ENCLOSURE 1

PROPOSED TECHNICAL SPECIFICATIONS REVISIONS

BROWNS FERRY NUCLEAR PLANT

UNITS 1, 2, AND 3

(TVA BFN TS 240)

2. When a system, subsystem, train, component, or device is determined to be inoperable solely because its onsite power source is inoperable, or solely because its offsite power source is operable, it may be considered operable for the purpose of satisfying the requirements of its applicable Limiting Condition For Operation, provided:

   (1) its corresponding offsite or diesel power source is operable; and (2) all of its redundant system(s), subsystem(s), train(s), component(s), and device(s) are operable, or likewise satisfy these requirements. Unless both conditions (1) and (2) are satisfied, the unit shall be placed in at least Hot Standby within 6 hours, and in at least Cold Shutdown within the following 30 hours. This definition is not applicable in Cold Shutdown or Refueling. This provision describes what additional conditions must be satisfied to permit operation to continue consistent with the specifications for power sources, when an offsite or onsite power source is not operable. It specifically prohibits operation when one division is inoperable because its offsite or diesel power source is inoperable and a system, subsystem, train, component, or device in another division is inoperable for another reason. This provision permits the requirements associated with individual systems, subsystems, trains, components, or devices to be consistent with the requirements of the associated electrical power source. It allows operation to be governed by the time limit of the requirements associated with the Limiting Condition For Operation for the offsite or diesel power source, not the individual requirements for each system, subsystem, train, component, or device that is determined to be inoperable solely because of the inoperability of its offsite or diesel power source.

D. PRIOR TO STARTUP - Prior to withdrawing the first control rod for the purpose of making the reactor critical.

E. Operable - Operability - A system, subsystem, train, component, or device shall be operable or have operability when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s).

F. Operating - Operating means that a system or component is performing its intended functions in its required manner.

G. Immediate - Immediate means that the required action will be initiated as soon as practicable considering the safe operation of the unit and the importance of the required action.

DEFINITIONS (Cont'd)

H. Reactor Power Operation - Reactor power operation is any operation in the STARTUP/HOT STANDBY or RUN MODE with the reactor critical and above 1 percent rated power.

I. STARTUP CONDITION - The reactor is in the STARTUP CONDITION when the withdrawal of control rods for the purpose of making the reactor critical has begun, reactor power is less than or equal to 1 percent of rated, and the reactor is in the STARTUP/HOT STANDBY MODE.

J. HOT STANDBY CONDITION - The reactor is in the HOT STANDBY CONDITION when reactor power is less than or equal to 1 percent of rated. The reactor is in the STARTUP/HOT STANDBY MODE, and the reactor is not in the STARTUP CONDITION. The reactor coolant temperature may be greater than 212° F.

Note that a HOT STANDBY CONDITION cannot exist simultaneously with a STARTUP CONDITION due to the difference in intent. A HOT STANDBY CONDITION exists when the reactor mode switch is placed in the STARTUP/HOT STANDBY position (for example, to comply with an LCO) and power level has been reduced to 1 percent or lower. Anytime control rods are being withdrawn for the purpose of increasing reactor power level, the reactor mode switch has been placed in the STARTUP/HOT STANDBY position, and reactor power level is at or below one percent, a STARTUP CONDITION exists.

K. SHUTDOWN CONDITION - The reactor is in the SHUTDOWN CONDITION when the reactor is in the Shutdown or Refuel Mode.

1. HOT SHUTDOWN CONDITION - The reactor is in the HOT SHUTDOWN CONDITION when reactor coolant temperature is greater than 212° F and the reactor is in the SHUTDOWN CONDITION.

2. COLD SHUTDOWN CONDITION - The reactor is in the COLD SHUTDOWN CONDITION when reactor coolant temperature is equal to or less than 212° F and the reactor is in the SHUTDOWN CONDITION.

L. COLD CONDITION - The reactor is in the COLD CONDITION when reactor coolant temperature is equal to or less than 212° F in any Mode of Operation (except as defined in K.2 above).

DEFINITIONS (Cont'd)

M. Mode of Operation - The reactor mode switch position determines the Mode of Operation of the reactor when there is fuel in the reactor vessel, except that the Mode of Operation may remain unchanged when the reactor mode switch is temporarily moved to another position as permitted by the notes. When there is no fuel in the reactor vessel, the reactor is considered not to be in any Mode of Operation or operational condition. The reactor mode switch may then be in any position or may be INOPERABLE.

1. Startup/Hot Standby Mode - The reactor is in the STARTUP/HOT STANDBY MODE when the reactor mode switch is in the "STARTUP/HOT STANDBY" position. This is often referred to as just the STARTUP MODE.(1)

2. Run Mode - The reactor is in the Run Mode when the reactor mode switch is in the "Run" position.

3. Shutdown Mode - The reactor is in the Shutdown Mode when the reactor mode switch is in the "Shutdown" position.(1)(2)(3)(4)

4. Refuel Mode - The reactor is in the Refuel Mode when the reactor mode switch is in the "Refuel" position.(1)

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(1) The reactor mode switch may be placed in any position to perform required tests or maintenance authorized by the shift operations supervisor, provided that the control rods are verified to remain fully inserted by a second licensed operator or other technically qualified member of the unit technical staff.

(2) The reactor mode switch may be placed in the "Refuel" position while a single control rod drive is being removed from the reactor pressure vessel per specification 3.10.A.5 provided that reactor coolant temperature is equal to or less than 212° F.

(3) The reactor mode switch may be placed in the "Refuel" position while a single control rod is being recoupled or withdrawn provided that the one-rod-out interlock is operable.

(4) The reactor mode switch may be placed in the "Startup/Hot Standby" position and withdrawal of selected control rods is permitted for the purpose of determining the operability of the RSCS and RWM prior to withdrawal of control rods for the purpose of bringing the reactor to criticality.

1.0 DEFINITIONS (Cont'd)

Q. Operating Cycle - Interval between the end of one refueling outage for a particular unit and the end of the next subsequent refueling outage for the same unit.

R. Refueling Outage - Refueling outage is the period of time between the shutdown of the unit prior to a refueling and the startup of the unit after that refueling. For the purpose of designating frequency of testing and surveillance, a refueling outage shall mean a regularly scheduled outage; however, where such outages occur within 8 months of the completion of the previous refueling outage, the required surveillance testing need not be performed until the next regularly scheduled outage.

S. CORE ALTERATION - The addition, removal, relocation, or movement of fuel, sources, incore instruments, or reactivity controls within the reactor pressure vessel with the head removed and fuel in the vessel. Normal control rod movement with the control rod drive hydraulic system is not defined as a Core Alteration. Normal movement of in-core instrumentation and the traversing in-core probe is not defined as a Core Alteration. Suspension of Core Alterations shall not preclude completion of the movement of a component to a safe conservative position.

T. Reactor Vessel Pressure - Unless otherwise indicated, reactor vessel pressures listed in the Technical Specifications are those measured by the reactor vessel steam space detectors.

U. Thermal Parameters

1. Minimum Critical Power Ratio (MCPR) - Minimum Critical Power Ratio (MCPR) is the value of the critical power ratio associated with the most limiting assembly in the reactor core. Critical Power Ratio (CPR) is the ratio of that power in a fuel assembly, which is calculated to cause some point in the assembly to experience boiling transition, to the actual assembly operating power.

2. Transition Boiling - Transition boiling means the boiling regime between nucleate and film boiling. Transition boiling is the regime in which both nucleate and film boiling occur intermittently with neither type being completely stable.

3. Core Maximum Fraction of Limiting Power Density (CMFLPD) - The highest ratio, for all fuel types in the core, of the maximum fuel rod power density (kW/ft) for a given fuel type to the limiting fuel rod power density (kW/ft) for that fuel type.

4. Average Planar Linear Heat Generation Rate (APLHGR) - The Average Planar Heat Generation Rate is applicable to a specific planar height and is equal to the sum of the linear heat generation rates for all the fuel rods in the specified bundle at the specified height divided by the number of fuel rods in the fuel bundle.

3.1/4.1 REACTOR PROTECTION SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.1 Reactor Protection System

Applicability

Applies to the instrumentation and associated devices which initiate a reactor scram.

Objective

To assure the operability of the reactor protection system.

Specification

A. When there is fuel in the vessel, the setpoints, minimum number of trip systems, and minimum number of instrument channels that must be OPERABLE for each MODE OF OPERATION shall be as given in Table 3.1.A.

B. Two RPS power monitoring channels for each inservice RPS MG sets or alternate source shall be operable.

1. With one RPS electric power monitoring channel for inservice RPS MG set or alternate power supply inoperable, restore the inoperable channel to operable status within 72 hours or remove the associated RPS MG set or alternate power supply from service.

SURVEILLANCE REQUIREMENTS

4.1 Reactor Protection System

Applicability

Applies to the surveillance of the instrumentation and associated devices which initiate reactor scram.

Objective

To specify the type and frequency of surveillance to be applied to the protection instrumentation.

Specification

A. Instrumentation systems shall be functionally tested and calibrated as indicated in Tables 4.1.A and 4.1.B, respectively.

B. The RPS power monitoring system instrumentation shall be determined operable:

1. At least once per 6 months by performance of channel functional tests.

NOTES FOR TABLE 3.2.F

(1) From and after the date that one of these parameters is reduced to one indication, continued operation is permissible during the succeeding 30 days unless such instrumentation is sooner made operable.

(2) From and after the date that one of these parameters is not indicated in the control room, continued operation is permissible during the succeeding seven days unless such instrumentation is sooner made operable.

(3) If the requirements of notes (1) and (2) cannot be met, and if one of the indications cannot be restored in (6) hours, an orderly shutdown shall be initiated and the reactor shall be in a COLD SHUTDOWN CONDITION within 24 hours.

(4) These surveillance instruments are considered to be redundant to each other.

(5) From and after the date that both the acoustic monitor and the temperature indication on any one valve fails to indicate in the control room, continued operation is permissible during the succeeding 30 days, unless one of the two monitoring channels is sooner made available. If both the primary and secondary indication on any SRV tailpipe is inoperable, the torus temperature will be monitored at least once per shift to observe any unexplained temperature increase which might be indicative of an open SRV.

(6) A channel consists of eight sensors, one from each alternating torus bay. Seven sensors must be operable for the channel to be operable.

LIMITING CONDITIONS FOR OPERATION

3.3.B. Control Rods

1. Each control rod shall be coupled to its drive or completely inserted and the control rod directional control valves disarmed electrically. This requirement does not apply in the SHUTDOWN CONDITION when the reactor is vented. Two control rod drives may be removed as long as Specification 3.3.A.1 is met.

2. The control rod drive housing support system shall be in place during REACTOR POWER OPERATION or when the reactor coolant system is pressurized above atmospheric pressure with fuel in the reactor vessel, unless all control rods are fully inserted and Specification 3.3.A.1 is met.

SURVEILLANCE REQUIREMENTS

4.3.B. Control Rods

1. The coupling integrity shall be verified for each withdrawn control rod as follows:

   a. Verify that the control rod is following the drive by observing a response in the nuclear instrumentation each time a rod is moved when the reactor is operating above the preset power level of the RSCS.

   b. When the rod is fully withdrawn the first time after each refueling outage or after maintenance, observe that the drive does not go to the overtravel position.

2. The control rod drive housing support system shall be inspected after reassembly and the results of the inspection recorded.

LIMITING CONDITIONS FOR OPERATION

3.3.C. Scram Insertion Times

2. The average of the scram insertion times for the three fastest OPERABLE control rods of all groups of four control rods in a two-by-two array shall be no greater than:

% Inserted From Fully Withdrawn	Avg. Scram Insertion Times (sec)
5	0.398
20	0.954
50	2.120
90	3.800

a. The maximum scram insertion time for 90% insertion of any operable control rod shall not exceed 7.00 seconds.

D. Reactivity Anomalies

The reactivity equivalent of the difference between the actual critical rod configuration and the expected configuration during power operation shall not exceed 1% Δk. If this limit is exceeded, the reactor will be placed in the SHUTDOWN CONDITION until the cause has been determined and corrective actions have been taken as appropriate.

SURVEILLANCE REQUIREMENTS

4.3.C. Scram Insertion Times

2. At 16-week intervals, 10% of the OPERABLE control rod drives shall be scram-timed above 800 psig. Whenever such scram time measurements are made, an evaluation shall be made to provide reasonable assurance that proper control rod drive performance is being maintained.

D. Reactivity Anomalies

During the startup test program and startup following refueling outages, the critical rod configurations will be compared to the expected configurations at selected operating conditions. These comparisons will be used as base data for reactivity monitoring during subsequent power operation throughout the fuel cycle. At specific power operating conditions, the critical rod configuration will be compared to the configuration expected based upon appropriately corrected past data. This comparison will be made at least every full power month.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.3.E. If Specifications 3.3.C and .D above cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the SHUTDOWN CONDITION within 24 hours.	4.3.E. Surveillance requirements are as specified in 4.3.C and .D above.
F. Scram Discharge Volume (SDV)	F. Scram Discharge Volume (SDV)
1. The scram discharge volume drain and vent valves shall be operable any time that the reactor protection system is required to be operable except as specified in 3.3.F.2.	1.a. The scram discharge volume drain and vent valves shall be verified open PRIOR TO STARTUP and monthly thereafter. The valves may be closed intermittently for testing not to exceed 1 hour in any 24-hour period during operation.
	1.b. The scram discharge volume drain and vent valves shall be demonstrated operable monthly.
2. In the event any SDV drain or vent valve becomes INOPERABLE, REACTOR POWER OPERATION may continue provided the redundant drain or vent valve is operable.	2. When it is determined that any SDV drain or vent valve is inoperable, the redundant drain or vent valve shall be demonstrated operable immediately and weekly thereafter.
3. If redundant drain or vent valves become INOPERABLE, the reactor shall be in HOT STANDBY CONDITION within 24 hours.	3. No additional surveillance required.

LIMITING CONDITIONS FOR OPERATION

3.5 CORE AND CONTAINMENT COOLING SYSTEMS

Applicability

Applies to the operational status of the core and containment cooling systems.

Objective

To assure the operability of the core and containment cooling systems under all conditions for which this cooling capability is an essential response to plant abnormalities.

Specification

A. Core Spray System (CSS)

1. The CSS shall be OPERABLE:

(1) PRIOR TO STARTUP from a COLD CONDITION, or

(2) when there is irradiated fuel in the vessel and when the reactor vessel pressure is greater than atmospheric pressure, except as specified in Specification 3.5.A.2.

SURVEILLANCE REQUIREMENTS

4.5 CORE AND CONTAINMENT COOLING SYSTEMS

Applicability

Applies to the surveillance requirements of the core and containment cooling systems when the corresponding limiting condition for operation is in effect.

Objective

To verify the operability of the core and containment cooling systems under all conditions for which this cooling capability is an essential response to plant abnormalities.

Specification

A. Core Spray System (CSS)

1. Core Spray System Testing.

	Item	Frequency
a.	Simulated Automatic Actuation test	Once/ Operating Cycle
b.	Pump Operability	Once/ month
c.	Motor Operated Valve Operability	Once/ month
d.	System flow rate: Each loop shall deliver at least 6250 gpm against a system head corresponding to a	Once/3 months

LIMITING CONDITIONS FOR OPERATION

3.5.A Core Spray System (CSS)

2. If one CSS loop is INOPERABLE, the reactor may remain in operation for a period not to exceed 7 days providing all active components in the other CSS loop and the RHR system (LPCI mode) and the diesel generators are OPERABLE.

3. If Specification 3.5.A.1 or Specification 3.5.A.2 cannot be met, the reactor shall be placed in the COLD SHUTDOWN CONDITION within 24 hours.

4. When the reactor vessel pressure is atmospheric and irradiated fuel is in the reactor vessel at least one core spray loop with one OPERABLE pump and associated diesel generator shall be OPERABLE, except with the reactor vessel head removed as specified in 3.5.A.5 or PRIOR TO STARTUP as specified in 3.5.A.1.

SURVEILLANCE REQUIREMENTS

4.5.A Core Spray System (CSS)

4.5.A.1.d (Cont'd)

105 psi differential pressure between the reactor vessel and the primary containment.

e. Check Valve — Once/Operating Cycle

2. When it is determined that one core spray loop is INOPERABLE, at a time when operability is required, the other core spray loop, the RHRS (LPCI mode), and the diesel generators shall be demonstrated to be OPERABLE immediately. The OPERABLE core spray loop shall be demonstrated to be OPERABLE daily thereafter.

LIMITING CONDITIONS FOR OPERATION

3.5.B Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

1. The RHRS shall be OPERABLE:

(1) PRIOR TO STARTUP from a COLD CONDITION; or

(2) when there is irradiated fuel in the reactor vessel and when the reactor vessel pressure is greater than atmospheric, except as specified in Specifications 3.5.B.2, through 3.5.B.7.

2. With the reactor vessel pressure less than 105 psig, the RHRS may be removed from service (except that two RHR pumps-containment cooling mode and associated heat exchangers must remain OPERABLE for a period not to exceed 24 hours while being drained of suppression chamber quality water and filled with primary coolant quality water provided that during cooldown two loops with one pump per loop or one loop with two pumps, and associated diesel generators in the core spray system are OPERABLE.

SURVEILLANCE REQUIREMENTS

4.5.B. Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

1. a.	Simulated Automatic Actuation Test	Once/ Operating Cycle
b.	Pump Operability	Once/ month
c.	Motor Operated valve operability	Once/ month
d.	Pump Flow Rate	Once/3 months
e.	Test Check Valve	Once/ Operating Cycle

Each LPCI pump shall deliver 9000 gpm against an indicated system pressure of 125 psig. Two LPCI pumps in the same loop shall deliver 12000 gpm against an indicated system pressure of 250 psig.

2. An air test on the drywell and torus headers and nozzles shall be conducted once/5 years. A water test may be performed on the torus header in lieu of the air test.

LIMITING CONDITIONS FOR OPERATION

3.5.B Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

8. If Specifications 3.5.B.1 through 3.5.B.7 are not met, an orderly shutdown shall be initiated and the reactor shall be placed in the COLD SHUTDOWN CONDITION within 24 hours.

9. When the reactor vessel pressure is atmospheric and irradiated fuel is in the reactor vessel at least one RHR loop with two pumps or two loops with one pump per loop shall be OPERABLE. The pumps' associated diesel generators must also be OPERABLE.

10. If the conditions of Specification 3.5.A.5 are met, LPCI and containment cooling are not required.

11. When there is irradiated fuel in the reactor and the reactor vessel pressure is greater than atmospheric, 2 RHR pumps and associated heat exchangers and valves on an adjacent unit must be OPERABLE and capable of supplying cross-connect capability except as specified in Specification 3.5.B.12 below. (Note: Because cross-connect capability is not a short-term requirement, a component is not considered INOPERABLE if cross-connect capability can be restored to service within 5 hours.)

SURVEILLANCE REQUIREMENTS

4.5.B Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

8. No additional surveillance required.

9. When the reactor vessel pressure is atmospheric, the RHR pumps and valves that are required to be OPERABLE shall be demonstrated to be OPERABLE monthly.

10. No additional surveillance required.

11. The RHR pumps on the adjacent units which supply cross-connect capability shall be demonstrated to be OPERABLE monthly when the cross-connect capability is required.

LIMITING CONDITIONS FOR OPERATION

3.5.B Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

12. If one RHR pump or associated heat exchanger located on the unit cross-connection in the adjacent unit is INOPERABLE for any reason (including valve inoperability, pipe break, etc.), the reactor may remain in operation for a period not to exceed 30 days provided the remaining RHR pump and associated diesel generator are OPERABLE.

13. If RHR cross-connection flow or heat removal capability is lost, the unit may remain in operation for a period not to exceed 10 days unless such capability is restored.

14. All recirculation pump discharge valves shall be OPERABLE PRIOR TO STARTUP (or closed if permitted elsewhere in these specifications).

SURVEILLANCE REQUIREMENTS

4.5.B Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

12. When it is determined that one RHR pump or associated heat exchanger located on the unit cross-connection in the adjacent unit is INOPERABLE at a time when operability is required, the remaining RHR pump and associated heat exchanger on the unit cross-connection and the associated diesel generator shall be demonstrated to be OPERABLE immediately and every 15 days thereafter until the INOPERABLE pump and associated heat exchanger are returned to normal service.

13. No additional surveillance required.

14. All recirculation pump discharge valves shall be tested for operability during any period of COLD SHUTDOWN CONDITION exceeding 48 hours, if operability tests have not been performed during the preceding 31 days.

LIMITING CONDITIONS FOR OPERATION

3.5.C RHR Service Water and Emergency Equipment Cooling Water Systems (EECWS)

1. PRIOR TO STARTUP from a COLD CONDITION, 9 RHRSW pumps must be OPERABLE, with 7 pumps (including pump D1 or D2) assigned to RHRSW service and 2 automatically starting pumps assigned to EECW service.

