TS 5.5.14

Progress Energy

Serial: RNP-RA/09-0024

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United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

TRANSMITTAL OF TECHNICAL SPECIFICATIONS BASES REVISIONS

Ladies and Gentlemen:

In accordance with Technical Specifications 5.5.14.d, Carolina Power and Light Company, also known as Progress Energy Carolinas, Inc., is transmitting revisions to the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, Technical Specifications Bases. The attachment to this letter provides Technical Specifications Bases pages for Revisions Number 36 through 39.

If you have any questions concerning this matter, please contact me at (843) 857-1626.

Sincerely,

Curt Castell

Curt Castell
Supervisor – Licensing/Regulatory Programs

RAC/rac

Attachment

c: L. A. Reyes, NRC, Region II
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A001
NRR

United States Nuclear Regulatory Commission
Attachment to Serial: RNP-RA/09-0024
38 Pages (including cover page)

# H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

## TECHNICAL SPECIFICATIONS
## BASES PAGES FOR REVISIONS NUMBER 36 THROUGH 39

BASES

ACTIONS (continued)

A.2

Reduction of THERMAL POWER to ≤ 50% RTP more than offsets the increase in core $F_Q$ and $F^N_{\Delta H}$ due to rod position. The allowed Completion Time of 8 hours is reasonable, based on operating experience, for reducing power to ≤ 50% RTP from full power conditions without challenging plant systems and allowing for rod position determination by Required Action A.1 above.

B.1 and B.2

These Required Actions clarify that when one or more rods with inoperable position indicators have been moved in excess of 24 steps in one direction, since the position was last determined, the Required Actions of A.1 and A.2 are still appropriate but must be initiated promptly under Required Action B.1 to begin verifying that these rods are still properly positioned, relative to their group positions.

If, within 4 hours, the rod positions have not been determined, THERMAL POWER must be reduced to ≤ 50% RTP within 8 hours to avoid undesirable power distributions that could result from continued operation at > 50% RTP, if one or more rods are misaligned by more than 24 steps. The allowed Completion Time of 4 hours provides an acceptable period of time to verify the rod positions.

C.1.1, C.1.2, and C.1.3

Condition C is modified by a footnote that provides a condition for two demand position indicators per bank to be inoperable for one or more banks. The footnote states that the required action is restoration of one demand position indicator per bank and a completion time of 4 hours. When one or more demand position indicators are inoperable in one or more banks, Condition C is entered. If two demand position indicators are inoperable in a bank, the footnote required action and completion time are applied. After expiration of the 4 hour completion time associated with the footnote condition, Required Action D.1 to be in MODE 3 within 6 hours is required to be entered. Additionally, during the time when two demand indicators per bank are inoperable, Required Action C.1.3 cannot be completed. Expiration of the C.1.3 completion time will require entry into Required Action D.1 to be in MODE 3 within 6 hours. Required Action D.1 would be applicable

(continued)

BASES

ACTIONS (continued)

until power has been reduced to ≤ 50%, at which time the Required Action C.2 would be met.

With one demand position indicator per bank inoperable, the rod positions can be determined by the ARPI System. Since normal power operation does not require excessive movement of rods, verification by administrative means that the rod position indicators are OPERABLE, that the position of each rod in the affected bank(s) is within 7.5 inches of the average of the individual rod positions in the affected bank(s), for bank positions < 200 steps and that the position of each rod in the affected bank(s) is within 15 inches of the bank demand position for bank positions ≥ 200 steps within the allowed Completion Time of once every 8 hours is adequate.

C.2

Reduction of THERMAL POWER to ≤ 50% RTP puts the core into a condition where rod position is not significantly affecting core peaking factors. The allowed Completion Time of 8 hours provides an acceptable period of time to verify the rod positions per Required Actions C.1.1 and C.1.2 or reduce power to ≤ 50% RTP.

D.1

If the Required Actions cannot be completed within the associated Completion Time, the plant must be brought to a MODE in which the requirement does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours. The allowed Completion Time is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1

Performance of the CHANNEL CHECK once every 12 hours and "once within 4 hours following rod motion > 6 inches when the rod position deviation monitor is inoperable" ensures that a gross instrumentation failure has not occured. The CHANNEL CHECK of rod position indication is a comparison of the rod position indicated on analog rod position indication channels and bank demand position indication channels. It is based on the assumption that instrument channels

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1 (continued)

monitoring the same parameter should read approximately the same value. Significant deviations between the analog rod position indication of excessive instrument drift in one of the indication channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is the key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

The channel deviation criterion is based on meeting the requirement of LCO 3.1.4, "Rod Group Alignment Limits," item a. If a channel is outside the criteria, it may be an indication that rod position indication has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

The Frequencies of 12 hours and "once within 4 hours following rod motion > 6 inches when the rod position deviation monitor is inoperable" are based on operating experience. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.1.7.1 is modified by a Note which states the surveillance is only required to be met for bank positions ≥ 200 steps since LCO 3.1.4, item a, limits related to comparison of analog rod position and bank demand position inidication only apply for bank positions ≥ 200 steps.

SR 3.1.7.2

Verification that each ARPI is within 7.5 inches of the average of the individual ARPIs in the associated bank after moving each full length RCCAs bank ≥ 19 steps and then returning the banks to their original positions provides adequate assurance that each ARPI is operating correctly. The 31 day Frequency is based on operating experience.

