3.7 PLANT SYSTEMS

3.7.10 Control Room Emergency Filtration/Pressurization System (CREFS)

LCO 3.7.10 Two CREFS trains shall be OPERABLE.

---------- NOTE ----------
The CREFS boundary may be opened intermittently under administrative control.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CREFS train inoperable.	A.1 Restore CREFS train to OPERABLE status.	7 days
B. Two CREFS trains inoperable due to inoperable control room boundary in MODE 1, 2, 3, or 4.	B.1 Restore control room boundary to OPERABLE status.	24 hours
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours
D. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies or during CORE ALTERATIONS.	D.1 Place OPERABLE CREFS train in emergency recirculation mode. OR D.2.1 Suspend CORE ALTERATIONS. AND	Immediately Immediately

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. (continued)	D.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
E. Two CREFS trains inoperable during movement of irradiated fuel assemblies or during CORE ALTERATIONS.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E.2	Suspend movement of irradiated fuel assemblies.	Immediately
F. Two CREFS trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	F.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Operate each CREFS Pressurization train for ≥ 10 continuous hours with the heaters operating and each CREFS Recirculation and Filtration train for ≥ 15 minutes.	31 days
SR 3.7.10.2	Perform required CREFS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with VFTP
SR 3.7.10.3	----------NOTE---------- Not required to be performed in MODES 5 and 6. ---------- Verify each CREFS train actuates on an actual or simulated actuation signal.	18 months
SR 3.7.10.4	Verify one CREFS train can maintain a positive pressure of ≥ 0.125 inches water gauge, relative to the outside atmosphere during system operation.	18 months

3.7 PLANT SYSTEMS

3.7.12 Penetration Room Filtration (PRF) System

LCO 3.7.12 Two PRF trains shall be OPERABLE.

---------- NOTE ----------

The PRF and Spent Fuel Pool Room (SFPR) boundaries may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, and 4 for post LOCA mode of operation,
During movement of irradiated fuel assemblies in the SFPR for the fuel handling accident mode of operation.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One PRF train inoperable.	A.1	Restore PRF train to OPERABLE status.	7 days
B. Two PRF trains inoperable in MODE 1, 2, 3, or 4 due to inoperable PRF boundary.	B.1	Restore PRF boundary to OPERABLE status.	24 hours
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4. OR Two PRF trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	C.1 AND C.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours
D. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the SFPR.	D.1 OR D.2	Place OPERABLE PRF train in operation. Suspend movement of irradiated fuel assemblies in the SFPR.	Immediately Immediately

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two PRF trains inoperable during movement of irradiated fuel assemblies in the SFPR.	E.1 Suspend movement of irradiated fuel assemblies in the SFPR.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.12.1	----------NOTE---------- Only required to be performed during movement of irradiated fuel assemblies in the SFPR. ---------- Verify two PRF trains aligned to the SFPR.	24 hours
SR 3.7.12.2	Operate each PRF train for ≥ 15 minutes in the applicable mode of operation (post LOCA and/or refueling accident).	31 days
SR 3.7.12.3	Perform required PRF filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.12.4	Verify each PRF train actuates and the normal spent fuel pool room ventilation system isolates on an actual or simulated actuation signal.	18 months
SR 3.7.12.5	Verify one PRF train can maintain a pressure ≤ -0.125 inches water gauge with respect to adjacent areas during the post LOCA mode of operation at a flow rate ≤ 5500 cfm.	18 months on a STAGGERED TEST BASIS
SR 3.7.12.6	Verify one PRF train can maintain a slightly negative pressure with respect to adjacent areas during the fuel handling accident mode of operation at a flow rate ≤ 5500 cfm.	18 months on a STAGGERED TEST BASIS

BASES

LCO

Two independent and redundant CREFS trains are required to be OPERABLE to ensure that at least one is available assuming a single failure disables the other train. Total system failure could result in exceeding a dose of 5 rem to the control room operator 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 associated:

a. Fans are OPERABLE; (recirculation, filtration, Pressurization, and CRACS Fans)

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

c. Heater, ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.

In addition, the control room boundary must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors.

The LCO is modified by a Note allowing the control room boundary to be opened intermittently under administrative controls. For entry and exit through doors the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, such as hatches and inspection ports, these controls consist of stationing a dedicated individual at the opening who is in continuous communication with the control room. This individual will have a method to rapidly close the opening when a need for control room isolation is indicated.

APPLICABILITY

With either unit in MODES 1, 2, 3, or 4 or during movement of irradiated fuel assemblies or during CORE ALTERATIONS, CREFS must be OPERABLE to control operator exposure during and following a DBA.

During movement of irradiated fuel assemblies and CORE ALTERATIONS, the CREFS must be OPERABLE to cope with the release from a fuel handling accident.