SURVEILLANCE REQUIREMENTS

4.5.C RHR Service Water and Emergency Equipment Cooling Water Systems (EECWS)

1. a. Each of the RHRSW pumps normally assigned to automatic service on the EECW headers will be tested automatically each time the diesel generators are tested. Each of the RHRSW pumps and all associated essential control valves for the EECW headers and RHR heat exchanger headers shall be demonstrated to be OPERABLE once every three months.

   b. Annually each RHRSW pump shall be flow-rate tested. To be considered OPERABLE, each pump shall pump at least 4500 gpm through its normally assigned flow path.

LIMITING CONDITIONS FOR OPERATION

3.5.C RHR Service Water and Emergency Equipment Cooling Water Systems (EECWS) (Continued)

2. During REACTOR POWER OPERATION, RHRSW pumps must be OPERABLE and assigned to service as indicated in Table 3.5-1 for the specified time limits.

3. During REACTOR POWER OPERATIONS, both RHRSW pumps D1 and D2 normally or alternately assigned to the RHR heat exchanger header supplying the standby coolant supply connection must be OPERABLE except as specified in 3.5.C.4 and 3.5.C.5 below.

SURVEILLANCE REQUIREMENTS

4.5.C RHR Service Water and Emergency Equipment Cooling Water Systems (EECWS) (Continued)

2. a. If no more than two RHRSW pumps are INOPERABLE, increased surveillance is not required.

   b. When three RHRSW pumps are INOPERABLE, the remaining pumps, associated essential control valves, and associated diesel generators shall be operated weekly.

   c. When four RHRSW pumps are INOPERABLE, the remaining pumps, associated essential control valves, and associated diesel generators shall be operated daily.

3. Routine surveillance for these pumps is specified in 4.5.C.1.

LIMITING CONDITIONS FOR OPERATION

3.5.F Reactor Core Isolation Cooling System (RCICS)

2. If the RCICS is INOPERABLE, the reactor may remain in operation for a period not to exceed 7 days if the HPCIS is OPERABLE during such time.

3. If Specifications 3.5.F.1 or 3.5.F.2 are not met, an orderly shutdown shall be initiated and the reactor shall be depressurized to less than 122 psig within 24 hours.

G. Automatic Depressurization System (ADS)

1. Four of the six valves of the Automatic Depressurization System shall be OPERABLE:

   (1) PRIOR TO STARTUP from a COLD CONDITION, or

SURVEILLANCE REQUIREMENTS

4.5.F Reactor Core Isolation Cooling System (RCICS)

4.5.F.1 (Cont'd)

d.	Flow Rate at normal reactor vessel operating pressure	Once/3 months
e.	Flow Rate at 150 psig	Once/ operating cycle

The RCIC pump shall deliver at least 600 gpm during each flow test.

2. When it is determined that the RCICS is INOPERABLE, the HPCIS shall be demonstrated to be OPERABLE immediately.

G. Automatic Depressurization System (ADS)

1. During each operating cycle the following tests shall be performed on the ADS:

   a. A simulated automatic actuation test shall be performed prior to STARTUP after each

3.6/4.6 PRIMARY SYSTEM BOUNDARY

LIMITING CONDITIONS FOR OPERATION

3.6.B. Coolant Chemistry

1. PRIOR TO STARTUP and at steaming rates less than 100,000 lb/hr, the following limits shall apply.

   a. Conductivity, µmho/cm at 25°C 2.0

   b. Chloride, ppm 0.1

2. At steaming rates greater than 100,000 lb/hr, the following limits shall apply.

   a. Conductivity, µmho/cm at 25°C 1.0

   b. Chloride, ppm 0.2

SURVEILLANCE REQUIREMENTS

4.6.B. Coolant Chemistry

1. Reactor coolant shall be continuously monitored for conductivity.

   a. Whenever the continuous conductivity monitor is inoperable and the condensate demineralizers are bypassed, a sample of reactor coolant shall be analyzed for conductivity every 4 hours. If the condensate demineralizers are in service, a sample of reactor coolant shall be analyzed for conductivity every 8 hours.

   b. Once a week the continuous monitor shall be checked with an in-line flow cell. This in-line conductivity calibration shall be performed every 24 hours whenever the reactor coolant conductivity is >1.0 µmho/cm at 25°C.

2. During startup prior to pressurizing the reactor above atmospheric pressure, measurements of reactor water quality shall be performed to show conformance with 3.6.B.1 of limiting conditions.

LIMITING CONDITIONS FOR OPERATION

3.6.B. Coolant Chemistry

3. At steaming rates greater than 100,000 lb/hr, the reactor water quality may exceed Specification 3.6.B.2 only for the time limits specified below. Exceeding these time limits of the following maximum quality limits shall be cause for placing the reactor in the COLD SHUTDOWN CONDITION.

   a. Conductivity time above 1 µmho/cm at 25°C - 2 weeks/year. Maximum Limit 10 µmho/cm at 25°C

   b. Chloride concentration time above 0.2 ppm - 2 weeks/year. Maximum Limit - 0.5 ppm.

   c. The reactor shall be placed in the SHUTDOWN CONDITION if pH <5.6 or >8.6 for a 24-hour period.

SURVEILLANCE REQUIREMENTS

4.6.B. Coolant Chemistry

3. Whenever the reactor is operating (including HOT STANDBY CONDITION) measurements of reactor water quality shall be performed according to the following schedule:

   a. Chloride ion content shall be measured at least once every 96 hours.

   b. Chloride ion content shall be measured at least every 8 hours whenever reactor conductivity is >1.0 µmho/cm at 25°C.

   c. A sample of primary coolant shall be measured for pH at least once every 8 hours whenever the reactor coolant conductivity is >1.0 µmho/cm at 25°C.

LIMITING CONDITIONS FOR OPERATION

3.6.B. Coolant Chemistry

4. When the reactor is not pressurized, except during the STARTUP CONDIION, the reactor water shall be maintained within the following limits.

    a. Conductivity - 10 μmho/cm at 25°C

    b. Chloride - 0.5 ppm

    c. pH shall be between 5.3 and 8.6.

5. When the time limits or maximum conductivity or chloride concentration limits are exceeded, an orderly shutdown shall be initiated immediately. The reactor shall be brought to the COLD SHUTDOWN CONDITION as rapidly as cooldown rate permits.

6. Whenever the reactor is critical, the limits on activity concentrations in the reactor coolant shall not exceed the equilibrium value of 3.2 μCi/gm of dose equivalent I-131.

SURVEILLANCE REQUIREMENTS

4.6.B. Coolant Chemistry

4. Whenever the reactor is not pressurized, a sample of the reactor coolant shall be analyzed at least every 96 hours for chloride ion content and pH.

5. During equilibrium power operation an isotopic analysis, including quantitative measurements for at least I-131, I-132, I-133, and I-134 shall be performed monthly on a coolant liquid sample.

6. Additional coolant samples shall be taken whenever the reactor activity exceeds one percent of the equilibrium concentration specified in 3.6.B.6 and one of the following conditions are met:

LIMITING CONDITIONS FOR OPERATION

3.6.B. Coolant Chemistry

3.6.B.6 (Cont'd)

This limit may be exceeded following power transients for a maximum of 48 hours. During this activity transient the iodine concentrations shall not exceed 26 µCi/gm whenever the reactor is critical. The reactor shall not be operated more than 5% of its yearly power operation under this exception for the equilibrium activity limits. If the iodine concentration in the coolant exceeds 26 µCi/gm, the reactor shall be shut down, and the steam line isolation valves shall be closed immediately.

SURVEILLANCE REQUIREMENTS

4.6.B. Coolant Chemistry

4.6.B.6 (Cont'd)

a. During the STARTUP CONDITION

b. Following a significant power change**

c. Following an increase in the equilibrium off-gas level exceeding 10,000 µCi/sec (at the steam jet air ejector) within a 48-hour period.

d. Whenever the equilibrium iodine limit specified in 3.6.B.6 is exceeded.

The additional coolant liquid samples shall be taken at 4 hour intervals for 48 hours, or until a stable iodine concentration below the limiting value (3.2 µCi/gm) is established. However, at least 3 consecutive samples shall be taken in all cases. An isotopic analysis shall be performed for each sample, and quantitative measurements made to determine the dose equivalent I-131 concentration. If the total iodine activity of the sample is below 0.32 uCi/gm, an isotopic analysis to determine equivalent I-131 is not required.

** For the purpose of this section on sampling frequency, a significant power exchange is defined as a change exceeding 15% of rated power in less than 1 hour.

LIMITING CONDITIONS FOR OPERATION

3.6.C Coolant Leakage

2. Both the sump and air sampling systems shall be OPERABLE during REACTOR POWER OPERATION. From and after the date that one of these systems is made or found to be INOPERABLE for any reason, REACTOR POWER OPERATION is permissible only during the succeeding 24 hours for the sump system or 72 hours for the air sampling system.

   The air sampling system may be removed from service for a period of 4 hours for calibration, function testing, and maintenance without providing a temporary monitor.

3. If the condition in 1 or 2 above cannot be met, an orderly shutdown shall be initiated and the reactor shall be placed in the COLD SHUTDOWN CONDITION within 24 hours.

3.6.D. Relief Valves

1. When more than one relief valves are known to be failed, an orderly shutdown shall be initiated and the reactor depressurized to less than 105 psig within 24 hours.

SURVEILLANCE REQUIREMENTS

4.6.C Coolant Leakage

2. With the air sampling system INOPERABLE, grab samples shall be obtained and analyzed at least once every 24 hours.

4.6.D. Relief Valves

1. Approximately one-half of all relief valves shall be bench-checked or replaced with a bench-checked valve each operating cycle. All 13 valves will have been checked or replaced upon the completion of every second cycle.

2. Once during each operating cycle, each relief valve shall be manually opened until thermocouples and acoustic monitors downstream of the valve indicate steam is flowing from the valve.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

4.6.D. Relief Valves

3. The integrity of the relief valve bellows shall be continuously monitored when valves incorporating the bellows design are installed.

4. At least one relief valve shall be disassembled and inspected each operating cycle.

3.6.E. Jet Pumps

1. Whenever the reactor is in the STARTUP or RUN modes, all jet pumps shall be operable. If it is determined that a jet pump is inoperable, or if two or more jet pump flow instrument failures occur and cannot be corrected within 12 hours, an orderly shutdown shall be initiated and the reactor shall be placed in the COLD SHUTDOWN CONDITION within 24 hours.

E. Jet Pumps

1. Whenever there is recirculation flow with the reactor in the STARTUP or RUN modes with both recirculation pumps running, jet pump operability shall be checked daily by verifying that the following conditions do not occur simultaneously:

   a. The two recirculation loops have a flow imbalance of 15% or more when the pumps are operated at the same speed.

   b. The indicated value of core flow rate varies from the value derived from loop flow measurements by more than 10%.

   c. The diffuser to lower plenum differential pressure reading on an individual jet pump varies from the mean of all jet pump differential pressures by more than 10%.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

4.6.E. Jet Pumps

2. Whenever there is recirculation flow with the reactor in the STARTUP or RUN Mode and one recirculation pump is operating with the equalizer valve closed, the diffuser to lower plenum differential pressure shall be checked daily and the differential pressure of an individual jet pump in a loop shall not vary from the mean of all jet pump differential pressures in that loop by more than 10%.

3.6.F Recirculation Pump Operation

1. The reactor shall not be operated with one recirculation loop out of service for more than 24 hours. With the reactor operating, if one recirculation loop is out of service, the plant shall be placed in a HOT SHUTDOWN CONDITION within 24 hours unless the loop is sooner returned to service.

2. Following one pump operation, the discharge valve of the low speed pump may not be opened unless the speed of the faster pump is less than 50% of its rated speed.

3. Steady-state operation with both recirculation pumps out-of-service for up to 12 hours is permitted. During such interval restart of the recirculation pumps is permitted, provided the loop discharge temperature is within 75°F of the saturation temperature of

4.6.F Recirculation Pump Operation

1. Recirculation pump speeds shall be checked and logged at least once per day.

2. No additional surveillance required.

3. Before starting either recirculation pump during steady-state operation, check and log the loop discharge temperature and dome saturation temperature.

LIMITING CONDITIONS FOR OPERATION | SURVEILLANCE REQUIREMENTS

3.7.A. Primary Containment

3.7.A.1 (Cont'd)

c. With the suppression pool water temperature > 95°F initiate pool cooling and restore the temperature to ≤ 95°F within 24 hours or be in at least the HOT SHUTDOWN CONDITION within the next 6 hours and in the COLD SHUTDOWN CONDITION within the following 30 hours.

d. With the suppression pool water temperature > 105°F during testing of ECCS or relief valves, stop all testing, initiate pool cooling and follow the action in Specification 3.7.A.1.c above.

e. With the suppression pool water temperature > 110°F during the STARTUP CONDITION, HOT STANDBY CONDITION (with all control rods not inserted), or REACTOR POWER OPERATION, the reactor shall be scrammed.

f. With the suppression pool water temperature > 120°F following reactor isolation, depressurize to < 200 psig at normal cooldown rates.

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

3. From and after the date that one train of the standby gas treatment system is made or found to be INOPERABLE for any reason, REACTOR POWER OPERATION and fuel handling is permissible only during the succeeding 7 days unless such circuit is sooner made OPERABLE, provided that during such 7 days all active components of the other two standby gas treatment trains shall be OPERABLE.

4. If these conditions cannot be met, the reactor shall be placed in a condition for which the standby gas treatment system is not required.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

4.7.B.2 (Cont'd)

d. Each train shall be operated a total of at least 10 hours every month.

e. Test sealing of gaskets for housing doors shall be performed utilizing chemical smoke generators during each test performed for compliance with Specification 4.7.B.2.a and Specification 3.7.B.2.a.

3. a. Once per operating cycle automatic initiation of each branch of the standby gas treatment system shall be demonstrated from each unit's controls.

b. At least once per year manual operability of the bypass valve for filter cooling shall be demonstrated.

c. When one train of the standby gas treatment system becomes INOPERABLE the other two trains shall be demonstrated to be OPERABLE within 2 hours and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

3.7.E. Control Room Emergency Ventilation

3. From and after the date that one of the control room emergency pressurization systems is made or found to be INOPERABLE for any reason, REACTOR POWER OPERATION or refueling operations is permissible only during the succeeding 7 days unless such circuit is sooner made OPERABLE.

4. If these conditions cannot be met, reactor shutdown shall be initiated and all reactors shall be in Cold Shutdown within 24 hours for reactor operations and refueling operations shall be terminated within 2 hours.

SURVEILLANCE REQUIREMENTS

4.7.E. Control Room Emergency Ventilation

3. At least once per operating cycle not to exceed 18 months, automatic initiation of the control room emergency pressurization system shall be demonstrated.

4. During the simulated automatic actuation test of this system (see Table 4.2.G), it shall be verified that the following dampers operate as indicated:

Close: FCO-150 B, D, E, and F
Open: FCO-151,
FCO-152

LIMITING CONDITIONS FOR OPERATION

3.7.G. Containment Atmosphere Dilution System (CAD)

1. The Containment Atmosphere Dilution (CAD) System shall be OPERABLE with:

   a. Two independent systems capable of supplying nitrogen to the drywell and torus.

   b. A minimum supply of 2,500 gallons of liquid nitrogen per system.

2. The Containment Atmosphere Dilution (CAD) System shall be OPERABLE whenever the reactor is in the RUN MODE.

3. If one system is INOPERABLE, the reactor may remain in operation for a period of 30 days provided all active components in the other system are OPERABLE.

SURVEILLANCE REQUIREMENTS

4.7.G. Containment Atmosphere Dilution System (CAD)

1. System Operability

   a. At least once per month cycle each solenoid operated air/nitrogen valve through at least one complete cycle of full travel and verify that each manual valve in the flow path is open.

   b. Verify that the CAD System contains a minimum supply of 2,500 gallons of liquid nitrogen twice per week.

2. When FCV 84-8B is INOPERABLE, each solenoid operated air/nitrogen valve of System B shall be cycled through at least one complete cycle of full travel and each manual valve in the flow path of System B shall be verified open at least once per week.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

2. The reactor shall not be started up (made critical) from the HOT STANDBY CONDITION unless all of the following conditions are satisfied:

   a. At least one offsite power source is available as specified in 3.9.A.1.c.

   b. Three units 1 and 2 diesel generators shall be OPERABLE.

   c. An additional source of power consisting of one of the following:

      (1) A second offsite power source available as specified in 3.9.A.1.c.

      (2) A fourth OPERABLE units 1 and 2 diesel generator.

   d. Requirements 3.9.A.3 through 3.9.A.6 are met.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

2. DC Power System - Unit Batteries (250-V), Diesel-Generator Batteries (125-V) and Shutdown Board Batteries (250-V)

   a. Every week the specific gravity, voltage and temperature of the pilot cell and overall battery voltage shall be measured and logged.

   b. Every three months the measurement shall be made of voltage of each cell to nearest 0.1 volt, specific gravity of each cell, and temperature of every fifth cell. These measurements shall be logged.

   c. A battery rated discharge (capacity) test shall be performed and the voltage, time, and output current measurements shall be logged at intervals not to exceed 24 months.

LIMITING CONDITIONS FOR OPERATION

3.9.B. Operation With Inoperable Equipment

3. When one of the units 1 and 2 diesel generator is INOPERABLE, continued REACTOR POWER OPERATION permissible during the succeeding 7 days, provided that 2 offsite power sources are available as specified in 3.9.A.1.c and all of the CS, RHR (LPCI and containment cooling) systems, and the remaining three units 1 and 2 diesel generators are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the COLD SHUTDOWN CONDITION within 24 hours.

4. When one units 1 and 2 4-kV shutdown board is INOPERABLE, continued REACTOR POWER OPERATION is permissible for a period of 5 days provided that 2 offsite power sources are available as specified in 3.9.A.1.c and the remaining 4-kV shutdown boards and associated diesel generators, CS, RHR (LPCI and containment cooling) systems, and all 480-V emergency power boards are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the COLD SHUTDOWN CONDITION within 24 hours.

SURVEILLANCE REQUIREMENTS

4.9.B. Operation With Inoperable Equipment

3. When one of the units 1 and 2 diesel generators is found to be INOPERABLE, all of the CS, RHR (LPCI and containment cooling) systems and the remaining diesel generators and associated boards shall be demonstrated to be OPERABLE immediately and daily thereafter.

4. When one 4-kV shutdown board is found to be INOPERABLE, all remaining 4-kV shutdown boards and associated diesel generators, CS, and RHR (LPCI and containment cooling) systems supplied by the remaining 4-kV shutdown boards shall be demonstrated to be operable immediately and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

3.9.B. Operation With Inoperable Equipment

5. When one of the shutdown buses is INOPERABLE, REACTOR POWER OPERATION is permissible for a period of 7 days.

6. When one of the 480-V diesel auxiliary boards becomes INOPERABLE, REACTOR POWER OPERATION is permissible for a period of 5 days.

7. From and after the date that one of the three 250-V unit batteries and/or its associated battery board is found to be INOPERABLE for any reason, continued REACTOR POWER OPERATION is permissible during the succeeding 7 days. Except for routine surveillance testing, NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period, and the plans to return the failed component to an OPERABLE state.

SURVEILLANCE REQUIREMENTS

4.9.B. Operation With Inoperable Equipment

5. When a shutdown bus is found to be INOPERABLE, all 1 and 2 diesel generators shall be proven OPERABLE immediately and daily thereafter.

6. When one units 1 and 2 diesel auxiliary board is found to be INOPERABLE, the remaining diesel auxiliary board and each unit 1 and 2 diesel generator shall be proven OPERABLE immediately and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B Operation With Inoperable Equipment

8. From and after the date that one of the 250-V shutdown board batteries and/or its associated battery board is found to be INOPERABLE for any reason, continued REACTOR POWER OPERATION is permissible during the succeeding five days in accordance with 3.9.B.7.

9. When one division of the logic system is INOPERABLE, continued REACTOR POWER OPERATION is permissible under this condition for seven days, provided the CSCS requirements listed in specification 3.9.B.3 are satisfied. The NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period, and the plans to return the failed component to an OPERABLE state.

10. (deleted)

11. The following limiting conditions for operation exist for the undervoltage relays which start the diesel generators on the 4-kV shutdown boards.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B. Operation With Inoperable Equipment

12. When one 480-V shutdown board is found to be INOPERABLE, the reactor will be placed in the HOT STANDBY CONDITION within 12 hours and COLD SHUTDOWN CONDITION within 24 hours.

13. If one 480-V RMOV board mg set is INOPERABLE, REACTOR POWER OPERATION may continue for a period not to exceed seven days, provided the remaining 480-V RMOV board mg sets and their associated loads remain OPERABLE.