SR 3.1.7.2 is modified by a Note which states the surveillance is only required to be met for bank positions < 200 steps since LCO 3.1.4, item b, limits related to comparison of analog rod position and the average of the individual analog rod position indications only apply for bank positions < 200 steps.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.7.3

Verification that each ARPI is within 15 inches of the associated bank demand position after moving each full length RCCAs bank ≥ 19 steps and then returning the banks to their original positions provides adequate assurance that each ARPI and bank demand position indication is operating correctly. The 31 day Frequency is based on operating experience.

SR 3.1.7.3 is modified by a Note which states the surveillance is only required to be met for bank positions ≥ 200 steps since LCO 3.1.4, item a, limits related to comparison of analog rod position and bank demand position indication only apply for bank positions ≥ 200 steps.

SR 3.1.7.4

A CHANNEL CALIBRATION of the ARPI System is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to the measured parameter with the necessary range and accuracy. The 18 month Frequency is based on the need to perform this Surveillance under conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.

REFERENCES

1. UFSAR Section 3.1.2.
2. CP&L Letter, E. E. Utley to NRC, "Rod Position Indication System," dated 12/14/79.
3. UFSAR, Chapter 15.

BASES

BACKGROUND (continued)

The axial position of shutdown rods and control rods are determined by two separate and independent systems: the Bank Demand Position Indication System (commonly called group step counters) and the Analog Rod Position Indication (ARPI) System.

The Bank Demand Position Indication System counts the pulses from the Rod Control System that move the rods. There is one step counter for each group of rods. Individual rods in a group all receive the same signal to move and should, therefore, all be at the same position indicated by the group step counter for that group. The Bank Demand Position Indication System is considered highly precise (± 1 step or ± 5/8 inch). If a rod does not move one step for each demand pulse, the step counter will still count the pulse and incorrectly reflect the position of the rod.

The ARPI System provides a highly accurate indication of actual control rod position, but at a lower precision than the step counters. This system is based on inductive analog signals from a series of coils spaced along a hollow tube with a center to center distance of 3.75 inches, which is 6 steps. Therefore, the normal indication accuracy of the ARPI System is ± 6 steps (± 3.75 inches), and the maximum uncertainty is ± 12 steps (± 7.5 inches). With an indicated deviation of 12 steps between the group step counter and ARPI, the maximum deviation between actual rod position and the demand position could be 24 steps, or 15 inches (Ref. 2).

APPLICABLE SAFETY ANALYSES

Control and shutdown rod position accuracy is essential during power operation. Power peaking, ejected rod worth, or SDM limits may be violated in the event of a Design Basis Accident (Ref. 3), with control or shutdown rods operating outside their limits undetected. Therefore, the acceptance criteria for rod position indication is that rod positions must be known with sufficient accuracy in order to verify the core is operating within the group sequence, overlap, design peaking limits, ejected rod worth, and with minimum SDM (LCO 3.1.5, "Shutdown Bank Insertion Limits," and

(continued)

B 3.6 CONTAINMENT SYSTEMS

B 3.6.3 Containment Isolation Valves

BASES

BACKGROUND

The containment isolation valves form part of the containment pressure boundary and provide a means for fluid penetrations not serving accident consequence limiting systems to be provided with two isolation barriers that are closed on a containment isolation signal. These isolation devices are either passive or active (automatic). Manual valves, de-activated automatic valves secured in their closed position (including check valves with flow through the valve secured), blind flanges, and closed systems are considered passive devices. Check valves, or other automatic valves designed to close without operator action following an accident, are considered active devices. Manual valves qualifying as containment isolation valves are secured closed. Two barriers in series are provided for each penetration so that no single credible failure or malfunction of an active component can result in a loss of isolation or leakage that exceeds limits assumed in the safety analyses. One of these barriers may be a closed system. These barriers (typically containment isolation valves) make up the Containment Isolation System.

Automatic isolation signals are produced during accident conditions. Containment Phase "A" isolation occurs upon receipt of a safety injection signal. The Phase "A" isolation signal isolates nonessential process lines in order to minimize leakage of fission product radioactivity. Containment Phase "B" isolation occurs upon receipt of a containment pressure High-High signal and isolates the remaining process lines, except systems required for accident mitigation. In addition to the isolation signals listed above, the purge supply and exhaust valves receive an isolation signal on a containment high radiation condition. As a result, the containment isolation valves (and blind flanges) help ensure that the containment atmosphere will be isolated from the environment in the event of a release of fission product radioactivity to the containment atmosphere as a result of a Design Basis Accident (DBA).

(continued)

BASES

BACKGROUND (continued)

The OPERABILITY requirements for containment isolation valves help ensure that containment is isolated within the time limits assumed in the safety analyses. Therefore, the OPERABILITY requirements provide assurance that the containment function assumed in the safety analyses will be maintained. The Isolation Valve Seal Water System (IVSW) assures the effectiveness of certain containment isolation valves during any condition which requires containment isolation, by providing a water seal at the valves. The requirements for the IVSW system are specified in LCO 3.6.8, "IVSW System."

