT), provided that the RAT transformer is energized. If all offsite sources are unavailable, the onsite

3/4.8.3 ONSITE POWER DISTRIBUTION (continued)

emergency DG supplies power to the 4.16 kV emergency buses. Control power for the 4.16 kV breakers is supplied from the Class 1E batteries.

Although not explicitly contained in TS 3.8.3.1 and 3.8.3.2, the MCCs that support the design function of the on-site AC power system must be energized to permit the functioning of structures, systems, and components important to safety under all normal and accident conditions. The AC distribution system ensures the safety functions of the Reactor Coolant Makeup, Residual Heat Removal, Emergency Core Cooling, Containment Heat Removal, Containment Atmosphere Cleanup, and the Cooling Water Systems can be accomplished. The accident analyses assume that the ESF systems are operable, which includes the availability of necessary power. Consequently, the MCCS that support these functions are required to be energized to maintain operability of the associated ESF systems and components.

No bus ties exist between redundant buses; however, manual bus tie breakers provide the capability to interconnect load center buses within a single train. Bus ties may be used when a unit substation transformer is out of service for maintenance or repair. Bus ties are provided only for operational flexibility. The unit substations are not designed to supply the total load of both buses when bus ties are used. When a bus tie breaker is used, loading on each unit substation will be administratively controlled to be within the rating of the unit substation transformer.

The 120V Vital Instrumentation and Control Power System consists of the uninterruptible power supply (UPS) units and the 120-volt vital instrument panels arranged in two trains. The four vital UPS units that provide power to the four NSSS instrumentation channels are powered from either the 480V system or 125V DC system depending on the available 480V bus voltage. Two vital UPS units that provide redundant power supplies to the balance-of-plant train A and train B vital instrument panels are normally powered from the 480V system and can also convert 125V DC power from the station batteries to 120V AC power. These UPS units feed six electrically independent 120-volt AC vital instrument panels which serve as instrument and control power supplies.

The DC electrical power distribution system for each train consists of two 125-volt DC buses.

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient SAFETY analyses in the UFSAR assume Engineered Safety Features (ESF) systems are OPERABLE. The AC, DC, and DC 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, DC, and AC vital bus electrical power distribution systems in MODES 1 through 4 is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining power distribution systems OPERABLE during accident conditions in the event of:

3/4.8.3 ONSITE POWER DISTRIBUTION (continued)

ACTIONS (continued)

MODES 5 and 6

With less than the minimum required on-site power distribution systems sources, the action statement requires immediately suspending core alterations, positive reactivity changes, or movement of irradiated fuel. With respect to suspending positive reactivity changes, operations that individually add limited, positive reactivity are acceptable when, combined with other actions that add negative reactivity, the overall net reactivity addition is zero or negative. For example, a positive reactivity addition caused by temperature fluctuations from inventory addition or temperature control fluctuations is acceptable if it is combined with a negative reactivity addition such that the overall, net reactivity addition is zero or negative. Refer to TS Bases 3/4.9.1, Boron Concentration, for limits on boron concentration and water temperature for MODE 6 action statements involving suspension of positive reactivity changes.

SURVEILLANCE REQUIREMENTS

Operability of the required electrical buses is confirmed by verifying correct breaker alignment and indicated voltage on the buses. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

3/4.8.4 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

Containment electrical penetrations are protected by deenergizing circuits not required during reactor operation. The OPERABILITY of the motor-operated valves thermal overload protection ensures that the thermal overload protection will not prevent safety-related valves from performing their function. The Surveillance Requirements for demonstrating the OPERABILITY of the thermal overload protection are in accordance with Regulatory Guide 1.106, "Thermal Overload Protection for Electric Motors on Motor Operated Valves," Revision 1, March 1977.

3/4.9.2 INSTRUMENTATION (Continued)

SURVEILLANCE

SR 4.9.2.a

SR 4.9.2.a is the performance of a CHANNEL CHECK, which is a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that the two indication channels should be consistent with core conditions. Changes in fuel loading and core geometry can result in significant differences between source range channels, but each channel should be consistent with its local conditions.