14. If any two 480-V RMOV board mg sets become INOPERABLE, the reactor shall be placed in the COLD SHUTDOWN CONDITION within 24 hours.

15. If the requirements for operating in the conditions specified by 3.9.B.1 through 3.9.B.14 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the COLD SHUTDOWN CONDITION within 24 hours.

LIMITING CONDITIONS FOR OPERATION | SURVEILLANCE REQUIREMENTS

3.9.C. Operation in Cold Shutdown

Whenever the reactor is in COLD SHUTDOWN CONDITION with irradiated fuel in the reactor, the availability of electric power shall be as specified in Section 3.9.A except as specified herein.

1. At least two units 1 and 2 diesel generators and their associated 4-kV shutdown boards shall be OPERABLE.

2. An additional source of power energized and capable of supplying power to the units 1 and 2 shutdown boards consisting of at least one of the following:

    a. One of the offsite power sources specified in 3.9.A.1.c.

    b. A third OPERABLE diesel generator.

3. At least one 480-V shutdown board for each unit must be OPERABLE.

4. One 480-V RMOV board mg set is required for each RMOV board (1D or 1E) required to support operation of the RHR system in accordance with 3.5.B.9.

2. When a system, subsystem, train, component, or device is determined to be inoperable solely because its onsite power source is inoperable, or solely because its offsite power source is inoperable, it may be considered operable for the purpose of satisfying the requirements of its applicable Limiting Condition For Operation, provided:

(1) its corresponding offsite or diesel power source is operable; and (2) all of its redundant system(s), subsystem(s), train(s), component(s), and device(s) are operable, or likewise satisfy these requirements. Unless both conditions (1) and (2) are satisfied, the unit shall be placed in at least Hot Standby within 6 hours, and in at least Cold Shutdown within the following 30 hours. This definition is not applicable in Cold Shutdown or Refueling. This provision describes what additional conditions must be satisfied to permit operation to continue consistent with the specifications for power sources, when an offsite or onsite power source is not operable. It specifically prohibits operation when one division is inoperable because its offsite or diesel power source is inoperable and a system, subsystem, train, component, or device in another division is inoperable for another reason. This provision permits the requirements associated with individual systems, subsystems, trains, components, or devices to be consistent with the requirements of the associated electrical power source. It allows operation to be governed by the time limit of the requirements associated with the Limiting Condition For Operation for the offsite or diesel power source, not the individual requirements for each system, subsystem, train, component, or device that is determined to be inoperable solely because of the inoperability of its offsite or diesel power source.

D. PRIOR TO STARTUP - Prior to withdrawing the first control rod for the purpose of making the reactor critical.

E. Operable - Operability - A system, subsystem, train, component, or device shall be operable or have operability when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s).

F. Operating - Operating means that a system or component is performing its intended functions in its required manner.

G. Immediate - Immediate means that the required action will be initiated as soon as practicable considering the safe operation of the unit and the importance of the required action.

DEFINITIONS (Cont'd)

H. Reactor Power Operation - Reactor power operation is any operation in the STARTUP/HOT STANDBY or RUN MODE with the reactor critical and above 1 percent rated power.

I. STARTUP CONDITION - The reactor is in the STARTUP CONDITION when the withdrawal of control rods for the purpose of making the reactor critical has begun, reactor power is less than or equal to 1 percent of rated, and the reactor is in the STARTUP/HOT STANDBY MODE.

J. HOT STANDBY CONDITION - The reactor is in the HOT STANDBY CONDITION when reactor power is less than or equal to 1 percent of rated. The reactor is in the STARTUP/HOT STANDBY MODE, and the reactor is not in the STARTUP CONDITION. The reactor coolant temperature may be greater than 212° F.

Note that a HOT STANDBY CONDITION cannot exist simultaneously with a STARTUP CONDITION due to the difference in intent. A HOT STANDBY CONDITION exists when the reactor mode switch is placed in the STARTUP/HOT STANDBY position (for example, to comply with an LCO) and power level has been reduced to 1 percent or lower. Anytime control rods are being withdrawn for the purpose of increasing reactor power level, the reactor mode switch has been placed in the STARTUP/HOT STANDBY position, and reactor power level is at or below one percent, a STARTUP CONDITION exists.

K. SHUTDOWN CONDITION - The reactor is in the SHUTDOWN CONDITION when the reactor is in the Shutdown or Refuel Mode.

1. HOT SHUTDOWN CONDITION - The reactor is in the HOT SHUTDOWN CONDITION when reactor coolant temperature is greater than 212° F and the reactor is in the SHUTDOWN CONDITION.

2. COLD SHUTDOWN CONDITION - The reactor is in the COLD SHUTDOWN CONDITION when reactor coolant temperature is equal to or less than 212° F and the reactor is in the SHUTDOWN CONDITION.

L. COLD CONDITION - The reactor is in the COLD CONDITION when reactor coolant temperature is equal to or less than 212° F in any Mode of Operation (except as defined in K.2 above).

M. Mode of Operation - The reactor mode switch position determines the Mode of Operation of the reactor when there is fuel in the reactor vessel, except that the Mode of Operation may remain unchanged when the reactor mode switch is temporarily moved to another position as permitted by the notes. When there is no fuel in the reactor vessel, the reactor is considered not to be in any Mode of Operation or operational condition. The reactor mode switch may then be in any position or may be INOPERABLE.

1. Startup/Hot Standby Mode - The reactor is in the STARTUP/HOT STANDBY MODE when the reactor mode switch is in the "STARTUP/HOT STANDBY" position. This is often referred to as just the STARTUP MODE.(1)
2. Run Mode - The reactor is in the Run Mode when the reactor mode switch is in the "Run" position.
3. Shutdown Mode - The reactor is in the Shutdown Mode when the reactor mode switch is in the "Shutdown" position.(1)(2)(3)(4)
4. Refuel Mode - The reactor is in the Refuel Mode when the reactor mode switch is in the "Refuel" position.(1)

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(1) The reactor mode switch may be placed in any position to perform required tests or maintenance authorized by the shift operations supervisor, provided that the control rods are verified to remain fully inserted by a second licensed operator or other technically qualified member of the unit technical staff.

(2) The reactor mode switch may be placed in the "Refuel" position while a single control rod drive is being removed from the reactor pressure vessel per specification 3.10.A.5 provided that reactor coolant temperature is equal to or less than 212° F.

(3) The reactor mode switch may be placed in the "Refuel" position while a single control rod is being recoupled or withdrawn provided that the one-rod-out interlock is operable.

(4) The reactor mode switch may be placed in the "Startup/Hot Standby" position and withdrawal of selected control rods is permitted for the purpose of determining the operability of the RSCS and RWM prior to withdrawal of control rods for the purpose of bringing the reactor to criticality.

Q. Operating Cycle - Interval between the end of one refueling outage for a particular unit and the end of the next subsequent refueling outage for the same unit.

R. Refueling Outage - Refueling outage is the period of time between the shutdown of the unit prior to a refueling and the startup of the unit after that refueling. For the purpose of designating frequency of testing and surveillance, a refueling outage shall mean a regularly scheduled outage; however, where such outages occur within 8 months of the completion of the previous refueling outage, the required surveillance testing need not be performed until the next regularly scheduled outage.

S. CORE ALTERATION - The addition, removal, relocation, or movement of fuel, sources, incore instruments, or reactivity controls within the reactor pressure vessel with the head removed and fuel in the vessel. Normal control rod movement with the control rod drive hydraulic system is not defined as a Core Alteration. Normal movement of in-core instrumentation and the traversing in-core probe is not defined as a Core Alteration. Suspension of Core Alterations shall not preclude completion of the movement of a component to a safe conservative position.

T. Reactor Vessel Pressure - Unless otherwise indicated, reactor vessel pressures listed in the Technical Specifications are those measured by the reactor vessel steam space detectors.

U. Thermal Parameters

1. Minimum Critical Power Ratio (MCPR) - Minimum Critical Power Ratio (MCPR) is the value of the critical power ratio associated with the most limiting assembly in the reactor core. Critical Power Ratio (CPR) is the ratio of that power in a fuel assembly, which is calculated to cause some point in the assembly to experience boiling transition, to the actual assembly operating power.

2. Transition Boiling - Transition boiling means the boiling regime between nucleate and film boiling. Transition boiling is the regime in which both nucleate and film boiling occur intermittently with neither type being completely stable.

3. Core Maximum Fraction of Limiting Power Density (CMFLPD) - The highest ratio, for all fuel types in the core, of the maximum fuel rod power density (kW/ft) for a given fuel type to the limiting fuel rod power density (kW/ft) for that fuel type.

4. Average Planar Linear Heat Generation Rate (APLHGR) - The Average Planar Heat Generation Rate is applicable to a specific planar height and is equal to the sum of the linear heat generation rates for all the fuel rods in the specified bundle at the specified height divided by the number of fuel rods in the fuel bundle.

LIMITING CONDITIONS FOR OPERATION

3.1 Reactor Protection System

Applicability

Applies to the instrumentation and associated devices which initiate a reactor scram.

Objective

To assure the operability of the reactor protection system.

Specification

A. When there is fuel in the vessel, the setpoints, minimum number of trip systems, and minimum number of instrument channels that must be OPERABLE for MODE OF OPERATION shall be as given in Table 3.1.A.

B. Two RPS power monitoring channels for each inservice RPS MG sets or alternate source shall be OPERABLE.

1. With one RPS electric power monitoring channel for inservice RPS MG set or alternate power supply INOPERABLE, restore the INOPERABLE channel to OPERABLE status within 72 hours or remove the associated RPS MG set or alternate power supply from service.

SURVEILLANCE REQUIREMENTS

4.1 Reactor Protection System

Applicability

Applies to the surveillance of the instrumentation and associated devices which initiate reactor scram.

Objective

To specify the type and frequency of surveillance to be applied to the protection instrumentation.

Specification

A. Instrumentation systems shall be functionally tested and calibrated as indicated in Tables 4.1.A and 4.1.3, respectively.

B. The RPS power monitoring system instrumentation shall be determined OPERABLE:

1. At least once per 6 months by performance of channel functional tests.

NOTES FOR TABLE 3.2.F

(1) From and after the date that one of these parameters is reduced to one indication, continued operation is permissible during the succeeding 30 days unless such instrumentation is sooner made OPERABLE.

(2) From and after the date that one of these parameters is not indicated in the control room, continued operation is permissible during the succeeding seven days unless such instrumentation is sooner made OPERABLE.

(3) If the requirements of notes (1) and (2) cannot be met, and if one of the indications cannot be restored in (6) hours, an orderly shutdown shall be initiated and the reactor shall be in a COLD SHUTDOWN CONDITION within 24 hours.

(4) These surveillance instruments are considered to be redundant to each other.

(5) From and after the date that both the acoustic monitor and the temperature indication on any one valve fails to indicate in the control room, continued operation is permissible during the succeeding 30 days, unless one of the two monitoring channels is sooner made OPERABLE. If both the primary and secondary indication on any SRV tailpipe is INOPERABLE, the torus temperature will be monitored at least once per shift to observe any unexplained temperature increase which might be indicative of an open SRV.

(6) A channel consists of eight sensors, one from each alternating torus bay. Seven sensors must be OPERABLE for the channel to be OPERABLE.

(7) When one of these instruments is INOPERABLE for more than seven days, in lieu of any other report required by Specification 6.7.2, prepare and submit a Special Report to the Commission pursuant to Specification 6.7.3 within the next seven days outlining the action taken, the cause of inoperability, and the plans and schedule for restoring the system to OPERABLE status.

(8) With the plant in REACTOR POWER OPERATION, STARTUP CONDITION, HOT STANDBY CONDITION OR HOT SHUTDOWN CONDITION and with the number of OPERABLE channels less than the required OPERABLE channels, either restore the INOPERABLE channel(s) to OPERABLE status within 72 hours, or initiate the preplanned alternate method of monitoring the appropriate parameter.

3.3/4.3 REACTIVITY CONTROL

LIMITING CONDITIONS FOR OPERATION

3.3.B. Control Rods

1. Each control rod shall be coupled to its drive or completely inserted and the control rod directional control valves disarmed electrically. This requirement does not apply in the SHUTDOWN CONDITION when the reactor is vented. Two control rod drives may be removed as long as Specification 3.3.A.1 is met.

2. The control rod drive housing support system shall be in place during reactor REACTOR POWER OPERATION or when the reactor coolant system is pressurized above atmospheric with fuel in the reactor vessel, unless all control rods are fully inserted and Specification 3.3.A.1 is met.

SURVEILLANCE REQUIREMENTS

4.3.B. Control Rods

1. The coupling integrity shall be verified for each withdrawn control rod as follows:

   a. Verify that the control rod is following the drive by observing a response in the nuclear instrumentation each time a rod is moved when the reactor is operating above the preset power level of the RSCS.

   b. When the rod is fully withdrawn the first time after each refueling outage or after maintenance, observe that the drive does not go to the overtravel position.

2. The control rod drive housing support system shall be inspected after reassembly and the results of the inspection recorded.

LIMITING CONDITIONS FOR OPERATION

3.3.C. Scram Insertion Times

2. The average of the scram insertion times for the three fastest OPERABLE control rods of all groups of four control rods in a two-by-two array shall be no greater than:

% Inserted From Fully Withdrawn	Avg. Scram Insertion Times (sec)
5	0.398
20	0.954
50	2.120
90	3.800

a. The maximum scram insertion time for 90% insertion of any OPERABLE control rod shall not exceed 7.00 seconds.

D. Reactivity Anomalies

The reactivity equivalent of the difference between the actual critical rod configuration and the expected configuration during power operation shall not exceed 1% Δk. If this limit is exceeded, the reactor will be placed in SHUTDOWN CONDITION until the cause has been determined and corrective actions have been taken as appropriate.

SURVEILLANCE REQUIREMENTS

4.3.C. Scram Insertion Times

2. At 16-week intervals, 10% of the OPERABLE control rod drives shall be scram-timed above 800 psig. Whenever such scram time measurements are made, an evaluation shall be made to provide reasonable assurance that proper control rod drive performance is being maintained.

D. Reactivity Anomalies

During the STARTUP test program and STARTUP following refueling outages, the critical rod configurations will be compared to the expected configurations at selected operating conditions. These comparisons will be used as base data for reactivity monitoring during subsequent power operation throughout the fuel cycle. At specific power operating conditions, the critical rod configuration will be compared to the configuration expected based upon appropriately corrected past data. This comparison will be made at least every full power month.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.3.E. If Specifications 3.3.C and .D above cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the SHUTDOWN CONDITION within 24 hours.	4.3.E. Surveillance requirements are as specified in 4.3.C and .D above.
F. Scram Discharge Volume (SDV)	F. Scram Discharge Volume (SDV)
1. The scram discharge volume drain and vent valves shall be OPERABLE any time that the reactor protection system is required to be OPERABLE except as specified in 3.3.F.2.	1.a. The scram discharge volume drain and vent valves shall be verified open PRIOR TO STARTUP and monthly thereafter. The valves may be closed intermittently for testing not to exceed 1 hour in any 24-hour period during operation.
	1.b. The scram discharge volume drain and vent valves shall be demonstrated OPERABLE monthly.
2. In the event any SDV drain or vent valve becomes INOPERABLE, REACTOR POWER OPERATION may continue provided the redundant drain or vent valve is OPERABLE.	2. When it is determined that any SDV drain or vent valve is INOPERABLE, the redundant drain or vent valve shall be demonstrated OPERABLE immediately and weekly thereafter.
3. If redundant drain or vent valves become INOPERABLE, the reactor shall be in HOT STANDBY CONDITION within 24 hours.	3. No additional surveillance required.

LIMITING CONDITIONS FOR OPERATION

3.5 CORE AND CONTAINMENT COOLING SYSTEMS

Applicability

Applies to the operational status of the core and containment cooling systems.

Objective

To assure the operability of the core and containment cooling systems under all conditions for which this cooling capability is an essential response to plant abnormalities.

Specification

A. Core Spray System (CSS)

1. The CSS shall be OPERABLE:

(1) PRIOR TO STARTUP from a COLD CONDITION, or

(2) when there is irradiated fuel in the vessel and when the reactor vessel pressure is greater than atmospheric pressure, except as specified in Specification 3.5.A.2.

SURVEILLANCE REQUIREMENTS

4.5 CORE AND CONTAINMENT COOLING SYSTEMS

Applicability

Applies to the surveillance requirements of the core and containment cooling systems when the corresponding limiting condition for operation is in effect.

Objective

To verify the operability of the core and containment cooling systems under all conditions for which this cooling capability is an essential response to plant abnormalities.

Specification

A. Core Spray System (CSS)

1. Core Spray System Testing.

	Item	Frequency
a.	Simulated Automatic Actuation test	Once/ Operating Cycle
b.	Pump Operability	Once/ month
c.	Motor Operated Valve Operability	Once/ month
d.	System flow rate: Each loop shall deliver at least 6250 gpm against a system head corresponding to a	Once/3 months

LIMITING CONDITIONS FOR OPERATION

3.5.A Core Spray System (CSS)

2. If one CSS loop is INOPERABLE, the reactor may remain in operation for a period not to exceed 7 days providing all active components in the other CSS loop and the RHR system (LPCI mode) and the diesel generators are OPERABLE.

3. If Specification 3.5.A.1 or Specification 3.5.A.2 cannot be met, the reactor shall be placed in the COLD SHUTDOWN Condition within 24 hours.

4. When the reactor vessel pressure is atmospheric and irradiated fuel is in the reactor vessel at least one core spray loop with one OPERABLE pump and associated diesel generator shall be OPERABLE, except with the reactor vessel head removed as specified in 3.5.A.5 or PRIOR TO STARTUP as specified in 3.5.A.1.

SURVEILLANCE REQUIREMENTS

4.5.A Core Spray System (CSS)

4.5.A.1.d (Cont'd)

105 psi differential pressure between the reactor vessel and the primary containment.

e. Check Valve Once/Operating Cycle

2. When it is determined that one core spray loop is INOPERABLE, at a time when operability is required, the other core spray loop, the RHRS (LPCI mode), and the diesel generators shall be demonstrated to be OPERABLE immediately. The OPERABLE core spray loop shall be demonstrated to be OPERABLE daily thereafter.

LIMITING CONDITIONS FOR OPERATION

3.5.B Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

1. The RHRS shall be OPERABLE:

   (1) PRIOR TO STARTUP from a COLD CONDITION; or

   (2) when there is irradiated fuel in the reactor vessel and when the reactor vessel pressure is greater than atmospheric, except as specified in Specifications 3.5.B.2, through 3.5.B.7.

2. With the reactor vessel pressure less than 105 psig, the RHR may be removed from service (except that two RHR pumps-containment cooling mode and associated heat exchangers must remain OPERABLE) for a period not to exceed 24 hours while being drained of suppression chamber quality water and filled with primary coolant quality water provided that during cooldown two loops with one pump per loop or one loop with two pumps, and associated diesel generators, in the core spray system are OPERABLE.

SURVEILLANCE REQUIREMENTS

4.5.B. Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

1.	a.	Simulated Automatic Actuation Test	Once/ Operating Cycle
	b.	Pump Operability	Once/ month
	c.	Motor Operated valve operability	Once/ month
	d.	Pump Flow Rate	Once/3 months
	e.	Testable Check Valve	Once/ Operating Cycle

Each LPCI pump shall deliver 9000 gpm against an indicated system pressure of 125 psig. Two LPCI pumps in the same loop shall deliver 12,000 gpm against an indicated system pressure of 250 psig.

2. An air test on the drywell and torus headers and nozzles shall be conducted once/5 years. A water test may be performed on the torus header in lieu of the air test.

LIMITING CONDITIONS FOR OPERATION

3.5.B Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

8. If Specifications 3.5.B.1 through 3.5.B.7 are not met, an orderly shutdown shall be initiated and the reactor shall be placed in the COLD SHUTDOWN CONDITION within 24 hours.

9. When the reactor vessel pressure is atmospheric and irradiated fuel is in the reactor vessel at least one RHR loop with two pumps or two loops with one pump per loop shall be OPERABLE. The pumps' associated diesel generators must also be OPERABLE.

10. If the conditions of Specification 3.5.A.5 are met, LPCI and containment cooling are not required.

11. When there is irradiated fuel in the reactor and the reactor vessel pressure is greater than atmospheric, 2 RHR pumps and associated heat exchangers and valves on an adjacent unit must be OPERABLE and capable of supplying cross-connect capability except as specified in Specification 3.5.B.12 below. (Note: Because cross-connect capability is not a short-term requirement, a component is not considered INOPERABLE if cross-connect capability can be restored to service within 5 hours.)

SURVEILLANCE REQUIREMENTS

4.5.B. Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

8. No additional surveillance required.

9. When the reactor vessel pressure is atmospheric, the RHR pumps and valves that are required to be OPERABLE shall be demonstrated to be OPERABLE monthly.