Containment Purge System (42 inch purge valves)

The Containment Purge System operates to supply outside air into the containment for ventilation and cooling or heating and may also be used to reduce personnel exposure to airborne radioactive contaminants within containment prior to and during personnel access. The supply and exhaust lines each contain two isolation valves. Inboard purge supply and exhaust valves are restricted from exceeding 70 degrees open. This restriction assures proper valve closure under dynamic conditions and consequently limits offsite dose consequences resulting from a DBA which occurs when the valves are open. The 42 inch purge valves are normally maintained closed in MODES 1, 2, 3, and 4 to ensure the containment boundary is maintained. They may be opened during plant operation when needed for safety related reasons (both equipment and personnel) to support plant operations and maintenance activities within the containment.

Containment Pressure and Vacuum Relief Valves

The containment pressure and vacuum relief valves are provided to control variations in containment pressure with respect to atmospheric pressure which may result from air temperature changes, barometric pressure changes or air in-leakage. These valves are normally maintained closed; however, they may be opened as needed in MODES 1, 2, 3 and 4 to equalize internal and external pressure, provided that they are not open simultaneously with the containment purge valves.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The containment isolation valve LCO was derived from the assumptions related to minimizing the loss of reactor coolant inventory and establishing the containment boundary during major accidents. As part of the containment boundary, containment isolation valve OPERABILITY supports leak tightness of the containment. Therefore, the safety analyses of any event requiring isolation of containment is applicable to this LCO.

The DBA that results in a release of radioactive material within containment is a loss of coolant accident (LOCA) (Ref. 1). In the analyses for each of these accidents, it is assumed that containment isolation valves are either closed or function to close within the required isolation time following event initiation. This ensures that potential paths to the environment through containment isolation valves (including containment purge valves) are minimized.

Isolation of containment ventilation isolation valves is complete within approximately two seconds following generation of the phase A containment isolation signal. Isolation of the remaining containment isolation valves is complete within approximately ten seconds following generation of either the phase A or phase B containment isolation signal. Upon completion of containment isolation, leakage is terminated except for the design leakage rate, La.

The single failure criterion required to be imposed in the conduct of plant safety analyses was considered in the original design of the containment purge valves. Two valves in series on each purge line provide assurance that both the supply and exhaust lines could be isolated even if a single active failure occurred. The inboard and outboard isolation valves on each line are provided with air-cylinder operators, with spring assisted closure capable of closing valves in two seconds. These valves fail to the closed position on a loss of a control signal or instrument air. This arrangement was designed to preclude common mode failures from disabling both valves on a purge line.

The containment isolation valves satisfy Criterion 3 of the NRC Policy Statement.

(continued)

ACTIONS (continued)

A second Note has been added to provide clarification that, for this LCO, separate Condition entry is allowed for each penetration flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable containment isolation valve. Complying with the Required Actions may allow for continued operation, and subsequent inoperable containment isolation valves are governed by subsequent Condition entry and application of associated Required Actions.

The ACTIONS are further modified by a third Note, which ensures appropriate remedial actions are taken, if necessary, if the affected systems are rendered inoperable by an inoperable containment isolation valve.

In the event the isolation valve leakage results in exceeding the overall containment leakage rate, Note 4 directs entry into the applicable Conditions and Required Actions of LCO 3.6.1. In the event required IVSW supply is isolated to a penetration flowpath, Note 5 directs entry into applicable Conditions and Required Actions of LCO 3.6.8.

A.1 and A.2

In the event one containment isolation valve in one or more penetration flow paths is inoperable, the affected penetration flow path must be isolated. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic containment isolation valve, a closed manual valve, a blind flange, and a check valve with flow through the valve secured. For a penetration flow path isolated in accordance with Required Action A.1, the device used to isolate the penetration should be the closest available one to containment. Required Action A.1 must be completed within 4 hours. The 4 hour Completion Time is reasonable, considering the time required to isolate the penetration and the relative importance of supporting containment OPERABILITY during MODES 1, 2, 3, and 4. For some penetration flowpaths supplied by IVSW, an inoperable isolation valve may prevent

(continued)

ACTIONS

A.1 and A.2 (continued)

the IVSW system from providing a water seal. Although not directly comparable to leak rate testing performed in accordance with 10 CFR 50, Appendix J, the hydrostatic testing of the IVSW headers specified in SR 3.6.8.6 provides a means of verifying that leakage through the IVSW supplied isolation valves is limited. The four hour Completion Time to isolate the penetration is acceptable based upon consideration of the time required to isolate the flowpath, the limited leakage potential for the isolation valve and the low probability of an event requiring containment isolation during the specified time period to isolate the flowpath.

For affected penetration flow paths that cannot be restored to OPERABLE status within the 4 hour Completion Time and that have been isolated in accordance with Required Action A.1, the affected penetration flow paths must be verified to be isolated on a periodic basis. This is necessary to ensure that containment penetrations required to be isolated following an accident and no longer capable of being automatically isolated will be in the isolation position should an event occur. This Required Action does not require any testing or device manipulation. Rather, it involves verification, through a system walkdown, that those isolation devices outside containment and capable of being mispositioned are in the correct position. The Completion Time of "once per 31 days for isolation devices outside containment" is appropriate considering the fact that the devices are operated under administrative controls and the probability of their misalignment is low. For the isolation devices inside containment, the time period specified as "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is based on engineering judgment and is considered reasonable in view of the inaccessibility of the isolation devices and other administrative controls that will ensure that isolation device misalignment is an unlikely possibility.