BASES

ACTIONS

A.1

When one CREFS train is inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CREFS train is adequate to perform the control room protection function. However, the overall reliability is reduced because a single 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

If the control room boundary is inoperable in MODE 1, 2, 3, or 4, the CREFS trains cannot perform their intended functions. Action must be taken to restore an OPERABLE control room boundary within 24 hours. During the period that the control room boundary is inoperable, appropriate compensatory measures (consistent with the intent of GDC 19) should be utilized to protect control room operators from potential hazards such as radioactive contamination, toxic chemicals, smoke, temperature and relative humidity, and physical security. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of compensatory measures. The 24 hour Completion Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the control room boundary.

C.1 and C.2

In MODE 1, 2, 3, or 4, if the inoperable CREFS train or control room 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.

(continued)

BASES

ACTIONS (continued)

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

During movement of irradiated fuel assemblies or during CORE ALTERATIONS, 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 recirculation 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 D.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.

E.1 and E.2

During movement of irradiated fuel assemblies or during CORE ALTERATIONS, 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.

F.1

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

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

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 (CREFS and Pressurization) once every month provides an adequate check of this system. The CREFS trains are initiated from the control room with flow through the HEPA and charcoal filters. Monthly heater operations dry out any moisture accumulated in the charcoal from

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1 (continued)

humidity in the ambient air. Systems with heaters must be operated for ≥ 10 continuous hours with the heaters energized. Systems without heaters need only be operated for ≥ 15 minutes 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 3.7.10.2

This SR verifies that the required CREFS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREFS filter tests are in accordance with ASME N510-1989 (Ref. 3). The VFTP includes testing the performance of the HEPA filter, charcoal adsorber efficiency, flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.10.3

This SR verifies that each CREFS train starts and operates on an actual or simulated Safety Injection (SI) actuation signal. The Frequency of 18 months is specified in Regulatory Guide 1.52 (Ref. 4). This SR is modified by a note which provides an exception to the requirement to meet this SR in MODES 5 and 6. This is acceptable since the automatic SI actuation function is not required in these MODES.

SR 3.7.10.4

This SR verifies the integrity of the control room enclosure, and the assumed inleakage rates of the potentially contaminated air. The control room positive pressure, with respect to atmosphere, is periodically tested to verify proper functioning of the CREFS. During the emergency 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 in order to prevent unfiltered inleakage. The CREFS is designed to maintain this positive pressure with one train. The Frequency of 18 months is adequate and has been shown to be acceptable by operating experience.

BASES

REFERENCES

1. FSAR, Section 6.4.
2. FSAR, Chapter 15.
3. ASME N510-1989.
4. Regulatory Guide 1.52, Rev. 2.

BASES

LCO (continued)

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

c. Ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.

The LCO is modified by a Note allowing the PRF or spent fuel pool room (SFPR) boundary to be opened intermittently under administrative controls without requiring entry into Conditions B or E for an inoperable pressure boundary. For entry and exit through doors the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, such as hatches and inspection ports, these controls consist of stationing a dedicated individual at the opening who is in continuous communication with the control room. This individual will have a method to rapidly close the opening when a need for PRF or SFPR ventilation actuation is indicated. Breaches that would prevent successful completion of SR 3.7.12.6 render the SFPR boundary inoperable. When the SFPR boundary is inoperable Condition E will prohibit movement of irradiated fuel. For loads other than irradiated fuel, administrative controls will prevent movement of loads over irradiated fuel unless adequate decay time for the irradiated fuel has elapsed such that occurrence of a fuel handling accident without air filtration will not exceed dose limits. Calculations show that a decay time of 676 hours is sufficient.

APPLICABILITY

In MODE 1, 2, 3, or 4, the PRF System is required to be OPERABLE to provide fission product removal associated with ECCS leaks due to a LOCA.

In MODE 5 or 6, the PRF System is not required to be OPERABLE since the ECCS is not required to be OPERABLE.

During movement of irradiated fuel in the spent fuel pool area, two trains of PRF are required to be OPERABLE and aligned to the spent fuel pool room to alleviate the consequences of a fuel handling accident.

ACTIONS

A.1

With one PRF train inoperable, action must be taken to restore OPERABLE status within 7 days. During this period, the remaining OPERABLE train is adequate to perform the PRF function. The 7 day Completion Time is based on the risk from an event occurring requiring the inoperable PRF train, and the remaining PRF train providing the required protection.

(continued)

BASES

ACTIONS (continued)

B.1

If the PRF system is inoperable due to a penetration room boundary being inoperable in MODE 1, 2, 3, or 4, the PRF trains cannot perform their intended functions. Action must be taken to restore the PRF boundary within 24 hours. During the period the PRF boundary is inoperable, appropriate compensatory measures (consistent with the intent of GDC 19) should be utilized to protect control room operators from potential radiological hazards. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour Completion Time for the post LOCA mode of operation is reasonable based on the low probability of a DBA occurring during this time period, and the use of compensatory measures. It provides a reasonable time to diagnose, plan and possibly repair, and test most problems with the PRF boundary.