10. No additional surveillance required.

11. The RHR pumps on the adjacent units which supply cross-connect capability shall be demonstrated to be OPERABLE monthly when the cross-connect capability is required.

LIMITING CONDITIONS FOR OPERATION

3.5.B Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

12. If three RHR pumps or associated heat exchangers located on the unit cross-connection in the adjacent units are INOPERABLE for any reason (including valve inoperability, pipe break, etc.), the reactor may remain in operation for a period not to exceed 30 days provided the remaining RHR pump and associated diesel generator are OPERABLE.

13. If RHR cross-connection flow or heat removal capability is lost, the unit may remain in operation for a period not to exceed 10 days unless such capability is restored.

14. All recirculation pump discharge valves shall be OPERABLE PRIOR TO STARTUP (or closed if permitted elsewhere in these specifications). specifications).

SURVEILLANCE REQUIREMENTS

4.5.B. Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

12. When it is determined that three RHR pumps or associated heat exchangers located on the unit cross-connection in the adjacent units are INOPERABLE at a time when operability is required, the remaining RHR pump and associated heat exchanger on the unit cross-connection and the associated diesel generator shall be demonstrated to be OPERABLE immediately and every 15 days thereafter until the INOPERABLE pump and associated heat exchanger are returned to normal service.

13. No additional surveillance required.

14. All recirculation pump discharge valves shall be tested for operability during any period of COLD SHUTDOWN CONDITION exceeding 48 hours, if operability tests have not been performed during the preceding 31 days.

LIMITING CONDITIONS FOR OPERATION

3.5.C RHR Service Water and Emergency Equipment Cooling Water Systems (EECWS)

1. PRIOR TO STARTUP from a COLD CONDITION, 9 RHRSW pumps must be OPERABLE, with 7 pumps (including one of pumps D1, D2, B2 or B1) assigned to RHRSW service and 2 automatically starting pumps assigned to EECW service.

SURVEILLANCE REQUIREMENTS

4.5.C RHR Service Water and Emergency Equipment Cooling Water Systems (EECWS)

1. a. Each of the RHRSW pumps normally assigned to automatic service on the EECW headers will be tested automatically each time the diesel generators are tested. Each of the RHRSW pumps and all associated essential control valves for the EECW headers and RHR heat exchanger headers shall be demonstrated to be OPERABLE once every three months.

   b. Annually each RHRSW pump shall be flow-rate tested. To be considered OPERABLE, each pump shall pump at least 4500 gpm through its normally assigned flow path.

LIMITING CONDITIONS FOR OPERATION

3.5.C RHR Service Water and Emergency Equipment Cooling Water Systems (EECWS) (Cont'd)

2. During REACTOR POWER OPERATION, RHRSW pumps must be OPERABLE and assigned to service as indicated in Table 3.5-1 for the specified time limits.

3. During unit 2 REACTOR POWER OPERATION, any two RHRSW pumps (D1, D2, B1, and B2) normally or alternately assigned to the RHR heat exchanger header supplying the standby coolant supply connection must be OPERABLE except as specified in 3.5.C.4 and 3.5.C.5 below.

SURVEILLANCE REQUIREMENTS

4.5.C. RHR Service Water and Emergency Equipment Cooling Water Systems (EECWS) (Cont'd)

2. a. If no more than two RHRSW pumps are INOPERABLE, increased surveillance is not required.

b. When three RHRSW pumps are INOPERABLE, the remaining pumps, associated essential control valves, and associated diesel generators shall be operated weekly.

c. When four RHRSW pumps are INOPERABLE, the remaining pumps, associated essential control valves, and associated diesel generators shall be operated daily.

3. Routine surveillance for these pumps is specified in 4.5.C.1.

LIMITING CONDITIONS FOR OPERATION

3.5.F. Reactor Core Isolation Cooling System (RCICS)

2. If the RCICS is INOPERABLE, the reactor may remain in operation for a period not to exceed 7 days if the HPCIS is OPERABLE during such time.

3. If Specifications 3.5.F.1 or 3.5.F.2 are not met, an orderly shutdown shall be initiated and the reactor shall be depressurized to less than 122 psig within 24 hours.

G. Automatic Depressurization System (ADS)

1. Four of the six valves of the Automatic Depressurization System shall be OPERABLE:

(1) PRIOR TO STARTUP from a COLD CONDITION, or

SURVEILLANCE REQUIREMENTS

4.5.F. Reactor Core Isolation Cooling System (RCICS)

4.5.F.1 (Cont'd)

d.	Flow Rate at normal reactor vessel operating pressure	Once/3 months
e.	Flow Rate at 150 psig	Once/ operating cycle

The RCIC pump shall deliver at least 600 gpm during each flow test.

2. When it is determined that the RCICS is INOPERABLE, the HPCIS shall be demonstrated to be OPERABLE immediately.

G. Automatic Depressurization System (ADS)

1. During each operating cycle the following tests shall be performed on the ADS:

a. A simulated automatic actuation test shall be performed prior to STARTUP after each

LIMITING CONDITIONS FOR OPERATION

3.6.B. Coolant Chemistry

1. PRIOR TO STARTUP and at steaming rates less than 100,000 lb/hr, the following limits shall apply.

   a. Conductivity, μmho/cm at 25°C 2.0

   b. Chloride, ppm 0.1

2. At steaming rates greater than 100,000 lb/hr, the following limits shall apply.

   a. Conductivity, μmho/cm at 25°C 1.0

   b. Chloride, ppm 0.2

SURVEILLANCE REQUIREMENTS

4.6.B. Coolant Chemistry

1. Reactor coolant shall be continuously monitored for conductivity.

   a. Whenever the continuous conductivity monitor is inoperable and the condensate demineralizers are bypassed, a sample of reactor coolant shall be analyzed for conductivity every 4 hours. If the condensate demineralizers are in service, a sample of reactor coolant shall be analyzed for conductivity every 8 hours.

   b. Once a week the continuous monitor shall be checked with an in-line flow cell. This in-line conductivity calibration shall be performed every 24 hours whenever the reactor coolant conductivity is >1.0 μmho/cm at 25°C.

2. During startup prior to pressurizing the reactor above atmospheric pressure, measurements of reactor water quality shall be performed to show conformance with 3.6.B.1 of limiting conditions.

LIMITING CONDITIONS FOR OPERATION

3.6.B. Coolant Chemistry

3. At steaming rates greater than 100,000 lb/hr, the reactor water quality may exceed Specification 3.6.B.2 only for the time limits specified below. Exceeding these time limits of the following maximum quality limits shall be cause for placing the reactor in the COLD SHUTDOWN CONDITION.

   a. Conductivity time above 1 µmho/cm at 25°C - 2 weeks/year.
      Maximum Limit 10 µmho/cm at 25°C

   b. Chloride concentration time above 0.2 ppm - 2 weeks/year.
      Maximum Limit - 0.5 ppm.

   c. The reactor shall be placed in the SHUTDOWN CONDITION if pH <5.6 or >8.6 for a 24-hour period.

SURVEILLANCE REQUIREMENTS

4.6.B. Coolant Chemistry

3. Whenever the reactor is operating (including HOT STANDBY CONDITION) measurements of reactor water quality shall be performed according to the following schedule:

   a. Chloride ion content shall be measured at least once every 96 hours.

   b. Chloride ion content shall be measured at least every 8 hours whenever reactor conductivity is >1.0 µmho/cm at 25°C.

   c. A sample of primary coolant shall be measured for pH at least once every 8 hours whenever the reactor coolant conductivity is >1.0 µmho/cm at 25°C.

LIMITING CONDITIONS FOR OPERATION

3.6.B. Coolant Chemistry

4. When the reactor is not pressurized, except during the STARTUP CONDITION, the reactor water shall be maintained within the following limits.

   a. Conductivity - 10 μmho/cm at 25°C

   b. Chloride - 0.5 ppm

   c. pH shall be between 5.3 and 8.6.

5. When the time limits or maximum conductivity or chloride concentration limits are exceeded, an orderly shutdown shall be initiated immediately. The reactor shall be brought to the COLD SHUTDOWN CONDITION as rapidly as cooldown rate permits.

6. Whenever the reactor is critical, the limits on activity concentrations in the reactor coolant shall not exceed the equilibrium value of 3.2 μc/gm of dose equivalent* I-131.

SURVEILLANCE REQUIREMENTS

4.6.B. Coolant Chemistry

4. Whenever the reactor is not pressurized, a sample of the reactor coolant shall be analyzed at least every 96 hours for chloride ion content and pH.

5. During equilibrium power operation an isotopic analysis, including quantitative measurements for at least I-131, I-132, I-133, and I-134 shall be performed monthly on a coolant liquid sample.

6. Additional coolant samples shall be taken whenever the reactor activity exceeds one percent of the equilibrium concentration specified in 3.6.B.6 and one of the following conditions are met:

LIMITING CONDITIONS FOR OPERATION

3.6.B. Coolant Chemistry

3.6.B.6 (Cont'd)

This limit may be exceeded following power transients for a maximum of 48 hours. During this activity transient the iodine concentrations shall not exceed 26 μCi/gm whenever the reactor is critical. The reactor shall not be operated more than 5% of its yearly power operation under this exception for the equilibrium activity limits. If the iodine concentration in the coolant exceeds 26 μCi/gm, the reactor shall be shut down, and the steam line isolation valves shall be closed immediately.

SURVEILLANCE REQUIREMENTS

4.6.B. Coolant Chemistry

4.6.B.6 (Cont'd)

a. During the STARTUP CONDITION

b. Following a significant power change**

c. Following an increase in the equilibrium off-gas level exceeding 10,000 μCi/sec (at the steam jet air ejector) within a 48-hour period.

d. Whenever the equilibrium iodine limit specified in 3.6.B.6 is exceeded.

The additional coolant liquid samples shall be taken at 4 hour intervals for 48 hours, or until a stable iodine concentration below the limiting value (3.2 μCi/gm) is established. However, at least 3 consecutive samples shall be taken in all cases. An isotopic analysis shall be performed for each sample, and quantitative measurements made to determine the dose equivalent I-131 concentration. If the total iodine activity of the sample is below 0.32 μCi/gm, an isotopic analysis to determine equivalent I-131 is not required.

** For the purpose of this section on sampling frequency, a significant power exchange is defined as a change exceeding 15% of rated power in less than 1 hour.

LIMITING CONDITIONS FOR OPERATION

3.6.C Coolant Leakage

2. Both the sump and air sampling systems shall be OPERABLE during REACTOR POWER OPERATION. From and after the date that one of these systems is made or found to be INOPERABLE for any reason, REACTOR POWER OPERATION is permissible only during the succeeding 24 hours for the sump system or 72 hours for the air sampling system.

   The air sampling system may be removed from service for a period of 4 hours for calibration, function testing, and maintenance without providing a temporary monitor.

3. If the condition in 1 or 2 above cannot be met, an orderly shutdown shall be initiated and the reactor shall be placed in the COLD SHUTDOWN CONDITION within 24 hours.

3.6.D. Relief Valves

1. When more than one relief valves are known to be failed, an orderly shutdown shall be initiated and the reactor depressurized to less than 105 psig within 24 hours.

SURVEILLANCE REQUIREMENTS

4.6.C Coolant Leakage

2. With the air sampling system INOPERABLE, grab samples shall be obtained and analyzed at least once every 24 hours.

4.6.D. Relief Valves

1. Approximately one-half of all relief valves shall be bench-checked or replaced with a bench-checked valve each operating cycle. All 13 valves will have been checked or replaced upon the completion of every second cycle.

2. Once during each operating cycle, each relief valve shall be manually opened until thermocouples and acoustic monitors downstream of the valve indicate steam is flowing from the valve.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

4.6.D. Relief Valves

3. The integrity of the relief valve bellows shall be continuously monitored when valves incorporating the bellows design are installed.

4. At least one relief valve shall be disassembled and inspected each operating cycle.

3.6.E. Jet Pumps

1. Whenever the reactor is in the STARTUP or RUN modes, all jet pumps shall be OPERABLE. If it is determined that a jet pump is inoperable, or if two or more jet pump flow instrument failures occur and cannot be corrected within 12 hours, an orderly shutdown shall be initiated and the reactor shall be placed in the COLD SHUTDOWNN CONDITION within 24 hours.

E. Jet Pumps

1. Whenever there is recirculation flow with the reactor in the STARTUP or RUN modes with both recirculation pumps running, jet pump operability shall be checked daily by verifying that the following conditions do not occur simultaneously:

   a. The two recirculation loops have a flow imbalance of 15% or more when the pumps are operated at the same speed.

   b. The indicated value of core flow rate varies from the value derived from loop flow measurements by more than 10%.

   c. The diffuser to lower plenum differential pressure reading on an individual jet pump varies from the mean of all jet pump differential pressures by more than 10%.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

4.6.E. Jet Pumps

2. Whenever there is recirculation flow with the reactor in the STARTUP or RUN Mode and one recirculation pump is operating with the equalizer valve closed, the diffuser to lower plenum differential pressure shall be checked daily and the differential pressure of an individual jet pump in a loop shall not vary from the mean of all jet pump differential pressures in that loop by more than 10%.

3.6.F Recirculation Pump Operation

1. The reactor shall not be operated with one recirculation loop out of service for more than 24 hours. With the reactor operating, if one recirculation loop is out of service, the plant shall be placed in a HOT SHUTDOWN CONDITION within 24 hours unless the loop is sooner returned to service.

2. Following one pump operation, the discharge valve of the low speed pump may not be opened unless the speed of the faster pump is less than 50% of its rated speed.

3. Steady-state operation with both recirculation pumps out-of-service for up to 12 hours is permitted. During such interval restart of the recirculation pumps is permitted, provided the loop discharge temperature is within 75°F of the saturation temperature of

4.6.F. Recirculation Pump Operation

1. Recirculation pump speeds shall be checked and logged at least once per day.

2. No additional surveillance required.

3. Before starting either recirculation pump during steady-state operation, check and log the loop discharge temperature and dome saturation temperature.

LIMITING CONDITIONS FOR OPERATION | SURVEILLANCE REQUIREMENTS

3.7.A. Primary Containment

3.7.A.1 (Cont'd)

c. With the suppression pool water temperature > 95°F initiate pool cooling and restore the temperature to ≤ 95°F within 24 hours or be in at least the HOT SHUTDOWN CONDITION within the next 6 hours and in the COLD SHUTDOWN CONDITION within the following 30 hours.

d. With the suppression pool water temperature > 105°F during testing of ECCS or relief valves, stop all testing, initiate pool cooling and follow the action in Specification 3.7.A.1.c above.

e. With the suppression pool water temperature > 110°F during the STARTUP CONDITION, HOT STANDBY CONDITION (with all control rods not inserted), or REACTOR POWER OPERATION, the reactor shall be scrammed.

f. With the suppression pool water temperature > 120°F following reactor isolation, depressurize to < 200 psig at normal cooldown rates.

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

3. From and after the date that one train of the standby gas treatment system is made or found to be INOPERABLE for any reason, REACTOR POWER OPERATION and fuel handling is permissible only during the succeeding 7 days unless such circuit is sooner made OPERABLE, provided that during such 7 days all active components of the other two standby gas treatment trains shall be OPERABLE.

4. If these conditions cannot be met, the reactor shall be placed in a condition for which the standby gas treatment system is not required.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

4.7.B.2 (Cont'd)

d. Each train shall be operated a total of at least 10 hours every month.

e. Test sealing of gaskets for housing doors shall be performed utilizing chemical smoke generators during each test performed for compliance with Specification 4.7.B.2.a and Specification 3.7.B.2.a.

3. a. Once per operating cycle automatic initiation of each branch of the standby gas treatment system shall be demonstrated from each unit's controls.

b. At least once per year manual operability of the bypass valve for filter cooling shall be demonstrated.

c. When one train of the standby gas treatment system becomes INOPERABLE the other two trains shall be demonstrated to be OPERABLE within 2 hours and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

3.7.E. Control Room Emergency Ventilation

3. From and after the date that one of the control room emergency pressurization systems is made or found to be INOPERABLE for any reason, REACTOR POWER OPERATION or refueling operations is permissible only during the succeeding 7 days unless such circuit is sooner made OPERABLE.

4. If these conditions cannot be met, reactor shutdown shall be initiated and all reactors shall be in Cold Shutdown within 24 hours for reactor operations and refueling operations shall be terminated within 2 hours.

SURVEILLANCE REQUIREMENTS

4.7.E. Control Room Emergency Ventilation

3. At least once per operating cycle not to exceed 18 months, automatic initiation of the control room emergency pressurization system shall be demonstrated.

4. During the simulated automatic actuation test of this system (see Table 4.2.G), it shall be verified that the following dampers operate as indicated:

   Close: FCO-150 B, D, E, and F
   Open: FCO-151
   FCO-152

LIMITING CONDITIONS FOR OPERATION

3.7.G. Containment Atmosphere Dilution System (CAD)

1. The Containment Atmosphere Dilution (CAD) System shall be OPERABLE with:

   a. Two independent systems capable of supplying nitrogen to the drywell and torus.

   b. A minimum supply of 2,500 gallons of liquid nitrogen per system.

2. The Containment Atmosphere Dilution (CAD) System shall be OPERABLE whenever the reactor is in the RUN MODE.

3. If one system is INOPERABLE, the reactor may remain in operation for a period of 30 days provided all active components in the other system are OPERABLE.

SURVEILLANCE REQUIREMENTS

4.7.G. Containment Atmosphere Dilution System (CAD)

1. System Operability

   a. At least once per month cycle each solenoid operated air/nitrogen valve through at least one complete cycle of full travel and verify that each manual valve in the flow path is open.

   b. Verify that the CAD System contains a minimum supply of 2,500 gallons of liquid nitrogen twice per week.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

2. The reactor shall not be started up (made critical) from the HOT STANDBY CONDITION unless all of the following conditions are satisfied:

   a. At least one offsite power source is available as specified in 3.9.A.1.c.

   b. Three units 1 and 2 diesel generators shall be OPERABLE.

   c. An additional source of power consisting of one of the following:

      (1) A second offsite power source available as specified in 3.9.A.1.c.

      (2) A fourth OPERABLE units 1 and 2 diesel generator.

   d. Requirements 3.9.A.3 through 3.9.A.6 are met.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

2. DC Power System - Unit Batteries (250-V), Diesel-Generator Batteries (125-V) and Shutdown Board Batteries (250-V)

   a. Every week the specific gravity, voltage and temperature of the pilot cell and overall battery voltage shall be measured and logged.

   b. Every three months the measurement shall be made of voltage of each cell to nearest 0.1 volt, specific gravity of each cell, and temperature of every fifth cell. These measurements shall be logged.

   c. A battery rated discharge (capacity) test shall be performed and the voltage, time, and output current measurements shall be logged at intervals not to exceed 24 months.

LIMITING CONDITIONS FOR OPERATION

3.9.B. Operation With Inoperable Equipment

3. When one of the units 1 and 2 diesel generator is INOPERABLE, continued REACTOR POWER OPERATION is permissible during the succeeding 7 days, provided that 2 offsite power sources are available as specified in 3.9.A.1.c and all of the CS, RHR (LPCI and containment cooling) systems, and the remaining three units 1 and 2 diesel generators are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the COLD SHUTDOWN CONDITION within 24 hours.

4. When one units 1 and 2 4-kV shutdown board is INOPERABLE, continued REACTOR POWER OPERATION is permissible for a period of 5 days provided that 2 offsite power sources are available as specified in 3.9.A.1.c and the remaining 4-kV shutdown boards and associated diesel generators, CS, RHR (LPCI and containment cooling) systems, and all 480-V emergency power boards are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the COLD SHUTDOWN CONDITION within 24 hours.

SURVEILLANCE REQUIREMENTS

4.9.B. Operation With Inoperable Equipment

3. When one of the units 1 and 2 diesel generators is found to be INOPERABLE, all of the CS, RHR (LPCI and containment cooling) systems and the remaining diesel generators and associated boards shall be demonstrated to be OPERABLE immediately and daily thereafter.

4. When one 4-kV shutdown board is found to be INOPERABLE, all remaining 4-kV shutdown boards and associated diesel generators, CS, and RHR (LPCI and containment cooling) systems supplied by the remaining 4-kV shutdown boards shall be demonstrated to be operable immediately and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

3.9.B. Operation With Inoperable Equipment

5. When one of the shutdown buses is INOPERABLE, REACTOR POWER OPERATION is permissible for a period of 7 days.

6. When one of the 480-V diesel auxiliary boards becomes INOPERABLE, REACTOR POWER OPERATION is permissible for a period of 5 days.

7. From and after the date that one of the three 250-V unit batteries and/or its associated battery board is found to be INOPERABLE for any reason, continued REACTOR POWER OPERATION is permissible during the succeeding 7 days. Except for routine surveillance testing, NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period, and the plans to return the failed component to an OPERABLE state.