Condition A has been modified by a Note indicating that this Condition is only applicable to those penetration flow paths with two containment isolation valves. For penetration flow paths with only one containment isolation valve and a closed system, Condition C provides the appropriate actions.

(continued)

ACTIONS

A.1 and A.2 (continued)

Required Action A.2 is modified by a Note that applies to isolation devices located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Therefore, the probability of misalignment of these devices once they have been verified to be in the proper position, is small.

B.1

With two containment isolation valves inoperable in one or more penetration flow paths with two isolation valves, the affected penetration flow path must be isolated within 1 hour. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. The 1 hour Completion Time is consistent with the ACTIONS of LCO 3.6.1. In the event the affected penetration is isolated in accordance with Required Action B.1, the affected penetration must be verified to be isolated on a periodic basis per Required Action A.2, which remains in effect. This periodic verification is necessary to assure leak tightness of containment and that penetrations requiring isolation following an accident are isolated. The Completion Time of "once per 31 days for isolation devices outside containment" for verifying each affected penetration flow path is isolated is appropriate considering the fact that the valves are operated under administrative control and the probability of their misalignment is low.

Condition B is modified by a Note indicating this Condition is only applicable to penetration flow paths with two containment isolation valves. Condition A of this LCO addresses the condition of one containment isolation valve inoperable in this type of penetration flow path.

(continued)

ACTIONS (continued)

C.1 and C.2

With one or more penetration flow paths with one containment isolation valve inoperable, the inoperable valve flow path must be restored to OPERABLE status or the affected penetration flow path must be isolated. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. The device used to isolate the flow path should be the one closest available to containment. A check valve may not be used to isolate the affected penetration flow path. Required Action C.1 must be completed within the 72 hour Completion Time. The specified time period is reasonable considering the relative stability of the closed system (hence, reliability) to act as a penetration isolation boundary and the relative importance of maintaining containment integrity during MODES 1, 2, 3, and 4. In the event the affected penetration flow path is isolated in accordance with Required Action C.1, the affected penetration flow path must be verified to be isolated on a periodic basis. This periodic verification is necessary to assure leak tightness of containment and that containment penetrations requiring isolation following an accident are isolated. The Completion Time of "once per 31 days for isolation devices outside containment" for verifying that each affected penetration flow path is isolated is appropriate because the valves are operated under administrative controls and the probability of their misalignment is low. For the isolation devices inside containment, the time period specified as "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is based on engineering judgment and is considered reasonable in view of the inaccessibility of the isolation devices and other administrative controls that will ensure that isolation device misalignment is an unlikely possibility.

Condition C is modified by a Note indicating that this Condition is only applicable to those penetration flow paths with only one containment isolation valve and a closed system. The closed system must meet the requirements of Ref. 3. This Note is necessary since this Condition is written to specifically address those penetration flow paths

(continued)

ACTIONS

C.1 and C.2 (continued)

in a closed system. In some instances penetration flow paths connected to closed systems contain more than one containment isolation valve. The inoperability of one of these valves does not render the containment penetration flow path inoperable if the remaining containment isolation valve(s) is operable and the closed system is intact.

Required Action C.2 is modified by a Note that applies to valves and blind flanges located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Therefore, the probability of misalignment of these valves, once they have been verified to be in the proper position, is small.

D.1 and D.2

If the Required Actions and associated Completion Times are not met or if the 42 inch penetration (supply or exhaust) purge valves are open and the 6 inch penetration (pressure or vacuum relief) valves are open simultaneously, 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. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1

This SR ensures that the 42 inch purge supply and exhaust valves and 6 inch pressure and vacuum relief valves are closed as required or, if open, open for an allowable reason. If a valve is open in violation of this SR, the valve is considered inoperable. If the inoperable valve is not otherwise known to have excessive leakage when closed, it is not considered to have leakage outside of limits. The SR is not required to be met when the valves are open for

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SURVEILLANCE REQUIREMENTS

SR 3.6.3.1 (continued)

safety related considerations (equipment or personnel) to support plant operations and maintenance activities within containment. Examples of this may include operating the valves to reduce activity to increase stay times, eliminate the need for respiratory protective equipment, reduce ambient temperatures during hot months, to increase the effectiveness of workers and to minimize occupational effects of necessary, non-routine activities in containment, or for Surveillances that require the valves to be open. The valves are capable of closing in the environment following a LOCA. Therefore, these valves are allowed to be open for limited periods of time. The 31 day Frequency is consistent with other containment isolation valve requirements discussed in SR 3.6.3.3. Since it is not operationally necessary, it is desirable to preclude the 42 inch valves and 6 inch valves from being open at the same time. A Note to this SR restricts the 6 inch and 42 inch valves from being open simultaneously.