C.1 and C.2

In MODE 1, 2, 3, or 4, when Required Action A.1 or B.1 cannot be completed within the associated Completion Time, or when both PRF trains are inoperable, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in MODE 3 within 6 hours, and in MODE 5 within 36 hours. The 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.

D.1 and D.2

When Required Action A.1 cannot be completed within the required Completion Time, during movement of irradiated fuel assemblies in the spent fuel pool room, the OPERABLE PRF train must be started immediately or fuel movement suspended. This action ensures that the remaining train is OPERABLE, that no undetected failures preventing system operation will occur, and that any active failure will be readily detected.

If the system is not placed in operation, this action requires suspension of fuel movement, which precludes a fuel handling accident. This does not preclude the movement of fuel assemblies to a safe position.

(continued)

BASES

ACTIONS (continued)

E.1

When two trains of the PRF System are inoperable during movement of irradiated fuel assemblies in the spent fuel pool room, action must be taken to place the unit in a condition in which the LCO does not apply. Action must be taken immediately to suspend movement of irradiated fuel assemblies in the spent fuel pool room. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1

During movement of irradiated fuel in the spent fuel pool room, the two PRF trains are required to be aligned to the spent fuel pool room. When moving irradiated fuel, periodic verification of the PRF system alignment is required. During movement of irradiated fuel the potential exists for a fuel handling accident. Verification of the PRF train alignment when moving irradiated fuel provides assurance the correct system alignment is maintained to support the assumptions of the fuel handling accident analysis regarding the OPERABILITY of the PRF System. The 24-hour Frequency specified for this verification is adequate to confirm the PRF System alignment and has been shown to be acceptable by operating experience. This surveillance is modified by a note which clarifies that the surveillance need only be performed during the movement of irradiated fuel in the spent fuel pool room.

SR 3.7.12.2

Standby systems should be checked periodically to ensure that they function properly. As the environmental and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system. This Surveillance requires that the operation of the PRF System be verified in the applicable alignment (post LOCA and/or refueling accident). The surveillance is applied separately to each operating mode of the PRF System as required by plant conditions. In MODE 1-4, operational testing in the post LOCA alignment is required to verify the capability of the system to perform in this capacity. Operational testing of the PRF System in the refueling accident alignment is only required to be performed to support the movement of irradiated fuel in the spent fuel pool storage room (when the potential exists for a fuel handling accident).

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.12.2 (continued)

Systems that do not credit the operation of heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system. The system is initiated from the control room with flow through the HEPA and charcoal filters. The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy available.

SR 3.7.12.3

This SR verifies that the required PRF System testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The PRF System filter tests are in accordance with ASME N510-1989 (Ref. 6). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.12.4

This SR verifies that each PRF train starts and operates on an actual or simulated Phase B actuation signal. In addition, the normal spent fuel pool ventilation system must be verified to isolate on an actual or simulated spent fuel pool ventilation low differential pressure signal and on an actual or simulated spent fuel pool high radiation signal. The 18 month Frequency is consistent with Reference 7.

SR 3.7.12.5

This SR verifies the integrity of the ECCS pump rooms and penetration area boundary. The ability of the boundary to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper function of the PRF System. During the post-LOCA mode of operation, the PRF System is designed to maintain a slight negative pressure in the ECCS pump rooms and penetration area boundary, to prevent unfiltered LEAKAGE. The PRF System is designed to maintain ≤ -0.125 inches water gauge with respect to adjacent area pressure (as measured by the ΔP between the PRF mechanical equipment room and the RHR Heat Exchanger Room) at a flow rate of ≤ 5,500 cfm.

An 18 month Frequency (on a STAGGERED TEST BASIS) is consistent with Reference 7.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.6

During the fuel handling mode of operation, the PRF is designed to maintain a slightly negative pressure in the spent fuel pool room with respect to atmospheric pressure and surrounding areas at a flow rate of ≤ 5,500 cfm, to prevent unfiltered leakage. The slightly negative pressure is verified by using a non-rigorous method that yields some observable identification of the slightly negative pressure. Examples of non-rigorous methods are smoke sticks, hand held differential pressure indicators, or other measurement devices that do not provide for an absolute measurement.

REFERENCES

1. FSAR, Section 6.2.3.
2. FSAR, Section 9.4.2.
3. FSAR, Sections 15.4.1 and 15.4.5.
4. Regulatory Guide 1.25.
5. 10 CFR 100.
6. ASME N510-1989.
7. Regulatory Guide 1.52 (Rev. 2).