SURVEILLANCE REQUIREMENTS

4.9.B. Operation With Inoperable Equipment

5. When a shutdown bus is found to be INOPERABLE, all 1 and 2 diesel generators shall be proven OPERABLE immediately and daily thereafter.

6. When one units 1 and 2 diesel auxiliary board is found to be INOPERABLE, the remaining diesel auxiliary board and each unit 1 and 2 diesel generator shall be proven OPERABLE immediately and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B Operation With Inoperable Equipment

8. From and after the date that one of the 250-V shutdown board batteries and/or its associated battery board is found to be INOPERABLE for any reason, continued REACTOR POWER OPERATION is permissible during the succeeding five days in accordance with 3.9.B.7.

9. When one division of the logic system is INOPERABLE, continued REACTOR POWER OPERATION is permissible under this condition for seven days, provided the CSCS requirements listed in Specification 3.9.B.3 are satisfied. The NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period, and the plans to return the failed component to an OPERABLE state.

10. (deleted)

11. The following limiting conditions for operation exist for the undervoltage relays which start the diesel generators on the 4-kV shutdown boards.

LIMITING CONDITIONS FOR OPERATION | SURVEILLANCE REQUIREMENTS

3.9.B. Operation With Inoperable Equipment

12. When one 480-V shutdown board is found to be INOPERABLE, the reactor will be placed in the HOT STANDBY CONDITION within 12 hours and COLD SHUTDOWN CONDITION within 24 hours.

13. If one 480-V RMOV board mg set is INOPERABLE, REACTOR POWER OPERATION may continue for a period not to exceed seven days, provided the remaining 480-V RMOV board mg sets and their associated loads remain OPERABLE.

14. If any two 480-V RMOV board mg sets become INOPERABLE, the reactor shall be placed in the COLD SHUTDOWN CONDITION within 24 hours.

15. If the requirements for operating in the conditions specified by 3.9.B.1 through 3.9.B.14 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the COLD SHUTDOWN CONDITION within 24 hours.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.C. Operation in Cold Shutdown

Whenever the reactor is in COLD SHUTDOWN CONDITION with irradiated fuel in the reactor, the availability of electric power shall be as specified in Section 3.9.A except as specified herein.

1. At least two units 1 and 2 diesel generators and their associated 4-kV shutdown boards shall be OPERABLE.

2. An additional source of power energized and capable of supplying power to the units 1 and 2 shutdown boards consisting of at least one of the following:

   a. One of the offsite power sources specified in 3.9.A.1.c.

   b. A third OPERABLE diesel generator.

3. At least one 480-V shutdown board for each unit must be OPERABLE.

4. One 480-V RMOV board mg set is required for each RMOV board (2D or 2E) required to support operation of the RHR system in accordance with 3.5.B.9.

2. When a system, subsystem, train, component, or device is determined to be inoperable solely because its onsite power source is inoperable, or solely because its offsite power source is inoperable, it may be considered operable for the purpose of satisfying the requirements of its applicable Limiting Condition For Operation, provided:

   (1) its corresponding offsite or diesel power source is operable; and (2) all of its redundant system(s), subsystem(s), train(s), component(s), and device(s) are operable, or likewise satisfy these requirements. Unless both conditions (1) and (2) are satisfied, the unit shall be placed in at least Hot Standby within 6 hours, and in at least Cold Shutdown within the following 30 hours. This definition is not applicable in Cold Shutdown or Refueling. This provision describes what additional conditions must be satisfied to permit operation to continue consistent with the specifications for power sources, when an offsite or onsite power source is not operable. It specifically prohibits operation when one division is inoperable because its offsite or diesel power source is inoperable and a system, subsystem, train, component, or device in another division is inoperable for another reason. This provision permits the requirements associated with individual systems, subsystems, trains, components, or devices to be consistent with the requirements of the associated electrical power source. It allows operation to be governed by the time limit of the requirements associated with the Limiting Condition For Operation for the offsite or diesel power source, not the individual requirements for each system, subsystem, train, component, or device that is determined to be inoperable solely because of the inoperability of its offsite or diesel power source.

D. PRIOR TO STARTUP - Prior to withdrawing the first control rod for the purpose of making the reactor critical.

E. Operable - Operability - A system, subsystem, train, component, or device shall be operable or have operability when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s).

F. Operating - Operating means that a system or component is performing its intended functions in its required manner.

G. Immediate - Immediate means that the required action will be initiated as soon as practicable considering the safe operation of the unit and the importance of the required action.

H. Reactor Power Operation - Reactor power operation is any operation in the STARTUP/HOT STANDBY or RUN MODE with the reactor critical and above 1 percent rated power.

I. STARTUP CONDITION - The reactor is in the STARTUP CONDITION when the withdrawal of control rods for the purpose of making the reactor critical has begun, reactor power is less than or equal to 1 percent of rated, and the reactor is in the STARTUP/HOT STANDBY MODE.

J. HOT STANDBY CONDITION - The reactor is in the HOT STANDBY CONDITION when reactor power is less than or equal to 1 percent of rated. The reactor is in the STARTUP/HOT STANDBY MODE, and the reactor is not in the STARTUP CONDITION. The reactor coolant temperature may be greater than 212° F

Note that a HOT STANDBY CONDITION cannot exist simultaneously with a STARTUP CONDITION due to the difference in intent. A HOT STANDBY CONDITION exists when the reactor mode switch is placed in the STARTUP/HOT STANDBY position (for example, to comply with an LCO) and power level has been reduced to 1 percent or lower. Anytime control rods are being withdrawn for the purpose of increasing reactor power level, the reactor mode switch has been placed in the STARTUP/HOT STANDBY position, and reactor power level is at or below one percent, a STARTUP CONDITION exists.

K. SHUTDOWN CONDITION - The reactor is in the SHUTDOWN CONDITION when the reactor is in the Shutdown or Refuel Mode.

1. HOT SHUTDOWN CONDITION - The reactor is in the HOT SHUTDOWN CONDITION when reactor coolant temperature is greater than 212° F and the reactor is in the SHUTDOWN CONDITION.

2. COLD SHUTDOWN CONDITION - The reactor is in the COLD SHUTDOWN CONDITION when reactor coolant temperature is equal to or less than 212° F and the reactor is in the SHUTDOWN CONDITION.

L. COLD CONDITION - The reactor is in the COLD CONDITION when reactor coolant temperature is equal to or less than 212° F in any Mode of Operation (except as defined in K.2 above).

7M. Mode of Operation - The reactor mode switch position determines the Mode of Operation of the reactor when there is fuel in the reactor vessel, except that the Mode of Operation may remain unchanged when the reactor mode switch is temporarily moved to another position as permitted by the notes. When there is no fuel in the reactor vessel, the reactor is considered not to be in any Mode of Operation or operational condition. The reactor mode switch may then be in any position or may be INOPERABLE.

1. Startup/Hot Standby Mode - The reactor is in the STARTUP/HOT STANDBY MODE when the reactor mode switch is in the "STARTUP/HOT STANDBY" position. This is often referred to as just the STARTUP MODE.(1)

2. Run Mode - The reactor is in the Run Mode when the reactor mode switch is in the "Run" position.

3. Shutdown Mode - The reactor is in the Shutdown Mode when the reactor mode switch is in the "Shutdown" position.(1)(2)(3)(4)

4. Refuel Mode - The reactor is in the Refuel Mode when the reactor mode switch is in the "Refuel" position.(1)

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(1) The reactor mode switch may be placed in any position to perform required tests or maintenance authorized by the shift operations supervisor, provided that the control rods are verified to remain fully inserted by a second licensed operator or other technically qualified member of the unit technical staff.

(2) The reactor mode switch may be placed in the "Refuel" position while a single control rod drive is being removed from the reactor pressure vessel per specification 3.10.A.5 provided that reactor coolant temperature is equal to or less than 212° F.

(3) The reactor mode switch may be placed in the "Refuel" position while a single control rod is being recoupled or withdrawn provided that the one-rod-out interlock is operable.

(4) The reactor mode switch may be placed in the "Startup/Hot Standby" position and withdrawal of selected control rods is permitted for the purpose of determining the operability of the RSCS and RWM prior to withdrawal of control rods for the purpose of bringing the reactor to criticality.

Q. Operating Cycle - Interval between the end of one refueling outage for a particular unit and the end of the next subsequent refueling outage for the same unit.

R. Refueling Outage - Refueling outage is the period of time between the shutdown of the unit prior to a refueling and the startup of the unit after that refueling. For the purpose of designating frequency of testing and surveillance, a refueling outage shall mean a regularly scheduled outage; however, where such outages occur within 8 months of the completion of the previous refueling outage, the required surveillance testing need not be performed until the next regularly scheduled outage.

S. CORE ALTERATION - The addition, removal, relocation, or movement of fuel, sources, incore instruments, or reactivity controls within the reactor pressure vessel with the head removed and fuel in the vessel. Normal control rod movement with the control rod drive hydraulic system is not defined as a Core Alteration. Normal movement of in-core instrumentation and the traversing in-core probe is not defined as a Core Alteration. Suspension of Core Alterations shall not preclude completion of the movement of a component to a safe conservative position.

T. Reactor Vessel Pressure - Unless otherwise indicated, reactor vessel pressures listed in the Technical Specifications are those measured by the reactor vessel steam space detectors.

U. Thermal Parameters

1. Minimum Critical Power Ratio (MCPR) - Minimum Critical Power Ratio (MCPR) is the value of the critical power ratio associated with the most limiting assembly in the reactor core. Critical Power Ratio (CPR) is the ratio of that power in a fuel assembly, which is calculated to cause some point in the assembly to experience boiling transition, to the actual assembly operating power.

2. Transition Boiling - Transition boiling means the boiling regime between nucleate and film boiling. Transition boiling is the regime in which both nucleate and film boiling occur intermittently with neither type being completely stable.

3. Core Maximum Fraction of Limiting Power Density (CMFLPD) - The highest ratio, for all fuel types in the core, of the maximum fuel rod power density (kW/ft) for a given fuel type to the limiting fuel rod power density (kW/ft) for that fuel type.

4. Average Planar Linear Heat Generation Rate (APLHGR) - The Average Planar Heat Generation Rate is applicable to a specific planar height and is equal to the sum of the linear heat generation rates for all the fuel rods in the specified bundle at the specified height divided by the number of fuel rods in the fuel bundle.

3.1/4.1 REACTOR PROTECTION SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.1 Reactor Protection System

Applicability

Applies to the instrumentation and associated devices which initiate a reactor scram.

Objective

To assure the operability of the reactor protection system.

Specification

A. When there is fuel in the vessel, the setpoints, minimum number of trip systems, and minimum number of instrument channels that must be OPERABLE for each MODE OF OPERATION shall be as given in Table 3.1.A

SURVEILLANCE REQUIREMENTS

4.1 Reactor Protection System

Applicability

Applies to the surveillance of the instrumentation and associated devices which initiate reactor scram.

Objective

To specify the type and frequency of surveillance to be applied to the protection instrumentation.

Specification

A. Instrumentation systems shall be functionally tested and calibrated as indicated in Tables 4.1.A and 4.1.B, respectively.

NOTES FOR TABLE 3.2.F

(1) From and after the date that one of these parameters is reduced to one indication, continued operation is permissible during the succeeding 30 days unless such instrumentation is sooner made operable.

(2) From and after the date that one of these parameters is not indicated in the control room, continued operation is permissible during the succeeding seven days unless such instrumentation is sooner made operable.

(3) If the requirements of notes (1) and (2) cannot be met, and if one of the indications cannot be restored in (6) hours, an orderly shutdown shall be initiated and the reactor shall be in a COLD SHUTDOWN CONDITION within 24 hours.

(4) These surveillance instruments are considered to be redundant to each other.

(5) From and after the date that both the acoustic monitor and the temperature indication on any one valve fails to indicate in the control room, continued operation is permissible during the succeeding 30 days, unless one of the two monitoring channels is sooner made available. If both the primary and secondary indication on any SRV tailpipe is inoperable, the torus temperature will be monitored at least once per shift to observe any unexplained temperature increase which might be indicative of an open SRV.

(6) A channel consists of eight sensors, one from each alternating torus bay. Seven sensors must be operable for the channel to be operable.

3.3/4.3 REACTIVITY CONTROL

LIMITING CONDITIONS FOR OPERATION

3.3.B. Control Rods

1. Each control rod shall be coupled to its drive or completely inserted and the control rod directional control valves disarmed electrically. This requirement does not apply in the SHUTDOWN CONDITION when the reactor is vented. Two control rod drives may be removed as long as Specification 3.3.A.1 is met.

2. The control rod drive housing support system shall be in place during REACTOR POWER OPERATION or when the reactor coolant system is pressurized above atmospheric pressure with fuel in the reactor vessel, unless all control rods are fully inserted and Specification 3.3.A.1 is met.

SURVEILLANCE REQUIREMENTS

4.3.B. Control Rods

1. The coupling integrity shall be verified for each withdrawn control rod as follows:

   a. Verify that the control rod is following the drive by observing a response in the nuclear instrumentation each time a rod is moved when the reactor is operating above the preset power level of the RSCS.

   b. When the rod is fully withdrawn the first time after each refueling outage or after maintenance, observe that the drive does not go to the overtravel position.

2. The control rod drive housing support system shall be inspected after reassembly and the results of the inspection recorded.

LIMITING CONDITIONS FOR OPERATION

3.3.C. Scram Insertion Times

2. The average of the scram insertion times for the three fastest OPERABLE control rods of all groups of four control rods in a two-by-two array shall be no greater than:

% Inserted From Fully Withdrawn	Avg. Scram Insertion Times (sec)
5	0.398
20	0.954
50	2.120
90	3.800

3. The maximum scram insertion time for 90% insertion of any OPERABLE control rod shall not exceed 7.00 seconds.

D. Reactivity Anomalies

The reactivity equivalent of the difference between the actual critical rod configuration and the expected configuration during power operation shall not exceed 1% Δk. If this limit is exceeded, the reactor will be placed in the SHUTDOWN CONDITION until the cause has been determined and corrective actions have been taken as appropriate.

SURVEILLANCE REQUIREMENTS

4.3.C. Scram Insertion Times

2. At 16-week intervals, 10% of the OPERABLE control rod drives shall be scram-timed above 800 psig. Whenever such scram time measurements are made, an evaluation shall be made to provide reasonable assurance that proper control rod drive performance is being maintained.

D. Reactivity Anomalies

During the startup test program and startup following refueling outages, the critical rod configurations will be compared to the expected configurations at selected operating conditions. These comparisons will be used as base data for reactivity monitoring during subsequent power operation throughout the fuel cycle. At specific power operating conditions, the critical rod configuration will be compared to the configuration expected based upon appropriately corrected past data. This comparison will be made at least every full power month.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.3.E. If Specifications 3.3.C and .D above cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the SHUTDOWN CONDITION within 24 hours.	4.3.E. Surveillance requirements are as specified in 4.3.C and .D above.
F. Scram Discharge Volume (SDV)	F. Scram Discharge Volume (SDV)
1. The scram discharge volume drain and vent valves shall be OPERABLE any time that the reactor protection system is required to be OPERABLE except as specified in 3.3.F.2.	1.a. The scram discharge volume drain and vent valves shall be verified open PRIOR TO STARTUP and monthly thereafter. The valves may be closed intermittently for testing not to exceed 1 hour in any 24-hour period during operation.
	1.b. The scram discharge volume drain and vent valves shall be demonstrated OPERABLE monthly.
2. In the event any SDV drain or vent valve becomes INOPERABLE, REACTOR POWER OPERATION may continue provided the redundant drain or vent valve is OPERABLE.	2. When it is determined that any SDV drain or vent valve is INOPERABLE, the redundant drain or vent valve shall be demonstrated OPERABLE immediately and weekly thereafter.
3. If redundant drain or vent valves become INOPERABLE, the reactor shall be in HOT STANDBY CONDITION within 24 hours.	3. No additional surveillance required.

LIMITING CONDITIONS FOR OPERATION

3.5 CORE AND CONTAINMENT COOLING SYSTEMS

Applicability

Applies to the operational status of the Core and Containment Cooling Systems.

Objective

To assure the operability of the Core and Containment Cooling Systems under all conditions for which this cooling capability is an essential response to plant abnormalities.

Specification

A. Core Spray System (CSS)

1. The CSS shall be OPERABLE:

   (1) PRIOR TO STARTUP from a COLD CONDITION, or

   (2) when there is irradiated fuel in the vessel and when the reactor vessel pressure is greater than atmospheric pressure, except as specified in Specification 3.5.A.2.

SURVEILLANCE REQUIREMENTS

4.5 CORE AND CONTAINMENT COOLING SYSTEMS

Applicability

Applies to the surveillance requirements of the Core and Containment Cooling Systems when the corresponding limiting condition for operation is in effect.

Objective

To verify the operability of the Core and Containment Cooling Systems under all conditions for which this cooling capability is an essential response to plant abnormalities.

Specification

A. Core Spray System (CSS)

1. Core Spray System Testing.

	Item	Frequency
a.	Simulated Automatic Actuation test	Once/ Operating Cycle
b.	Pump Operability	Once/ month
c.	Motor Operated Valve Operability	Once/ month
d.	System flow rate: Each loop shall deliver at least 6250 gpm against a system head corresponding to a	Once/3 months

LIMITING CONDITIONS FOR OPERATION

3.5.A Core Spray System (CSS)

2. If one CSS loop is INOPERABLE, the reactor may remain in operation for a period not to exceed 7 days providing all active components in the other CSS loop and the RHR system (LPCI mode) and the diesel generators are OPERABLE.

3. If Specification 3.5.A.1 or Specification 3.5.A.2 cannot be met, the reactor shall be placed in the COLD SHUTDOWN CONDITION within 24 hours.

4. When the reactor vessel pressure is atmospheric and irradiated fuel is in the reactor vessel at least one core spray loop with one OPERABLE pump and associated diesel generator shall be OPERABLE, except with the reactor vessel head removed as specified in 3.5.A.5 or PRIOR TO STARTUP as specified in 3.5.A.1.

SURVEILLANCE REQUIREMENTS

4.5 A Core Spray System (CSS)

4.5.A.1.d (Cont'd)

105 psi differential pressure between the reactor vessel and the primary containment.

e. Testable Check Valve — Once/Operating Cycle

2. When it is determined that one core spray loop is INOPERABLE, at a time when operability is required, the other core spray loop, the RHRS (LPCI mode), and the diesel generators shall be demonstrated to be OPERABLE immediately. The OPERABLE core spray loop shall be demonstrated to be OPERABLE daily thereafter.

LIMITING CONDITIONS FOR OPERATION

3.5.B Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

1. The RHRS shall be OPERABLE:

   (1) PRIOR TO STARTUP from a COLD CONDITION; or

   (2) when there is irradiated fuel in the reactor vessel and when the reactor vessel pressure is greater than atmospheric, except as specified in Specifications 3.5.B.2, through 3.5.B.7.

2. With the reactor vessel pressure less than 105 psig, the RHR may be removed from service (except that two RHR pumps-containment cooling mode and associated heat exchangers must remain OPERABLE) for a period not to exceed 24 hours while being drained of suppression chamber quality water and filled with primary coolant quality water provided that during cooldown two loops with one pump per loop or one loop with two pumps, and associated diesel generators, in the core spray system are OPERABLE.

SURVEILLANCE REQUIREMENTS

4.5.B. Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)

1.	a.	Simulated Automatic Actuation Test	Once/ Operating Cycle
	b.	Pump Operability	Once/ month
	c.	Motor Operated valve operability	Once/ month
	d.	Pump Flow Rate	Once/3 months
	e.	Testable Check Valve	Once/ Operating Cycle

Each LPCI pump shall deliver 9000 gpm against an indicated system pressure of 125 psig. Two LPCI pumps in the same loop shall deliver 12000 gpm against an indicated system pressure of 250 psig.

2. An air test on the drywell and torus headers and nozzles shall be conducted once/5 years. A water test may be performed on the torus header in lieu of the air test.

LIMITING CONDITIONS FOR OPERATION

3.5.B Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)(Cont'd)

8. If Specifications 3.5.B.1 through 3.5.B.7 are not met, an orderly shutdown shall be initiated and the reactor shall be placed in the COLD SHUTDOWN CONDITION within 24 hours.

9. When the reactor vessel pressure is atmospheric and irradiated fuel is in the reactor vessel at least one RHR loop with two pumps or two loops with one pump per loop shall be OPERABLE. The pumps' associated diesel generators must also be OPERABLE.