SR 3.6.3.2

This SR requires verification that each containment isolation manual valve and blind flange located outside containment and not locked, sealed or otherwise secured and required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside of the containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those containment isolation valves outside containment and capable of being mispositioned are in the correct position. Since verification of valve position for containment isolation valves outside containment is relatively easy, the 31 day Frequency is applicable to containment isolation valves (except Penetration Pressurization System valves with a diameter ≤ 3/8 inch) and blind flanges. The 18 month Frequency is applicable to Penetration Pressurization System valves with a diameter ≤ 3/8 inch. These Frequencies are based on engineering judgment and were chosen to provide added assurance of the correct positions. The 18 month Frequency for Penetration Pressurization System valves ≤ 3/8 inch in diameter is considered acceptable based on the low

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SURVEILLANCE REQUIREMENTS

SR 3.6.3.2 (continued)

probability of these valves being mispositioned and the minimal consequences associated with mispositioning one of these valves. The SR specifies that containment isolation valves that are open under administrative controls are not required to meet the SR during the time the valves are open. This SR does not apply to valves that are locked, sealed or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing or securing.

The Note applies to valves and blind flanges located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted during MODES 1, 2, 3 and 4 for ALARA reasons. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in the proper position, is small.

SR 3.6.3.3

This SR requires verification that each containment isolation manual valve and blind flange located inside containment and not locked, sealed or otherwise secured and required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside of the containment boundary is within design limits. For containment isolation valves inside containment, the Frequency of "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is appropriate since these containment isolation valves are operated under administrative controls and the probability of their misalignment is low. The SR specifies that containment isolation valves that are open under administrative controls are not required to meet the SR during the time they are open. This SR does not apply to valves that are locked, sealed or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing or securing.

This Note allows valves and blind flanges located in high radiation areas to be verified closed by use of

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SURVEILLANCE REQUIREMENTS

SR 3.6.3.3 (continued)

administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted during MODES 1, 2, 3, and 4, for ALARA reasons. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in their proper position, is small.

SR 3.6.3.4

Verifying that the isolation time of each automatic power operated containment isolation valve is within limits is required to demonstrate OPERABILITY. The isolation time test ensures the valve will isolate in a time period less than or equal to that assumed in the safety analyses. The isolation time and Frequency of this SR are in accordance with the Inservice Testing (IST) Program. In addition to the IST program testing frequency, the 42 inch purge supply and exhaust valves will be tested prior to use if not tested within the previous quarter. Otherwise, the 42 inch purge supply and exhaust valves are not cycled quarterly only for testing purposes.

SR 3.6.3.5

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures that each automatic containment isolation valve will actuate to its isolation position on a containment isolation signal. This surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. 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 that these components usually pass this Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.6

Verifying that each 42 inch inboard containment purge valve is blocked to restrict opening to ≤ 70° is required to ensure that the valves can close under DBA conditions within the times assumed in the analyses of References 1 and 2. If a LOCA occurs, the purge valves must close to maintain containment leakage within the values assumed in the accident analysis. At other times when purge valves are required to be capable of closing (e.g., during movement of irradiated fuel assemblies), pressurization concerns are not present, thus the purge valves can be fully open. The 18 month Frequency is appropriate because the blocking devices are typically removed only during a refueling outage.

REFERENCES

1. UFSAR, Chapter 15.
2. UFSAR, Section 6.2.
3. Standard Review Plan 6.2.4.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.9.2

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

SR 3.7.9.3

This SR verifies that each CREFS train starts and operates on an actual or simulated actuation signal. The Frequency of 18 months is consistent with Position C.5 of Regulatory Guide 1.52 (Ref. 4). The 18 month Frequency is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

SR 3.7.9.4

This SR verifies the integrity of the control room envelope, and the assumed inleakage rates of the potentially contaminated air. The control room positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the CREFS. During the emergency pressurization mode of operation, the CREFS is designed to pressurize the control room ≥ 0.125 inches water gauge positive pressure with respect to the outside atmosphere and maintain a positive pressure with respect to adjacent building areas in order to prevent unfiltered inleakage. The CREFS is designed to maintain this positive pressure with one train at a makeup flow rate of ≤ 400 cfm. The Frequency of 18 months on a STAGGERED TEST BASIS is consistent with the guidance provided in NUREG-0800 (Ref. 5).

REFERENCES

1. UFSAR, Section 6.4.
2. UFSAR Section 6.4.2.3.

(continued)

BASES

REFERENCES (continued)

3. UFSAR, Chapter 15.

4. Regulatory Guide 1.52, Rev. 2, March 1978.

5. NUREG-0800, Section 6.4, Rev. 2, July 1981.

BASES

LCO (continued)

c. The associated piping and permanent protective enclosures (e.g., north header enclosure grating), valves, and instrumentation and controls required to perform the safety related function are OPERABLE.

The SWS Turbine Building loop isolation valves are considered OPERABLE when each header isolation valve and the isolation valve powered from the automatic bus transfer switch are OPERABLE.

APPLICABILITY

In MODES 1, 2, 3, and 4, the SWS is a normally operating system that is required to support the OPERABILITY of the equipment serviced by the SWS and required to be OPERABLE in these MODES.

In MODES 5 and 6, the OPERABILITY requirements of the SWS are determined by the systems it supports.

ACTIONS

A.1

If one SWS train is inoperable, action must be taken to restore OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE SWS train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE SWS train could result in loss of SWS function. Required Action A.1 is modified a Note. The Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," should be entered if an inoperable SWS train results in an inoperable emergency diesel generator. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

B.1 and B.2

If one SWS Turbine Building loop isolation valve is inoperable, the valve must be closed and deactivated within 72 hours. In the closed and deactivated condition, the remaining OPERABLE loop isolation valves can perform the

(continued)

BASES

REFERENCES (continued)

5. IEEE-279-1968.
6. 10 CFR 50.49.
7. UFSAR, Section 6.2.4.
8. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.
9. EGR-NGGC-0153, “Engineering Instrument Setpoints.”