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

SR4.9.2b

SR 4.9.2.b is the performance of a CHANNEL CALIBRATION. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. The CHANNEL CALIBRATION for the source range neutron flux monitors consists of obtaining the detector plateau or preamp discriminator curves, evaluating those curves, and comparing the curves to the manufacturer's data. The CHANNEL CALIBRATION also includes verification of the audible count rate function. The surveillance frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A. GDC 13, GDCP 26, GDC 28, and GDC 29.

2. FSAR, Section 15.4.6

3/4.9.3 DECAY TIME

The minimum requirement for reactor subcriticality prior to movement of irradiated fuel assemblies in the reactor vessel ensures that sufficient time has elapsed to allow the radioactive decay of the short-lived fission products. This decay time is consistent with the assumptions used in the safety analyses.

3/4.9.9 (THIS SPECIFICATION NUMBER IS NOT USED.)

3/4.9.10 and 3/4.9.11 WATER LEVEL - REACTOR VESSEL and STORAGE POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gap activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the safety analysis. Suspending fuel movement or crane operation does not preclude moving a component to a safe location.

3/4.9.12 FUEL STORAGE BUILDING EMERGENCY AIR CLEANING SYSTEM

The limitations on the Fuel Storage Building Emergency Air Cleaning System ensure that all radioactive material released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal adsorber prior to discharge to the atmosphere. Operation of the system with the heaters operating for at least 10 continuous hours in a 31-day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters. The OPERABILITY of this system and the resulting iodine removal capacity are consistent with the assumptions of the safety analyses. ANSI N510-1980 will be used as a procedural guide for surveillance testing. Suspending fuel movement or crane operation does not preclude moving a component to a safe location.

One train of the Fuel Storage Building Emergency Air Cleaning System must be in operation during fuel movement. This requirement, however, does not apply to movement of a spent fuel cask containing irradiated fuel in preparation for transfer to dry storage. Movement of fuel after it has been inserted into a spent fuel cask and unlatched from the lifting tool is no longer a consideration with regard to this specification.

3/4.9.13 SPENT FUEL ASSEMBLY STORAGE

Restrictions on placement of fuel assemblies of certain enrichments within the Spent Fuel Pool is dictated by Specification 5.6.1.3. These restrictions ensure that the k_{eff} of the Spent Fuel Pool will always remain less than 1.0 assuming the pool to be flooded with unborated water and less than or equal to 0.95 when flooded with water borated to 500 ppm. The restrictions delineated in Specification 5.6.1.3 and the action statement are consistent with the criticality safety analysis performed for the Spent Fuel Pool as documented in the UFSAR.

3/4.9.14 NEW FUEL ASSEMBLY STORAGE

Restrictions on placement of fuel assemblies of certain enrichments within the New Fuel Storage Vault is dictated by Specification 3/4.9.14. These restrictions ensure that the K_{eff} of the New Fuel Storage Vault will always remain less than 0.95 assuming the area to be flooded with unborated water. In addition, these restrictions ensure that the K_{eff} of the New Fuel Storage Vault will always remain less than 0.98 when aqueous foam moderation is assumed. The restrictions delineated in Specification 3/4.9.14 and the action statement are consistent with the criticality safety analysis performed for the New Fuel Storage Vault as documented in the FSAR.

3/4.9.15 SPENT FUEL POOL BORON CONCENTRATION

The limitation on the Spent Fuel Pool boron concentration ensures that sufficient boron is present to maintain criticality margin during any potential spent fuel pool accident. The required boron concentration is also sufficient to ensure that no boron dilution event could reduce the spent fuel concentration below 500 ppm. The action statement requires immediately suspending movement of fuel until the boron concentration has been restored. This does not preclude movement of a fuel assembly to a safe position.