10. If the conditions of Specification 3.5.A.5 are met, LPCI and containment cooling are not required.

11. When there is irradiated fuel in the reactor and the reactor vessel pressure is greater than atmospheric, unit 2 RHR pumps B and D associated with heat exchangers and valves must be OPERABLE and capable of supplying cross-connect capability except as specified in Specification 3.5.B.12 below. (Note: Because cross-connect capability is not a short-term requirement, a component is not considered INOPERABLE if cross-connect capability can be restored to service within 5 hours.)

SURVEILLANCE REQUIREMENTS

4.5.B Residual Heat Removal System (RHRS) (LPCI and Containment Cooling)(Cont'd)

8. No additional surveillance required.

9. When the reactor vessel pressure is atmospheric, the RHR pumps and valves that are required to be OPERABLE shall be demonstrated to be OPERABLE monthly.

10. No additional surveillance required.

11. The B and D RHR pumps on unit 2 which supply cross-connect capability shall be OPERABLE monthly when the cross-connect capability is required.

LIMITING CONDITIONS FOR OPERATION

3.5.B <u>Residual Heat Removal System (RHRS)</u> (LPCI and Containment Cooling)(Cont'd)

12. If one RHR pump or associated heat exchanger located on the unit cross-connection in unit 2 is INOPERABLE for any reason (including valve inoperability, pipe break, etc.), the reactor may remain in operation for a period not to exceed 30 days provided the remaining RHR pump and associated diesel generator are OPERABLE.

13. If RHR cross-connection flow or heat removal capability is lost, the unit may remain in operation for a period not to exceed 10 days unless such capability is restored.

14. All recirculation pump discharge valves shall be OPERABLE PRIOR TO STARTUP (or closed if permitted elsewhere in these specifications). specifications).

SURVEILLANCE REQUIREMENTS

4.5.B <u>Residual Heat Removal System (RHRS)</u> (LPCI and Containment Cooling)(Cont'd)

12. When it is determined that one RHR pump or associated heat exchanger located on the unit cross-connection in the adjacent unit is INOPERABLE at a time when operability is required, the remaining RHR pump and associated heat exchanger on the unit cross-connection and the associated diesel generator shall be demonstrated to be OPERABLE immediately and every 15 days thereafter until the INOPERABLE pump and associated heat exchanger are returned to normal service.

13. No additional surveillance required.

14. All recirculation pump discharge valves shall be tested for operability during any period of COLD SHUTDOWN CONDITION exceeding 48 hours, if operability tests have not been performed during the preceding 31 days.

LIMITING CONDITIONS FOR OPERATION

3.5.C RHR Service Water and Emergency Equipment Cooling Water Systems (EECWS)

1. PRIOR TO STARTUP from a COLD CONDITION, 9 RHRSW pumps must be OPERABLE, with 7 pumps (including pump B1 or B2) assigned to RHRSW service and 2 automatically starting pumps assigned to EECW service.

SURVEILLANCE REQUIREMENTS

4.5.C RHR Service Water and Emergency Equipment Cooling Water Systems (EECWS)

1. a. Each of the RHRSW pumps normally assigned to automatic service on the EECW headers will be tested automatically each time the diesel generators are tested. Each of the RHRSW pumps and all associated essential control valves for the EECW headers and RHR heat exchanger headers shall be demonstrated to be OPERABLE once every three months.

   b. Annually each RHRSW pump shall be flow-rate tested. To be considered OPERABLE, each pump shall pump at least 4500 gpm through its normally assigned flow path.

LIMITING CONDITIONS FOR OPERATION

3.5.C RHR Service Water and Emergency Equipment Cooling Water Systems (EECWS) (Cont'd)

2. During REACTOR POWER OPERATION, RHRSW pumps must be OPERABLE and assigned to service as indicated in Table 3.5-1 for the specified time limits.

3. During REACTOR POWER OPERATION, both RHRSW pumps B1 and B2 normally or alternately assigned to the RHR heat exchanger header supplying the standby coolant supply connection must be OPERABLE; except as specified in 3.5.C.4 and 3.5.C.5 below.

SURVEILLANCE REQUIREMENTS

4.5.C RHR Service Water and Emergency Equipment Cooling Water Systems (EECWS) (Cont'd)

2. a. If no more than two RHRSW pumps are INOPERABLE, increased surveillance is not required.

   b. When three RHRSW pumps are INOPERABLE, the remaining pumps, associated essential control valves, and associated diesel generators shall be operated weekly.

   c. When four RHRSW pumps are INOPERABLE, the remaining pumps, associated essential control valves, and associated diesel generators shall be operated daily.

3. Routine surveillance for these pumps is specified in 4.5.C.1.

LIMITING CONDITIONS FOR OPERATION

3.5.F Reactor Core Isolation Cooling System (RCICS)

2. If the RCICS is INOPERABLE, the reactor may remain in operation for a period not to exceed 7 days if the HPCIS is OPERABLE during such time.

3. If Specifications 3.5.F.1 or 3.5.F.2 are not met, an orderly shutdown shall be initiated and the reactor shall be depressurized to less than 105 psig within 24 hours.

G. Automatic Depressurization System (ADS)

1. Four of the six valves of the Automatic Depressurization System shall be OPERABLE:

(1) PRIOR TO STARTUP from a COLD CONDITION, or

SURVEILLANCE REQUIREMENTS

4.5.F Reactor Core Isolation Cooling System (RCICS)

4.5.F.1 (Cont'd)

d.	Flow Rate at normal reactor vessel operating pressure	Once/3 months
e.	Flow Rate at 150 psig	Once/ operating cycle

The RCIC pump shall deliver at least 600 gpm during each flow test.

2. When it is determined that the RCICS is INOPERABLE, the HPCIS shall be demonstrated to be OPERABLE immediately and weekly thereafter.

G. Automatic Depressurization System (ADS)

1. During each operating cycle the following tests shall be performed on the ADS:

a. A simulated automatic actuation test shall be performed prior to STARTUP after each

LIMITING CONDITIONS FOR OPERATION

3.6.B. Coolant Chemistry

1. PRIOR TO STARTUP and at steaming rates less than 100,000 lb/hr, the following limits shall apply.

   a. Conductivity, µmho/cm at 25°C 2.0

   b. Chloride, ppm 0.1

2. At steaming rates greater than 100,000 lb/hr, the following limits shall apply.

   a. Conductivity, µmho/cm at 25°C 2.0

   b. Chloride, ppm 0.2

SURVEILLANCE REQUIREMENTS

4.6.B. Coolant Chemistry

1. A sample of reactor coolant shall be analyzed:

   a. At least every 96 hours for conductivity and cloride ion content.

   b. At least every 24 hours during STARTUPs, until the steaming rate is greater than 100,000 lb/hr, for conductivity and chloride ion content.

   c. At least every 8 hours for conductivity and chloride ion content when the continuous conductivity monitor is INOPERABLE.

2. During equilibrium power operation an isotopic analysis, including quantitative measurements for at least I-131, I-132, I-133, and I-134 shall be performed monthly on a coolant liquid sample.

LIMITING CONDITIONS FOR OPERATION

3.6.B. Coolant Chemistry

3. At steaming rates greater than 100,000 lb/hr, the reactor water quality may exceed Specification 3.6.B.2 only for the time limits specified below. Exceeding these time limits of the following maximum quality limits shall be cause for placing the reactor in the COLD SHUTDOWN CONDITION.

   a. Conductivity
      time above
      2 μmho/cm at 25°C - 4 weeks/year.
      Maximum Limit
      10 μmho/cm at 25°C

   b. Chloride
      concentration time above 0.2 ppm - 4 weeks/year.
      Maximum Limit - 0.5 ppm.

SURVEILLANCE REQUIREMENTS

4.6.B. Coolant Chemistry

3. Additional coolant samples shall be taken whenever the reactor activity exceeds one percent of the equilibrium concentration specified in 3.6.B.5 and one of the following conditions are met.

   a. During the STARTUP CONDITION

   b. Following a significant power change**.

   c. Following an increase in the equilibrium off-gas level exceeding 10,000 μuci/sec (at the steam jet air ejector) within a 48-hour period.

   d. Whenever the equilibrium iodine limit specified in 3.6.B.5 is exceeded.

**For the purpose of this section on sampling frequency, a significant power exchange is defined as a change exceeding 15% of rated power in less than 1 hour.

LIMITING CONDITIONS FOR OPERATION

3.6.B. Coolant Chemistry

4. When the reactor is not pressurized, except during the STARTUP CONDITION, the reactor water shall be maintained within the following limits.

   a. Conductivity - 10 μmho/cm at 25°C

   b. Chloride - 0.5 ppm

SURVEILLANCE REQUIREMENTS

4.6.B. Coolant Chemistry

The additional coolant liquid samples shall be taken at 4-hour intervals for 48 hours, or until a stable iodine concentration below the limiting value (3.2 μci/gm) is established. However, at least 3 consecutive samples shall be taken in all cases. An isotopic analysis shall be performed for each sample, and quantitative measurements made to determine the dose equivalent I-131 concentration. If the total iodine activity of the sample is below 0.032 μci/gm, an isotopic analysis to determine equivalent I-131 is not required.

LIMITING CONDITIONS FOR OPERATION

3.6.C Coolant Leakage

2. Both the sump and air sampling systems shall be OPERABLE during REACTOR POWER OPERATION. From and after the date that one of these systems is made or found to be INOPERABLE for any reason, REACTOR POWER OPERATION is permissible only during the succeeding 24 hours for the sump system or 72 hours for the air sampling system.

   The air sampling system may be removed from service for a period of 4 hours for calibration, function testing, and maintenance without providing a temporary monitor.

3. If the condition in 1 or 2 above cannot be met, an orderly shutdown shall be initiated and the reactor shall be placed in the COLD SHUTDOWN CONDITION within 24 hours.

3.6.D. Relief Valves

1. When more than one relief valves are known to be failed, an orderly shutdown shall be initiated and the reactor depressurized to less than 105 psig within 24 hours.

SURVEILLANCE REQUIREMENTS

4.6.C Coolant Leakage

2. With the air sampling system INOPERABLE, grab samples shall be obtained and analyzed at least once every 24 hours.

4.6.D. Relief Valves

1. Approximately one-half of all relief valves shall be bench-checked or replaced with a bench-checked valve each operating cycle. All 13 valves will have been checked or replaced upon the completion of every second cycle.

2. Once during each operating cycle, each relief valve shall be manually opened until thermocouples and acoustic monitors downstream of the valve indicate steam is flowing from the valve.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

4.6.D. Relief Valves

3. The integrity of the relief valve bellows shall be continuously monitored when valves incorporating the bellows design are installed.

4. At least one relief valve shall be disassembled and inspected each operating cycle.

3.6.E. Jet Pumps

1. Whenever the reactor is in the STARTUP or RUN modes, all jet pumps shall be OPERABLE. If it is determined that a jet pump is inoperable, or if two or more jet pump flow instrument failures occur and cannot be corrected within 12 hours, an orderly shutdown shall be initiated and the reactor shall be placed in the COLD SHUTDOWNN CONDITION within 24 hours.

E. Jet Pumps

1. Whenever there is recirculation flow with the reactor in the STARTUP or RUN modes with both recirculation pumps running, jet pump operability shall be checked daily by verifying that the following conditions do not occur simultaneously:

   a. The two recirculation loops have a flow imbalance of 15% or more when the pumps are operated at the same speed.

   b. The indicated value of core flow rate varies from the value derived from loop flow measurements by more than 10%.

   c. The diffuser to lower plenum differential pressure reading on an individual jet pump varies from the mean of all jet pump differential pressures by more than 10%.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

4.6.E. Jet Pumps

2. Whenever there is recirculation flow with the reactor in the STARTUP or RUN Mode and one recirculation pump is operating with the equalizer valve closed, the diffuser to lower plenum differential pressure shall be checked daily and the differential pressure of an individual jet pump in a loop shall not vary from the mean of all jet pump differential pressures in that loop by more than 10%.

3.6.F Recirculation Pump Operation

1. The reactor shall not be operated with one recirculation loop out of service for more than 24 hours. With the reactor operating, if one recirculation loop is out of service, the plant shall be placed in a HOT SHUTDOWN CONDITION within 24 hours unless the loop is sooner returned to service.

2. Following one-pump operation, the discharge valve of the low speed pump may not be opened unless the speed of the faster pump is less than 50% of its rated speed.

3. Steady-state operation with both recirculation pumps out-of-service for up to 12 hours is permitted. During such interval restart of the recirculation pumps is permitted, provided the loop discharge temperature is within 75°F of the saturation temperature of

4.6.F Recirculation Pump Operation

1. Recirculation pump speeds shall be checked and logged at least once per day.

2. No additional surveillance required.

3. Before starting either pump during steady-state operation, check and log the loop discharge temperature and dome saturation temperature.

LIMITING CONDITIONS FOR OPERATION — SURVEILLANCE REQUIREMENTS

3.7.A. Primary Containment

3.7.A (Cont'd)

c. With the suppression pool water temperature > 95°F initiate pool cooling and restore the temperature to ≤ 95°F within 24 hours or be in at least the HOT SHUTDOWN CONDITION within the next 6 hours and in the COLD SHUTDOWN CONDITION within the following 30 hours.

d. With the suppression pool water temperature > 105°F during testing of ECCS or relief valves, stop all testing, initiate pool cooling and follow the action in Specification 3.7.A.1.c above.

e. With the suppression pool water temperature > 110°F during the STARTUP CONDITION, HOT STANDBY CONDITION (with all control rods not inserted), or REACTOR POWER OPERATION, the reactor shall be scrammed.

f. With the suppression pool water temperature > 120°F following reactor isolation, depressurize to < 200 psig at normal cooldown rates.

LIMITING CONDITIONS FOR OPERATION

3.7.B. Standby Gas Treatment System

3. From and after the date that one train of the standby gas treatment system is made or found to be INOPERABLE for any reason, REACTOR POWER OPERATION and fuel handling is permissible only during the succeeding 7 days unless such circuit is sooner made OPERABLE, provided that during such 7 days all active components of the other two standby gas treatment trains shall be OPERABLE.

4. If these conditions cannot be met, the reactor shall be placed in a condition for which the standby gas treatment system is not required.

SURVEILLANCE REQUIREMENTS

4.7.B. Standby Gas Treatment System

4.7.B.2 (Cont'd)

d. Each train shall be operated a total of at least 10 hours every month.

e. Test sealing of gaskets for housing doors shall be performed utilizing chemical smoke generators during each test performed for compliance with Specification 4.7.B.2.a and Specification 3.7.B.2.a.

3. a. Once per operating cycle automatic initiation of each branch of the standby gas treatment system shall be demonstrated from each unit's controls.

b. At least once per year manual operability of the bypass valve for filter cooling shall be demonstrated.

c. When one train of the standby gas treatment system becomes INOPERABLE the other two trains shall be demonstrated to be OPERABLE within 2 hours and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

3.7.E. Control Room Emergency Ventilation

3. From and after the date that one of the control room emergency pressurization systems is made or found to be INOPERABLE for any reason, REACTOR POWER OPERATION or refueling operations is permissible only during the succeeding 7 days unless such circuit is sooner made OPERABLE.

4. If these conditions cannot be met, reactor shutdown shall be initiated and all reactors shall be in Cold Shutdown within 24 hours for reactor operations and refueling operations shall be terminated within 2 hours.

SURVEILLANCE REQUIREMENTS

4.7.E. Control Room Emergency Ventilation

3. At least once per operating cycle not to exceed 18 months, automatic initiation of the control room emergency pressurization system shall be demonstrated.

4. During the simulated automatic actuation test of this system (see Table 4.2.G), it shall be verified that the following dampers operate as indicated:

   Close: FCO-150 B, D, E, and F
   Open: FCO-151,
   FCO-152

LIMITING CONDITIONS FOR OPERATION

3.7.G. Containment Atmosphere Dilution System (CAD)

1. The Containment Atmosphere Dilution (CAD) System shall be OPERABLE with:

   a. Two independent systems capable of supplying nitrogen to the drywell and torus.

   b. A minimum supply of 2,500 gallons of liquid nitrogen per system.

2. The Containment Atmosphere Dilution (CAD) System shall be OPERABLE whenever the reactor is in the RUN MODE.

3. If one system is INOPERABLE, the reactor may remain in operation for a period of 30 days provided all active components in the other system are OPERABLE.

4. If Specifications 3.7.G.1 and 3.7.G.2, or 3.7.G.3 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the Cold Shutdown condition within 24 hours.

5. Primary containment pressure shall be limited to a maximum of 30 psig during repressurization following a loss of coolant accident.

SURVEILLANCE REQUIREMENTS

4.7.G. Containment Atmosphere Dilution System (CAD)

1. System Operability

   a. At least once per month cycle each solenoid-operated air/nitrogen valve through at least one complete cycle of full travel and verify that each manual valve in the flow path is open.

   b. Verify that the CAD System contains a minimum supply of 2,500 gallons of liquid nitrogen twice per week.

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

2. The reactor shall not be started up (made critical) from the HOT STANDBY CONDITION unless all of the following conditions are satisfied:

   a. At least one offsite power source is available as specified in 3.9.A.1.c.

   b. Three units 3 diesel generators shall be OPERABLE.

   c. An additional source of power consisting of one of the following:

      (1) A second offsite power source available as specified in 3.9.A.1.c.

      (2) A fourth unit 3 diesel generator OPERABLE.

   d. Requirements 3.9.A.3 through 3.9.A.6 are met.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

2. DC Power System - Unit Batteries (250-V), Diesel-Generator Batteries (125-V)and Shutdown Board Batteries (250-V)

   a. Every week the specific gravity, voltage, and temperature of the pilot cell, and overall battery voltage shall be measured and logged.

   b. Every three months the measurements shall be made of voltage of each cell to nearest 0.1 volt, specific gravity of each cell, and temperature of every fifth cell. These measurements shall be logged.

   c. A battery rated discharge (capacity) test shall be performed and the voltage, time, and output current measurements shall be logged at intervals not to exceed 24 months.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.B. Operation With Inoperable Equipment

3. From and after the date that the 4-kV bus tie board becomes inoperable, REACTOR POWER OPERATION is permissible indefinitely provided one of the required offsite power sources is not supplied from the 161-kV system through the bus tie board.

4. When one unit 3 4-kV shutdown board is INOPERABLE, continued REACTOR POWER OPERATION is permissible for a period of 5 days provided that 2 offsite power sources are available as specified in 3.9.A.1.c and the remaining unit 3 4-kV shutdown boards and associated diesel generators, CS, RHR (LPCI and containment cooling) systems, and all unit 3 480-V emergency power boards are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be shut down and in the COLD SHUTDOWN CONDITION within 24 hours.

SURVEILLANCE REQUIREMENTS

4.9.B. Operation With Inoperable Equipment

3. When a required offsite power source is unavailable because the 4-kV bus tie board or a start bus is INOPERABLE, all unit 3 diesel generators and associated boards shall be demonstrated OPERABLE immediately and daily thereafter. The remaining offsite source and associated buses shall be checked to be ener[illegible] daily.

4. When one unit 3 4-kV shutdown board is found to be INOPERABLE, all remaining unit 3 4-kV shutdown boards and associated diesel generators, CS, and RHR (LPCI and containment cooling) systems supplied by the remaining 4-kV shutdown boards shall be demonstrated to be OPERABLE, immediately and daily thereafter.

LIMITING CONDITIONS FOR OPERATION

3.9.B. Operation With Inoperable Equipment

5. From and after the date that one of the 480-V, diesel auxiliary boards becomes INOPERABLE, REACTOR POWER OPERATION is permissible for a period of 5 days.

6. From and after the date that the 250-V shutdown board 3EB battery or one of the three 250-V unit batteries and/or its associated battery board is found to be INOPERABLE for any reason, continued REACTOR POWER OPERATION is permissible during the succeeding seven days. Except for routine surveillance testing, the NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period, and the plans to return the failed component to an OPERABLE state.

7. When one division of the logic system is INOPERABLE, continued REACTOR POWER OPERATION is permissible under this condition for seven days, provided the CSCS requirements listed in Specification 3.9.B.2 are satisfied. The NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period, and the plans to return the failed component to an OPERABLE state.

SURVEILLANCE REQUIREMENTS

4.9.B. Operation With Inoperable Equipment

5. When one 480-V diesel auxiliary board is found INOPERABLE, the remaining diesel auxiliary board and each unit 3 diesel shall be verified OPERABLE immediately and daily thereafter.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.B Operation With Inoperable Equipment

10. When one 480-V shutdown board is found to be INOPERABLE, the reactor will be placed in HOT STANDBY CONDITION within 12 hours and COLD SHUTDOWN CONDITION within 24 hours.

11. If one 480-V RMOV board mg set is INOPERABLE, REACTOR POWER OPERATION may continue for a period not to exceed seven days, provided the remaining 480-V RMOV board mg sets and their associated loads remain OPERABLE.