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.15.3, SR 3.4.15.4, and SR 3.4.15.5

These SRs require the performance of a CHANNEL CALIBRATION for each of the required RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The Frequency of 18 months is a typical refueling cycle and considers channel reliability.

Again, operating experience has proven that this Frequency is acceptable.

REFERENCES

1. UFSAR, Section 3.1.
2. UFSAR, Section 5.2.

BASES

APPLICABILITY (continued)

In MODES 5 and 6, plant conditions are such that the risk significance of loss of seal injection to the RCPs is significantly reduced. Therefore, CVCS OPERABILITY requirements in these MODES are not maintained in Technical Specifications.

ACTIONS

A.1

With one required charging pump inoperable, the inoperable pump must be returned to OPERABLE status within 24 hours. The 24 hour Completion Time is reasonable, based upon the original licensing basis.

B.1

With one Makeup Water Pathway inoperable, the inoperable components must be returned to OPERABLE status within 24 hours. The 24 hour Completion Time is consistent with the time permitted to restore an inoperable charging pump to OPERABLE status. Because there are two means of establishing Makeup Water Pathways, the remaining OPERABLE pathway will provide the required source of makeup water.

C.1 and C.2

If the inoperable components identified in Required Actions A.1 and B.1 cannot be returned to OPERABLE status within the associated 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 MODE 3 within 6 hours and MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

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

If seal injection to any RCP is not within limit and both required charging pumps are inoperable, adequate makeup to the RCP seals is not assured. In addition, adequate makeup to the RCS is not assured and the RCS inventory will begin to reduce. Backup cooling is provided to the RCP seals by the Component Cooling Water System. Since adequate means of

(continued)

ACTIONS (continued)

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

adding boron to the RCS to achieve cold shutdown conditions are also not available, it is imprudent to bring the plant to MODE 5 where the LCO no longer applies. Therefore, Required Action D.1 requires that action be initiated to restore seal injection to the RCPs to within limits immediately. Required Actions D.2 and D.3 require that the plant be brought to MODE 3 within 6 hours and be depressurized to a pressure < 1400 psig within 12 hours. At this pressure, the Safety Injection (SI) system can be used to maintain RCS inventory until charging can be reestablished. The allowed Completion Times for Required Actions D.2 and D.3 are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

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

If seal injection to any RCP is not within limit and one required charging pump is OPERABLE, adequate makeup to the RCP seals is not assured. Backup cooling is provided to the RCP seals by the component cooling water system. The plant must be brought to a condition where the LCO no longer applies. Required Action E.1 requires that action be initiated to restore seal injection to the affected RCP(s) immediately. Required Actions E.2 and E.3 require that the plant be brought to MODE 3 in 6 hours and MODE 5 in 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

F.1 and F.2

If both Makeup Water Pathways from the RWST are inoperable, adequate makeup to the RCP seals is not assured. Backup cooling is provided to the RCP seals by the Component Cooling Water System. The plant must be brought to a condition where the LCO no longer applies. The allowed Completion Times for Required Actions F.1 and F.2 are reasonable, based on operating experience, to reach the

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

This SR verifies the OPERABILITY of the MSSVs by the verification of each MSSV lift setpoint in accordance with the Inservice Testing Program. The ASME Code, Section XI (Ref. 5), requires that safety and relief valve tests be performed in accordance with ASME OM Code (Ref. 6). According to Reference 6, the following tests are required:

a. Visual examination;

b. Seat tightness determination;

c. Setpoint pressure determination (lift setting);

d. Compliance with owner's seat tightness criteria; and

The ASME OM Code requires that all valves be tested every 5 years, and a minimum of 20% of the valves be tested every 24 months. The ASME Code specifies the activities and frequencies necessary to satisfy the requirements. Table 3.7.1-2 allows a ± 3% setpoint tolerance for OPERABILITY; however, the valves are reset to ± 1% during the Surveillance to allow for drift. The lift settings, according to Table 3.7.1-2, correspond to ambient conditions of the valve at nominal operating temperature and pressure.

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. The MSSVs may be either bench tested or tested in situ at hot conditions using an assist device to simulate lift pressure. If the MSSVs are not tested at hot conditions, the lift setting pressure shall be corrected to ambient conditions of the valve at operating temperature and pressure.

REFERENCES

1. UFSAR, Section 10.3.2.

2. ASME, Boiler and Pressure Vessel Code, Section III.

3. UFSAR, Section 15.2.

(continued)

BASES

REFERENCES (continued)

4. NRC Information Notice 94-60, "Potential Overpressure of Main Steam System," August 22, 1994.
5. ASME, Boiler and Pressure Vessel Code, Section XI.
6. ASME OM Code.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.2.1 (continued)

containment analyses with the exception of closure of the MSIVs for a MSLB at 100% RTP, in which case MSIV closure in 2 seconds is assumed for MSIVs which close in the forward flow direction. The MSIVs should not be tested at power, since even a part stroke exercise increases the risk of a valve closure when the unit is generating power. As the MSIVs are not tested at power, they are exempt from the ASME Code, Section XI (Ref. 5), requirements during operation in MODE 1 or 2.