12. If any two 480-V RMOV board mg sets become INOPERABLE, the reactor shall be placed in the COLD SHUTDOWN CONDITION within 24 hours.

13. If the requirements for operation in the conditions specified by 3.9.B.1 through 3.9.B.12 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the COLD SHUTDOWN CONDITION within 24 hours.

SURVEILLANCE REQUIREMENTS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.C. Operation in Cold Shutdown Condition

Whenever the reactor is in the COLD SHUTDOWN CONDITION with irradiated fuel in the reactor, the availability of electric power shall be as specified in Section 3.9.A except as specified herein.

1. At least two unit 3 diesel generators and their associated 4-kV shutdown boards shall be OPERABLE.

2. An additional source of power energized and capable of supplying power to the unit 3 shutdown boards consisting of at least one of the following:

   a. One of the offsite power sources specified in 3.9.A.1.c.

   b. A third OPERABLE diesel generator.

3. At least one unit 3 480-V shutdown board must be OPERABLE.

4. One 480-V RMOV board motor generator (mg) set is required for each RMOV board (3D or 3E) required to support operation of the RHR system in accordance with 3.5.B.9.

ENCLOSURE 2

DESCRIPTION AND JUSTIFICATION
BROWNS FERRY NUCLEAR PLANT (BFN)

Description of Change

This proposed change to the BFN Technical Specifications definitions consists of four complementary parts that apply to all three units.

A. First, changes are proposed for definitions 1.0.M, 1.0.M.1, 1.0.M.2, 1.0.M.3, and 1.0.M.4 to:

   1. Directly link the mode of operation to the position of the reactor mode switch,

   2. Add notes which permit the unit to remain in a mode of operation while the reactor mode switch is temporarily moved to another position,

   3. Make these definitions applicable only when there is fuel in the reactor vessel and consider the reactor not to be in any defined mode of operation or operational condition with no restrictions on reactor mode switch position or operability when there is no fuel in the reactor vessel, and

   4. Delete extraneous information which describes the selection functions of the reactor mode switch.

B. The second change is to definition 1.0.S, core alterations, to make this definition:

   1. Applicable only to fuel, sources, incore instruments, and reactivity controls within the reactor pressure vessel,

   2. Applicable only when the vessel head is removed,

   3. Applicable only when fuel is in the vessel, and

   4. Specifically permit core alterations to be completed as necessary to leave the unit in a safe conservative condition when the suspension of core alterations is required.

C. The third area of change involves the definitions 1.0.D, 1.0.H, 1.0.I, 1.0.J, 1.0.K, 1.0.L, and 1.0.X. These are definitions for various reactor conditions. They are being revised to be consistent with the changes proposed for definition 1.0.M previously described and to obtain consistency and completeness throughout the definitions. A new definition, 1.0.D, is being added to define the phrase "prior to startup."

Description of Change (Cont'd)

1. Definition 1.0.H, reactor power operation, is changed to reference the startup/hot standby and run modes instead of the mode switch positions of startup/hot standby and run.

2. Definition 1.0.I, hot standby condition, is relocated to be the new definition 1.0.J. It is revised to reference the reactor mode instead of the mode switch position, to delete any reference to reactor pressure and main steam isolation valve position, and to allow temperature to be below 212° F. A note has been added to this definition to help distinguish between hot standby and startup conditions.

3. The new definition 1.0.I will define the term startup condition as when the withdrawal of control rods for the purpose of making the reactor critical has begun, reactor power is less than or equal to one percent of rated, and the reactor is in the startup/hot standby mode.

4. Definition 1.0.J, cold condition, is relocated to be the new definition 1.0.L. It is also revised to explicitly state that it is applicable to any mode of operation.

5. Definitions 1.0.K, 1.0.L, and 1.0.X, hot shutdown, cold shutdown, and shutdown respectively, are revised and combined into the new definition 1.0.K for shutdown condition. The new shutdown condition definition includes two subdivisions--hot shutdown condition and cold shutdown condition. The new definition of shutdown conditions include the refueling mode as well as the shutdown mode. The two subdivisions will reference the shutdown condition instead of the shutdown mode.

6. The new definition 1.0.D will define the phrase "prior to startup" as meaning prior to the withdrawal of control rods for the purpose of making the reactor critical.

D. The fourth area of change involves making the remainder of the technical specification consistent with the revised definitions. This will necessitate the revision of a number of limiting conditions for operation and surveillance requirements.

   1. Specification 3.1.A states that various Reactor Protection System channels must be operable for each position of the mode switch in table 3.1.A. This is being changed to reference the mode of operation instead of mode switch position.

   2. Note (8) to table 3.2.f for unit 2 is being changed to reference the startup condition and hot standby condition instead of "startup," and also to add "reactor" to "power operation."

   3. Specification 3.3.B.1 requires each control rod to be coupled to its drive or completely inserted and disarmed except in the refuel condition when the reactor is vented. This condition is being changed to reference the shutdown condition instead of refuel condition.

Description of Change (Cont'd)

4. Specification 3.7.A.1.f requires that the reactor be scrammed if torus water temperature exceeds 110° F in startup or power operations. These conditions are being changed to "startup condition, hot standby condition (with all control rods not inserted), and reactor power operations." In addition, 3.7.A.1.e and f are changed so that required actions are in order of increasing suppression pool temperature.

5. Specification 3.7.G.2 requires the Containment Atmosphere Dilution System to be operable with the mode switch in run. This is being changed to reference the run mode.

6. The following specifications, which currently employ phrases such as "prior to reactor startup," "prior to each startup," or "prior to a startup," are being changed to use the newly defined term "prior to startup": 4.3.F.1.a, 3.5.A.1.(1), 3.5.A.4, 3.5.B.1.(1), 3.5.B.14, 3.5.C.1, 3.5.G.1.(1).

7. The following specifications, which currently employ phrases such as "reactor operation," or "power operation," are being changed to reference the explicitly defined phrase "reactor power operation": 3.3.B.2, 3.3.F.2, 3.5.C.3, 3.7.B.3, 3.7.E.3, 3.9.B.3, 3.9.B.4, 3.9.B.5, 3.9.B.6, 3.9.B.7, 3.9.B.8 (units 1 and 2 only), 3.9.B.9 (units 1 and 2 only), 3.9.B.11 (unit 3 only), 3.9.B.13 (units 1 and 2 only).

8. The following specifications, which currently employ phrases such as "shutdown" or "shutdown in the cold condition," are being changed to reference the explicitly defined terms "shutdown condition" or "cold shutdown condition," as applicable: notes for table 3.2.F, 3.3.D, 3.3.E, 3.5.A.3, 3.5.B.8, 4.5.B.14, 3.6.B.3.c, 3.6.C.3, 3.6.E.1, 3.7.A.1.c, 3.9.B.3, 3.9.B.4, 3.9.B.12, 3.9.B.13 (unit 3 only), 3.9.B.14 (units 1 and 2 only), 3.9.B.15 (units 1 and 2 only).

9. The following specifications, which currently employ the word "startup" are being changed to reference the newly defined term "startup condition": 3.6.B.4, 4.6.B.3.a (unit 3 only), 4.6.B.6.a (units 1 and 2 only).

10. The following specifications, which currently employ the words "hot standby" are being changed to reference the newly defined term "hot standby condition": 3.3.F.3, 3.9.B.12 (units 1 and 2), 3.9.B.10 (unit 3).

Additionally, on all pages which are submitted for change, any terms or phrases which are defined in the technical specification definitions section (section 1.0) will be printed entirely in upper case letters. Since this method of highlighting terms with explicit meanings within the technical specification is used in Standard Technical Specifications, and since no changes in wording are proposed, no reason for change or justification will be given for these conversions from lower case to upper case letters.

Reason for Change

A.1 Definitions 1.0.H, 1.0.I, 1.0.M, and 1.0.X imply a direct association of the mode of operation with the position of reactor mode switch. This proposed change will clarify the direct link which is not stated in the current definitions.

2 Certain tests and other operations require that the reactor mode switch be in a certain position. When the position of the mode switch necessary for performance of a test or other operation is different than the position of the mode switch required by the current mode of operation, a conflict of requirements exists. The notes added to the definition will permit the position of the mode switch to be temporarily changed for performance of a test or other operation while the unit does not change its mode of operation, provided that compensatory administrative requirements are met.

3. Definition 1.0.M may currently be understood to apply even though no fuel is in the reactor vessel. Such an interpretation imposes unreasonable operational restraints on the plant.

4. Definitions 1.0.M.1, 1.0.M.2, 1.0.M.3, and 1.0.M.4 contain extraneous information which describes the function of the reactor mode switch position applicable to each mode of operation. This extraneous information serves no purpose. This change will eliminate this information to better focus on the intent of these definitions.

B. Definition 1.0.S does not specifically identify the components to which it is applicable nor does it specify the plant conditions under which it is applicable. In addition, the definition does not specify what actions may be taken when core alterations must be suspended while a component is being handled.

C. Definitions 1.0.H, 1.0.I, 1.0.J, 1.0.K, 1.0.L, and 1.0.X are inconsistent among themselves and with other definitions and do not correlate directly with the proposed change to definition 1.0.M. The definitions for "prior to startup" and "startup condition" are needed to clarify these often used terms and provide an all inclusive set of reactor conditions.

D. These changes are to correct inappropriate references in the technical specifications to mode switch position, hot standby condition, and refuel condition. Many of the changes are to use wording in the body of the technical specification which match the defined terms while retaining the original intent of the specifications.

Justification for Changes

A. The proposed changes to definition 1.0.M, mode of operation, will directly link the mode of operation to a position of the reactor mode switch. This link is implied, but not directly stated in the current definitions by describing the protective system and refuel interlock functions which are in effect for each mode switch position. This change is needed to eliminate extraneous information which serves no useful purpose in this section so that each mode of operation is defined in a straightforward manner. This change is justified in that the intent and requirements of this section are not changed from those which currently appear in the technical specifications.

These proposed changes to definition 1.0.M will allow the unit to be considered not in any mode of operation when there is no fuel in the reactor vessel. Hence, the reactor mode switch may be in any position or be inoperable. When there is no fuel in or above the reactor vessel, no fuel related accident can occur in the reactor vessel, so the reactor mode switch affords no protective function to the plant in this situation. Since the reactor mode switch provides no protection with the reactor vessel defueled, there is no reason to restrict it to any position or to require its operability. This proposed change will allow the reactor mode switch position to be changed or the switch disabled as necessary to permit testing and maintenance on a defueled unit without imposing restrictions on that unit which provide no safety function.

Footnote (1) will allow moving the mode switch to any position to perform required tests or maintenance without changing the mode of operation, provided that all control rods are verified to remain fully inserted (second person verification by a licensed operator or other technically qualified member of the plant staff of the all rods in condition is required). This note is necessary to allow testing or maintenance which may require the mode switch to be in a position other than that for the current mode of operation. This note will apply to the shutdown, refuel, and startup/hot standby modes (with all rods in). With the reactor mode switch in the shutdown position, the reactor is designed to be shutdown (i.e., subcritical) with all control rods fully inserted. To enforce this condition, the mode switch in the shutdown position provides a scram signal to the Reactor Protection System (bypassed after two seconds) and a rod withdrawal block signal so that all control rods will remain fully inserted which is the intent of the shutdown mode. The administrative requirement for second person verification that all rods remain fully inserted will effectively compensate for the scram and rod block signals which will be bypassed when the mode switch is moved from the shutdown position. Therefore, the use of this note for the shutdown mode will not allow any plant conditions different from those currently allowed by the technical specifications. With the mode switch in the refuel position, interlocks ensure that during fuel movements in or over the core all control rods remain fully inserted and that no more than one control rod can be withdrawn from its fully inserted position. The administrative requirement for second person verification of the all rods in condition will clearly meet the intended function of these interlocks when the

Justification for Changes (Cont'd)

interlocks are bypassed by moving the mode switch from the refuel position. Therefore, the use of this note for the refuel mode will meet the safety design basis of the refueling interlocks and will not allow any plant conditions different from those currently allowed by the technical specifications. In the startup/hot standby position, the mode switch selects the neutron monitoring system scrams for low neutron flux level operation, such as the average power range monitor (APRM) 15 percent power scram and the intermediate range monitor (IRM) 120/125 of scale scram. The administrative requirement for second person verification of the all-rods-in condition will clearly provide the protection against high heat generation rates normally afforded by these scrams since the reactor will remain subcritical during the time these scrams are bypassed by moving the mode switch from the startup/hot standby position. Therefore, the use of this note for the startup/hot standby mode will not allow any plant conditions different from those allowed by the current technical specifications. Since, for all of its proposed applications, the addition of footnote (1) to this definition will not allow any plant conditions to exist which are different from those currently allowed by the technical specifications. This proposed change will not adversely affect nuclear safety.

Footnote (2) relating to the mode of operation definition will allow placing the mode switch in the refuel position to perform maintenance on a single control rod drive per specification 3.10.A.5 if the reactor coolant temperature is below 212° F. This note applies to the shutdown mode only, and the reactor would be considered to be in the shutdown mode with the mode switch in the refuel position under the terms of this note. The proposed note requires that all refueling interlocks be operable (per specification 3.10.A.1) so that the one-rod-out interlock of the refuel position will prevent any further control rod withdrawal if any single rod is not at its fully inserted position. Since this note will be used to remove control rod drives from the reactor vessel, the control blade associated with that drive will be disabled in the fully withdrawn position and will temporarily be incapable of being inserted. To compensate for this condition, the control rods which are face adjacent and diagonally adjacent to the withdrawn rod will be electrically disarmed in the full-in position per specification 3.10.A.5 since these rods would have the highest control rod worths. In this manner, it is ensured that the reactor will remain subcritical since the shutdown margin analysis assumes a single-rod-out condition. Thus, since it is ensured that the reactor, in the shutdown mode, will remain subcritical with the required shutdown margin, no assumptions for any accident analysis are changed, and the addition of this footnote will not adversely impact nuclear safety. The use of this note would only be allowed in the cold condition, so that it would be similar in scope to note ## of table 1.2 in General Electric (BWR-4) Standard Technical specifications (GE-STS, NUREG-0123).

Justification for Changes (Cont'd)

Footnote (3) relating to the mode of operation definition will allow placing the mode switch in the refuel position to recouple or withdraw a single control rod provided that the one-rod-out interlock is operable. This note applies to the shutdown mode only, and the reactor will be considered to be in the shutdown mode with the mode switch in the refuel position under the terms of this note. Since the proposed note requires the one-rod-out interlock of the refuel mode switch position to be operable, no more than one control rod will be withdrawn from the full-in position at a time. This interlock will ensure that the reactor will remain subcritical at all times, since the shutdown margin analysis assumes a single rod-out condition. Control rod drives which are moved under the terms of this note will be operable so the adjacent drives need not be disarmed. Since it is assured that the reactor in the shutdown mode will remain subcritical with the required shutdown margin, no assumptions of any accident analysis are changed, and the addition of this footnote will not adversely affect nuclear safety. This note is similar in scope to note *** of table 1.2 in GE-STS, NUREG-0123.

Footnote (4) relating to the mode of operation definition will allow placing the mode switch in the startup/hot standby position to test the rod worth minimizer (RWM) and the Rod Sequence Control System (RSCS). This note applies to the shutdown mode only, and the reactor would be considered to be in the shutdown mode with the mode switch in the startup/hot standby position. This exception is necessary because certain features of the RWM and RSCS cannot be tested unless the mode switch is placed in the startup/hot standby position. The testing required involves selection and withdrawal of control rods to verify that the RWM and RSCS are enforcing rod patterns correctly. Since this test will only have one rod withdrawn from its fully inserted position at a time, the reactor cannot achieve criticality and the intent of the shutdown mode will be maintained. The addition of this note will only clarify existing requirements for testing of the RWM and RSCS and will not change any procedures for operation or testing of these systems. Since this note only clarifies existing surveillance requirements, but does not change their intent or application, it will not adversely impact nuclear safety. This exception to the mode switch position is adapted from GE-STS 3.1.4.1 and 3.1.4.2.

B. The changes to definition 1.0.S, core alterations, are proposed to clarify the components to which this definition will apply. Core alterations will be limited to fuel, sources, incore instruments, and reactivity controls, which are the components which can contribute to an accident during core alterations. Handling of components such as cameras or tools within the reactor vessel would not be considered a core alteration since these components can not contribute to an accident while being handled in the vessel. The times to which this definition would apply will be limited to when the vessel head is removed and when fuel is in the vessel. The interlocks and systems which are required to be in effect during core alterations provide no protective function when the vessel head is in place or when there is no fuel in the vessel, so there is no reason to extend this definition to these conditions. In addition, the proposed

Justification for Changes (Cont'd)

changes will allow completion of a movement of a component to a safe conservative position when core alterations are suspended. This change will prevent leaving a component in an intermediate position (such as a fuel bundle suspended from the refueling bridge) for an extended period of time. This addition will not allow any new moves to be initiated when core alterations are suspended. Since all of these proposed changes to specification 1.0.S are clarification only, the intent of this definition is unchanged and there is no impact on nuclear safety.

C.1 The proposed definition 1.0.H, reactor power operation, is only changed to reference the startup/hot standby and run modes instead of mode switch positions of startup and run. This is a necessary administrative change to provide consistency between the mode and condition definitions. This proposed amendment in no way changes the intent of the current definition, so it will not adversely affect nuclear safety.

C.2 The proposed definition 1.0.J, hot standby condition, will alter the current definition of hot standby to remove the reference to reactor vessel pressure being limited to 1055 psig and remove the reference to the main steam isolation valve (MSIV) position. This definition is necessary to describe the condition of the reactor at low power levels such as prior to entering the startup condition, and during a controlled shutdown after reactor power drops below one percent of rated thermal power in the startup/hot standby mode. This condition is defined similarly to the startup condition, but the distinction between the two is found in the intended condition of operation toward which the reactor is proceeding. For example, if an equipment malfunction results in an operator reducing power below one percent of rated thermal power in the startup/hot standby mode to meet the terms of the generic LCO found in definition 1.0.C, the reactor will be in the hot standby condition and not in the startup condition (even though the reactor may still be critical). If the equipment malfunction is remedied and the operator then begins to withdraw control rods to increase power, the reactor will then be in the startup condition and not in the hot standby condition, although the physical configuration of the plant has not changed. A note has been added to the hot standby definition to make this distinction clear in the technical specification.

The deletion of the reference to reactor vessel pressure found in the current definition of the hot standby condition will not change plant operation or requirements in any way. This reference serves no purpose in the definitions section, since vessel pressure limits are well documented in other sections of technical specification (such as the limiting safety system settings for relief valve setpoints and nuclear system high pressure scram setpoint, and table 3.1.A for RPS scram instrumentation requirements) and other design documents. This change is justified because the change only removes extraneous information from this definition and does not reduce requirements in any way.

Justification for Changes (Cont'd)

The deletion of the requirement to have MSIVs closed in the hot standby condition will allow the reactor to use the main condenser as a heat sink in this condition. The existing requirement to have the MSIVs closed has made the hot standby condition an undesirable condition because it isolates the reactor from the main condenser (its normal source of heat removal) and forces the use of relief valves to control reactor pressure. Since no accident or transient analysis involving MSIV closure assumes that the MSIVs are closed initially, and since this change will not affect any MSIV isolation function, no assumptions used in any accident for transient analysis are invalidated by this proposed change. Therefore, there is no effect on nuclear safety resulting from allowing the MSIVs to be open in the hot standby condition.

The change to allow reactor coolant temperature to drop below 212° F is to provide a defined condition for the reactor when it is in the startup/hot standby mode, power is less than one percent, but control rods are not being withdrawn for the purpose of making the reactor critical or increasing power. This change is necessary to provide completeness in the definitions. This change will allow the reactor to be in a cold, more conservative state while in the hot standby condition. This change is justified since there is no safety significance to allowing reactor coolant temperature to drop below 212° F as this is only an arbitrarily selected point of reference. Hence, this change will not affect nuclear safety.

C.3 The proposed definition 1.0.I, startup condition, will define the condition of starting up, as opposed to the startup mode. This condition will be in existence when the reactor is in the startup/hot standby mode, reactor power is less than one percent of rated thermal power, and when the withdrawal of control rods for the purpose of making the reactor critical has begun. This definition is necessary to describe the condition of the reactor between the time of initially withdrawing control rods and the time of reaching reactor power operation. This proposed definition is justifiable because it is consistent with safe operation for all of its applications within the technical specifications, as noted in the following paragraphs:

Note (8) for table 3.2.F requires high range primary containment radiation recorders and wide range gaseous effluent radiation monitors to be in operation in the startup condition (among others). These radiation recorders/monitors are designed for postaccident monitoring of radiation levels. These monitors do not perform any function before startup, since the accidents for which they were designed could not be initiated from this condition. Hence, this proposed definition would still require these monitors to be operable at the times they were intended to be operable, and the intent of the current technical specifications is unchanged.