The Frequency is in accordance with the Inservice Testing Program. The specified Frequency for valve closure time is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the specified Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

This test is conducted in MODE 3 with the unit at operating temperature and pressure, as discussed in Reference 5 exercising requirements. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated.

REFERENCES

1. UFSAR, Section 10.3.
2. UFSAR, Section 6.2.
3. UFSAR, Section 15.1.5.
4. Deleted.
5. ASME, Boiler and Pressure Vessel Code, Section XI.

B 3.7 PLANT SYSTEMS

B 3.7.9 Control Room Emergency Filtration System (CREFS)

BASES

BACKGROUND

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

The CREFS is a subsystem of the Control Room Air Conditioning System and consists of redundant air cleaning unit fans, redundant air intake dampers and associated ductwork, redundant air recirculation fans and associated ductwork, redundant air exhaust dampers, a non-redundant air filtration unit housing, and non-redundant ductwork and gravity dampers. The necessary instrumentation is also considered a part of the system. The air filtration unit housing contains a prefilter, a high efficiency particulate air (HEPA) filter bank, and an activated charcoal adsorber section for removal of gaseous activity (principally iodines). A second bank of HEPA filters follows the adsorber section to collect carbon fines and provides backup in case of failure of the main HEPA filter bank.

The control room envelope (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 areas to which personnel access is 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 analysis of design basis accident (DBA) consequences to CRE occupants. The CRE and its boundary are defined in the Control Room Envelope Habitability Program.

The CREFS is an emergency system, parts of which also operate during normal unit operations in the standby mode of operation. Upon receipt of the actuating signal(s), the stream of ventilation air is recirculated through the system filters. The prefilters remove any large particles in the air, and any entrained water droplets present, to prevent

(continued)

BASES

BACKGROUND (continued)

excessive loading of the HEPA filters and charcoal adsorbers.

The CREFS is actuated to the emergency pressurization mode of operation on a safety injection signal. A single area radiation monitor also provides a signal to the CREFS to actuate emergency pressurization. Upon actuation, the air recirculation fans start and move recirculation air through the air cleaning unit filter train, and the control room exhaust to the outdoors is isolated.

The control room envelope is maintained under a positive differential pressure with respect to adjacent areas and the outdoors during the emergency pressurization mode of operation. A maximum makeup rate of 400 CFM is provided for pressurizing the control room envelope. Periodic testing is required to demonstrate that the control room is pressurized to a minimum of 0.125 inches water gage with respect to the outdoors, and to a positive pressure with respect to adjacent areas, with an outside air makeup rate of $\leq$ 400 CFM, while in the emergency pressurization mode of operation. Periodic testing also demonstrates that a positive pressure can be maintained in the control room with respect to the outdoors. The CREFS operation in maintaining the control room habitable is discussed in the Updated Final Safety Analysis Report (UFSAR), Section 6.4 (Ref. 1).

Pressurization of the control room habitability envelope by the CREFS assumes that non-safety related ventilation fans in the Auxiliary Building adjacent to the control room either remain in operation or cease operation. In the event that the air supply fan to the Auxiliary Building remains in operation simultaneously with the Auxiliary Building air exhaust fan not in operation, one room of the Auxiliary Building (i.e., Hagan Room) could be slightly positive with respect to the control room. Procedures require that the air supply fan to the Auxiliary Building be shut down within one hour of actuation of the CREFS to assure that the air pressure in the Auxiliary Building is reduced. Analyses show that the dose to the control room operator is satisfactory under this condition (Ref. 2).

The air entering the control room through the outside air intake is continuously monitored for radiation in the control room and smoke in the ventilation air duct.

The CREFS is designed to maintain the control room environment for 30 days of continuous occupancy after a

(continued)

BASES

| | |
|---|---|
| BACKGROUND (continued) | Design Basis Accident (DBA) without exceeding a 5 rem total effective dose equivalent (TEDE). |

APPLICABLE SAFETY ANALYSES

The active CREFS 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 CREFS provides airborne radiological protection for the control room occupants, as demonstrated by the control room accident dose analyses for the design basis accidents.

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

The CREFS satisfies Criterion 3 of the NRC Policy Statement.

LCO

Two redundant CREFS trains 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.

The CREFS is considered OPERABLE when the individual components necessary to limit operator exposure are OPERABLE in both trains. A CREFS train is OPERABLE when the air cleaning unit fan, air recirculation fan, air intake damper and associated ductwork, and air exhaust damper and associated ductwork, are operable for the given train. The common air filtration unit is OPERABLE to support either train in accordance with the Ventilation Filter Testing Program. In addition, non-redundant ductwork and gravity dampers are OPERABLE to support either train.

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

(continued)

BASES

LCO (continued)

The LCO is modified by a Note allowing the CRE boundary to be opened intermittently under administrative control. This Note only applies to openings that can be rapidly restored to the design condition (e.g., doors, access panels). For entry and exit through doors, the administrative control of the opening is performed by the person(s) entering or exiting. For other openings, the control will be proceduralized and consist of stationing an individual at the opening with continuous communication capability with operators in the CRE and the ability to rapidly close the opening and restore the CRE boundary to a condition equivalent to the design condition when the need is indicated.

APPLICABILITY

In MODES 1, 2, 3, 4, and during movement of irradiated fuel assemblies, CREFS must be OPERABLE to control occupant exposure during and following a DBA. Applicability to movement of irradiated fuel excludes movement of irradiated fuel within a properly sealed spent fuel shipping/storage cask.

ACTIONS

A.1

When one CREFS train is inoperable, for reasons other than an inoperable CRE boundary, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CREFS train is adequate to perform the CRE occupant protection function. However, the overall reliability is reduced because a failure in the OPERABLE CREFS train could result in loss of CREFS function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability.

B.1 and B.2

In MODE 1, 2, 3, or 4, if the inoperable CREFS train cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in

(continued)

BASES

ACTIONS (continued)

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.

C.1 and C.2

During movement of irradiated fuel assemblies, if the inoperable CREFS train cannot be restored to OPERABLE status within the required Completion Time, action must be taken to immediately place the OPERABLE CREFS train in the emergency pressurization mode. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure would be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

D.1

During movement of irradiated fuel assemblies, with two CREFS trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the control room. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

E.1

If both CREFS trains are inoperable in MODE 1, 2, 3, or 4, for reasons other than an inoperable CRE boundary, action must be taken to restore OPERABLE status of at least one CREFS train within 48 hours. The 48 hour completion time is based upon the low probability of a DBA occurring during this time.

(continued)

BASES

ACTIONS (continued)

F.1 and F.2

In MODE 1, 2, 3, or 4, if both inoperable (for reasons other than an inoperable CRE boundary) CREFS trains cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes 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.

G.1, G.2, and G.3

If the CRE boundary is inoperable as defined in the CRE Habitability Program, then actions must be taken to restore an OPERABLE CRE boundary within 90 days.

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.

(continued)

BASES

ACTIONS (continued)

H.1

In MODE 1, 2, 3, or 4, if the inoperable CRE boundary cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes 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.

SURVEILLANCE REQUIREMENTS

SR 3.7.9.1

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 once every month provides an adequate check of this system. Operation for ≥ 15 minutes is adequate to demonstrate the function of the system. The 31 day Frequency is based on the reliability of the equipment and the two train redundancy availability.

SR 3.7.9.2

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

SR 3.7.9.3

This SR verifies that each CREFS train starts and operates on an actual or simulated actuation signal. The Frequency of 18 months is consistent with Position C.5 of Regulatory Guide 1.52 (Ref. 4). The 18 month Frequency is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.9.4

This SR verifies the integrity of the CRE boundary. The CRE Habitability Program specifies administrative controls for temporary breaches to the boundary, preventative maintenance requirements to ensure the boundary is maintained, and leak test surveillance requirements. The details and frequencies for these requirements are specified in the CRE Habitability Program.

REFERENCES

1. UFSAR, Section 6.4.
2. UFSAR Section 6.4.2.3.
3. UFSAR, Chapter 15.
4. Regulatory Guide 1.52, Rev. 2, March 1978.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.11.3 (continued)

permit cask egress, ISTS SR 3.7.13.4 cannot be met. OPERABILITY of the FBACS is not necessary when irradiated fuel assemblies are in a spent fuel shipping cask because irradiated fuel assemblies are protected from damage and associated release of fission products by the cask and other controls associated with shipments of spent fuel assemblies. The terms "shipping cask" and "shipment" used within this specification and bases also applies to the transfer cask/dry fuel storage container used to transfer fuel to the onsite Independent Spent Fuel Storage Installation (ISFSI).

REFERENCES

1. UFSAR, Section 6.5.1.
2. UFSAR, Section 9.4.5.
3. UFSAR, Section 15.7.4.
4. 10 CFR 50.67.
5. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.
6. Licensee Event Report (LER) 50-26/97-05, dated May 22, 1997.
7. Deleted.
8. Regulatory Guide 1.183.

# B 3.9 REFUELING OPERATIONS

## B 3.9.2 Nuclear Instrumentation

BASES

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BACKGROUND

The source range neutron flux monitors are used during refueling operations to monitor the core reactivity condition. The installed source range neutron flux monitors are part of the Nuclear Instrumentation System (NIS). These detectors are located external to the reactor vessel and detect neutrons leaking from the core.

The installed source range neutron flux monitors are BF3 detectors operating in the proportional region of the gas filled detector characteristic curve. The detectors monitor the neutron flux in counts per second. The instrument range covers six decades of neutron flux (1E+6 cps) with a 5% instrument accuracy. The detectors also provide continuous visual indication in the control room and an audible alarm to alert operators to a possible dilution accident. The NIS is designed in accordance with the criteria presented in the UFSAR Section 3.1 (Ref. 1).

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APPLICABLE SAFETY ANALYSES

Two OPERABLE source range neutron flux monitors are required to provide a signal to alert the operator to unexpected changes in core reactivity such as with a boron dilution accident (Ref. 2) or an improperly loaded fuel assembly.

The source range neutron flux monitors satisfy Criterion 3 of the NRC Policy Statement.

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LCO

This LCO requires that two source range neutron flux monitors be OPERABLE to ensure that redundant monitoring capability is available to detect changes in core reactivity. For the purposes of this LCO, OPERABILITY of the source range flux monitors includes both channels with continuous visual count rate indication in the control room. Additionally, during periods of core alteration, one channel shall have an audible count rate indication available in the containment.

(continued)