Justification for Changes (Cont'd)

Specification 3.6.B.4 establishes coolant chemistry limits for a depressurized reactor, but specifically does not apply to the startup condition. Once rod withdrawal for the purpose of making the reactor critical has begun, the intention to pressurize the reactor vessel has been demonstrated, so the more restrictive limits of 3.6.B.1 are applicable. However, before rod withdrawal has begun, the reactor is in physically the same state as if it were in the cold shutdown condition so the less restrictive limits of 3.6.B.4 apply. For this application, the proposed definition of startup condition would not result in any physical plant configurations different from those currently allowed by the technical specification.

Specification 4.6.B.6.a (units 1 and 2) and 4.6.B.3.a (unit 3) require additional surveillance of the reactor coolant chemistry under startup conditions. The LCO associated with this surveillance requirement 3.6.B.6 (units 1 and 2) and 3.6.B.5 (unit 3) is applicable only when the reactor is critical. This can only occur after control rod withdrawal with intent to go critical has begun, so the proposed definition of startup condition does not change the intent of specification 4.6.B.6.a (units 1, and 2) and 4.6.B.3.a (unit 3) and will not adversely affect nuclear safety.

Specification 3.7.A.1.f requires a reactor scram during startup (among other conditions) if the suppression pool water temperature exceeds 110° F. The "startup" referred to in this specification is the startup condition, not the startup mode, since initiating a reactor scram accomplishes nothing unless control rod withdrawal for the purpose of going critical has begun. Therefore, the proposed definition of startup condition does not change the intent of this specification. As part of this amendment request, the "startup" in this specification will be changed to "startup conditions, hot standby conditions (with all rods not fully inserted)" to clarify the intention. See justification D.5 for additional information.

C.4 The proposed definition 1.0.L, cold condition, is revised to explicitly state its applicability in any mode of operation. This is an administrative change that does not alter any current technical specification requirements or allow any new operational conditions, so this change will not have any impact on nuclear safety.

C.5 The proposed definition 1.0.K, shutdown condition, will provide an explicit definition for the shutdown condition and will consolidate the hot shutdown and cold shutdown definitions into one section. This definition will allow the reactor to be in the shutdown mode or in the refuel mode and be considered in the shutdown condition. In this condition, the reactor mode switch will be in the shutdown or refuel positions, with the only exceptions as provided by the notes to definition 1.0.M (already discussed). These mode switch positions will allow at most only one control rod to be withdrawn from the fully inserted position at a time. Thus, since the reactor is analyzed for adequate shutdown margin with the analytically determined highest worth rod fully withdrawn, it is ensured that the reactor will always be subcritical while in the shutdown condition.

Justification for Changes (Cont'd)

The hot shutdown condition will simply be defined as the condition which exists when the reactor is in the shutdown condition with average reactor coolant temperature greater than 212° F. This is similar to the current definition of hot shutdown, with the exception that the new definition of shutdown condition will be referenced instead of the shutdown mode. The intention of this definition is not changed by this amendment request since, as before, the reactor will always be subcritical with average coolant temperature above 212° F when in the hot shutdown condition.

The cold shutdown condition will simply be defined as the condition which exists when the reactor is in the shutdown condition with average reactor coolant temperature equal to or less than 212° F. This is similar to the current definition of cold shutdown, with the exception that the new definition of shutdown condition will be referenced instead of the shutdown mode. The intention of this definition is not changed by this amendment request since, as before, the reactor will always be subcritical with average coolant temperature equal to or less than 212° F when in the cold shutdown condition.

C.6 The proposed definition 1.0.D, prior to startup, will provide a definition of the phrase "prior to startup" to explicitly state the intention of this frequently used phrase. Prior to startup will be defined as prior to the withdrawal of control rods for the purpose of going critical. Hence the "startup" used in this phrase will be referring to the startup condition, and not to the startup mode. This definition is necessary to make this distinction between modes and conditions. This change is justified because it is consistent with safe operation for all of its applications within the technical specifications, as is noted in the following paragraphs.

The phrase "prior to startup" appears in the LCO for the Core Spray System (CSS), the RHR, the HPCI, the RCIC, and the Automatic Depressurization System (ADS). Each of these core and containment cooling systems is required by the technical specifications to be operable prior to startup from a cold condition (the actual wording in the current technical specification uses "prior to reactor startup" or "prior to a startup," but these will all be changed to simply read "prior to startup" as a part of this package). By the proposed definition, these systems would be required to be operable before withdrawing control rods with the intention of going critical. With the reactor in a cold condition and with all control rods inserted (before being withdrawn for the purpose of going critical), the reactor is physically in the same condition as if it were in cold shutdown. In the cold shutdown condition, these core and containment cooling systems are not required to be operable. Therefore, this proposed changes will not allow any physical plant configuration different from those currently allowed by the technical specifications. Hence, as it applies to these LCOs, this proposed definition will not have any impact on nuclear safety.

Justification for Changes (Cont'd)

Specification 3.6.B.1 establishes coolant chemistry limits for conductivity and chlorides which must be met prior to startup and at low steaming rates. The proposed definition for "prior to startup" will make this specification applicable before withdrawing control rods with the intent to go critical. Until this time, the reactor will physically be in the same condition as if it were in the shutdown condition and the chemistry limits for this condition would be applicable. Thus, this proposed definition, for this application, would not result in any physical plant conditions different from those currently allowed by the technical specifications, and therefore would not affect nuclear safety.

D.1 The change to specification 3.1.A is proposed to correct a reference within this specification. This specification currently references each "position of the mode switch" as given in table 3.1.A. However, table 3.1.A lists each "mode of operation" as opposed to switch positions. Since the new definitions of modes of operation are directly tied to the mode switch position (with the only exceptions as provided in the footnotes to definition 1.0.M--see justification A), this change is only administrative in nature and does not change the intent of this specification and will not affect safety.

D.2 The change to note (8) for table 3.2.F is proposed to make use of the revised definitions so that it will be clear as to which conditions are applicable. The addition of the word "reactor" to "power operation" is only to use the explicitly defined phrase from section 1.0.H, and does not change the intended reactor state to which these words refer. The addition of the word "condition" to "startup" is only to use the explicit definition from section 1.0.I. The addition of "hot standby condition," along with "startup condition," will describe the same reactor states previously referred to by "startup" (i.e., startup mode, less than one percent rated thermal power). Since the reactor states to which this note is applicable are not changed, there will be no change in plant operation and no impact on nuclear safety.

D.3 The change to specification 3.3.B.1 is proposed to replace "refuel condition" with "shutdown condition." This is necessary since there is no definition for refuel condition in the technical specifications. The shutdown condition includes both the shutdown and refuel modes of operation. In this condition, there are interlocks in place which prevent withdrawal of more than one rod at a time from the fully inserted position, so there is no need to electrically disarm directional control valves to prevent rod withdrawal. Hence, the intent of this specification (which is to help prevent control rod drop accidents while at the same time allowing for control rod drive maintenance) is not affected by this proposed change, so there is no impact on nuclear safety.

Justification for Changes (Cont'd)

D.4 The change to specification 3.7.A.1.f is to identify the plant conditions under which the reactor must be scrammed if the suppression pool water temperature exceeds 110° F. The intent of this specification is to quickly reduce reactor power to remove the source of heat addition to the suppression pool when its temperature becomes too high to assure adequate pressure suppression capability. This intent is fulfilled by scramming the reactor to rapidly insert all control rods. The conditions to which this action would apply would be those conditions which allow control rods to be withdrawn such that the reactor is critical. These conditions are the startup condition, the Hht standby condition (if any control rod is not fully inserted), and reactor power operation. This action would not be applicable if the reactor was in a condition such that all control rods were fully inserted into the core, or if at most only one rod was withdrawn from its fully inserted position, since in these conditions actuating the RPS to scram the reactor would clearly not result in a reduction in core thermal power. Therefore, this proposed change would use the newly defined conditions from this technical specification amendment but would not change the intent of this LCO, so that there would be no adverse safety effects resulting from this change.

D.5 This change to specification 3.7.G.2 is proposed to clarify the intent of this LCO. This change is only administrative in nature, however, since the new definition of the run mode is tied directly to the run position of the reactor mode switch. The only exception is as described in footnote (1) to definition 1.0.M, which would allow the mode switch to be in run and the reactor to be in another mode, and this exception is addressed in justification A. Therefore, the intent of this specification is unchanged by this proposed amendment, and there is no effect on safety.

D.6 The change to specification 4.3.F.1.a is proposed to change from "prior to each startup" to "prior to startup" to describe when the SDV vent and drain valves must be tested. This change is only to make use of the explicitly defined phrase "prior to startup" and does not change the intent of this specification in any way. By the definition of "prior to startup," this testing must be performed prior to withdrawing rods for the purpose of going critical. Until such time as rods are withdrawn to go critical, the reactor is in the same physical state as if it were in the shutdown condition when the vent and drain valves are not required operable, so there is no need to test for their operability until rod withdrawal is to begin. Therefore, this change will not affect safety.

The changes to specifications 3.5.A.1.(1), 3.5.A.4, 3.5.B.1(1), 3.5.B.14, and 3.5.C.1 are proposed to change from "prior to reactor startup" to "prior to startup" to describe when the particular systems are required to be operable. In each case, the change is only to make use of the explicitly defined phrase "prior to startup" to avoid any interpretation problems. This change will not alter the intent or application of any of these LCOs, so nuclear safety will be unaffected.

Justification for Changes (Cont'd)

The change to specification 3.5.G.1(1) is proposed to change from the phrase "prior to a startup" to the phrase "prior to startup.' This change will only make use of the new definition for "prior to startup," and does not change the intent of this LCO, so it will not affect safety. These changes are also discussed in justification C.6.

D.7 The change to section 3.3.F.2 is proposed to merely insert the word "power" in this specification to invoke the phrase "reactor power operation" since this phrase has an explicit definition within the technical specifications and "reactor operation" does not. This would allow operation in the startup/hot standby and run modes above one percent power with a single SDV vent or drain valve inoperable, provided that the redundant vent or drain valve was operable to perform the safety function. This change does not change the intent of this specification and will not affect nuclear safety.

The change to specification 3.5.C.3 is proposed to change the condition given in this LCO from "power operation" to "reactor power operation." This specification will require that two RHRSW pumps be available for standby coolant supply when the reactor is in the startup/hot standby or run mode above one-percent power. This change is only to make use of this explicitly defined phrase from the definitions. This change does not alter the intent or application of this specification, so it will not affect safety.

The proposed changed to specification 3.7.B.3 will merely change "reactor operation" to "reactor power operation" to make use of a condition which has an explicit definition within the technical specifications. This condition will allow continued operation in the startup or run modes above one percent rated thermal power with one Standby Gas Treatment System (SGTS) train inoperable for a period of seven days, provided that all active components of the other two SGTS trains are operable. The intent of this specification is to allow normal operation to continue temporarily with a redundant safety system inoperable, since the requirement to have the other two SGTS trains operable ensures that the safety function will be fulfilled if needed. This proposed change will not result in any change in the way the plant is operated, nor will it reduce any requirements, so this change will not affect safety.

The proposed change to specification 3.7.E.3 will merely change "reactor operation to "reactor power operation" to make use of a condition which has an explicit definition within the technical specifications. This change will allow continued operation in the startup or run modes above one percent rated thermal power with one Control Room Emergency Ventilation (CREV) system inoperable for a period of seven days. The intent of this specification is to allow normal operation to continue temporarily with a redundant safety system inoperable, since the other CREV system will be operable to perform the safety function if needed. This proposed change will not result in any change in the way the plant is operated, nor will it reduce any requirements, so it will not affect nuclear safety.

Justification for Changes (Cont'd)

The changes to specification 3.9.B.3 are proposed to implement the new definitions for "reactor power operation" and "cold shutdown condition." The intent of this specification is to allow normal operations to continue temporarily with one diesel generator inoperable. The proposed change will allow such operations in the startup or run modes at greater than one percent rated thermal power. These operating conditions are the same as those allowed by the current specification, so there will be no change in plant procedures or operations introduced by the use of the phrase "reactor power operation." This specification also requires that the reactor be shut down in the cold condition if all of the equipment operability requirements cannot be met. The intention here is to make the reactor subcritical and depressurized. This intent is unchanged by the use of the phrase "in the cold shutdown condition," so this change will not alter any plant procedures or operations. Since these changes will not affect the intention of this specification, they will not affect nuclear safety.

The changes to specification 3.9.B.4 are proposed to implement the new definitions for "reactor power operation" and "cold shutdown condition." The intent of this specification is to allow normal operations to continue temporarily with with one 4-kv shutdown board inoperable. The proposed changes will allow operation in the startup and run modes above one percent rated thermal power. These operating conditions are the same as those allowed by the current specification, so there will be no change in plant procedures or operations introduced by the use of "reactor power operation." This specification also requires that the reactor be shutdown in the cold condition if all of the equipment operability requirements cannot be met. The intent here is to make the reactor subcritical and depressurized. This intent is unchanged by the use of "cold shutdown condition." This change will not alter any plant procedures or operations. Since these changes will not affect the intention of this specification, they will not affect nuclear safety.

The change to specifications 3.9.B.4 thru 3.9.B.9 are all to implement the new definition of "Reactor Power Operation." Each of the LCOs addresses operation with inoperable equipment. The intention of these specifications is to allow normal operation to continue temporarily with a defined part of the auxiliary electrical system inoperable. Under this proposed change such operation will be permitted in the startup and run modes above one percent rated thermal power. These conditions are the same as those allowed by the current technical specifications, so these proposed changes will not result in any change in plant procedures or operation. Therefore, since these proposed changes will not alter the intention of the current specifications, they will not affect nuclear safety.

Justification for Changes (Cont'd)

D.8 The change to specification 3.3.D is proposed to make use of the explicitly defined terms by replacing "shutdown" with "placed in the Shutdown condition." By the definition of shutdown condition, the reactor will be placed in either the shutdown or refuel modes when a reactivity anomaly exists. Thus, the reactor will be made subcritical and will remain that way until the cause of the anomaly is determined and corrected. Since this will not change the intent of the current specification, there will be no adverse effect on nuclear safety.

The changes for specifications 3.5.A.3 and 3.5.B.8 are proposed to change from the phrase "shutdown and in the cold condition" to "placed in the cold shutdown condition" for these two action statements for the CSS and the RHR System. In each case these changes are only to allow use of an explicitly defined condition from the definitions and do not change the intent of these two LCOs, so nuclear safety is unaffected by these changes.

The change to specification 3.6.B.3.c is proposed to clarify that the plant is to be placed in the shutdown condition if pH limits on coolant chemistry cannot be maintained. This change will allow use of the explicitly defined phrase "shutdown condition" from the technical specification definitions to avoid possible confusion with the shutdown mode. In the shutdown condition the reactor will be subcritical at all times, so the intent of this specification is fulfilled by the new definition of the shutdown condition and nuclear safety is unaffected.

The change to specifications 3.6.C.3 and 3.6.E.1 will replace the words "shutdown in the cold condition" with "placed in the cold shutdown condition." This change will allow use of an explicitly defined condition within the technical specification and will not change the intent of these action statements, which is to make the reactor subcritical and depressurized. Hence, this change will not affect safety.

The change to specification 3.9.B.15 is proposed to implement the new definition of "cold shutdown condition." This specification currently requires that the reactor be shut down and in the cold condition if the LCOs for inoperable electrical equipment cannot be met. The intention here is that the reactor be made subcritical and the reactor vessel be depressurized. This intention is not changed by the use of the phrase "in the cold shutdown condition," since this will require being in the shutdown or refueling mode with reactor coolant temperature below 212°F. Since the intent of this specification is unchanged, nuclear safety is unaffected by this change.

D.9 The change to specification 3.6.B.4 will clarify that this LCO does not apply to the startup condition. This LCO gives relaxed coolant chemistry limits which apply to a depressurized vessel only. However, during startup conditions, where there exists an intent to go critical and increase power with the associated changes in temperature and pressure, the more restrictive limits of specification 3.6.B.1 would apply. Hence, this change will not alter the intent of this specification and so will not affect nuclear safety.

ENCLOSURE 3

BROWNS FERRY NUCLEAR PLANT (BFN)
DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION
UNITS 1, 2, AND 3

Description of Amendment Request

The proposed amendment would change the technical specification of BFN units 1, 2, and 3 by revising the BFN Technical Specification definition as follows:

A. Definitions 1.0.M, 1.0.M.1, 1.0.M.2, 1.0.M.3, and 1.0.M.4 are changed to:

   1. Directly link the mode of operation to the position of the reactor mode switch.

   2. Permit the position of the reactor mode switch to be temporarily changed for performance of a test or other operation while the unit does not change its mode of operation.

   3. Make these definitions applicable only when there is fuel in the reactor. The unit would be considered not to be in any defined mode of operation or operational condition with no fuel in the reactor vessel.

   4. Delete extraneous information which describes the selection functions of the reactor mode switch. Specify exceptions to the definitions of modes of operation and operational conditions relative to the reactor mode switch position.

B. Definition 1.0.S is changed to:

   1. Specify the specific core components whose addition, removal, relocation, or movement within the reactor vessel constitutes a core alteration.

   2. Specify that handling of these core components only constitutes core alteration when there is fuel in the reactor vessel.

   3. Permit a core alteration to be completed as necessary to leave the unit in a safe, conservative condition when the suspension core alterations is required.

C. Definitions 1.0.H, 1.0.I, 1.0.J, 1.0.K, 1.0.L, and 1.0.X are changed to make these definitions consistent with the definitions of 1.0.M, 1.0.M.1, 1.0.M.2, 1.0.M.3, and 1.0.M.4 which link the mode of operation directly to the reactor mode switch position, and to improve the clarity and consistency of these definitions.

Description of Amendment Request (Cont'd)

D. A new definition is added which defines startup as "The withdrawing of control rods to make the reactor critical."

E. Administrative changes are made to the limiting conditions and surveillance requirements to invoke the terms defined in a concise manner.

Basis for Proposed No Significant Hazards Consideration Determination

NRC has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92(c). A proposed amendment to an operating license involves no significant hazards considerations if operation of the facility in accordance with the proposed amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated, or (2) create the possibility of a new or different kind of accident from an accident previously evaluated, or (3) involve a significant reduction in a margin of safety.

This proposed change emphasizes the direct relationship between the reactor mode switch position and mode of operation and operational conditions and does nothing to diminish any previous requirement for an assumption of this relationship.

The footnotes which have been added to definitions 1.O.M.3 and 1.O.M.4 were adapted from GE-STS (BWR/4) definition table 1.2, technical specifications 3/4.1.4.1, 3/4.3.1.4.2, and 3/4.9.1.2. The functions of the reactor mode switch which are disabled by temporary movement to another position necessary for performance of required tests or maintenance authorized by the shift operations supervisor are compensated for by administrative controls. Where control rod movement restrictions are relaxed by movement of the reactor mode switch from the refuel or shutdown position to the startup/hot standby or run position, compensatory administrative controls are imposed, such as second party verification that all control rods remain fully inserted. Where refueling interlocks are made inoperable by movement of the reactor mode switch from the refuel position, compensatory administrative requirements such as prohibiting other core alterations are imposed. Similar administrative control compensations are made for disabling the one-rod-out interlock of the refuel position and the 15 percent of rated power scram of the refuel and startup/hot standby positions.

When there is no fuel in the reactor vessel, none of the accidents previously analyzed involving a fuel related accident in or above the reactor vessel can occur and no new accidents are created.

This change deletes extraneous information on the interlocks selected by mode switch position that play no part in the application of the definitions. The individual functions that the reactor mode switch positions select which are safety-related are required to be operable during the applicable operational conditions elsewhere in technical specifications.

Basis for Proposed No Significant Hazards Consideration Determination (Cont'd)

The core components specified (fuel, sources, incore instruments, and reactivity controls) are the only components whose addition, removal, relocation, or movement could contribute to an accident during core alterations.

Handling of the core components within the reactor vessel has no effect on core reactivity when there is no fuel in the reactor vessel.

Should a core alteration be in progress when it becomes necessary to suspend core alterations, it may be necessary to complete a movement in order to leave the unit in a safe and conservative condition.

1. The proposed changes do not result in a change in the plant configuration. Rather they attempt to apply a cohesive set of definitions and reference them throughout the body of the technical specifications. Since the proposed change does not affect the manner in which the plant was designed to operate, there is not an increase in the probability or consequences of an accident previously evaluated.

2. The proposed change does not affect normal or emergency operating procedures for the plant. These changes are mostly administrative in nature and will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed changes actually increase the overall safety of the plant by explicitly defining phrases in the technical specifications that were previously open to interpretation.

Determination of Basis for Proposed No Significant Hazards

Since the application for amendment involves a proposed change that is encompassed by the criteria for which no significant hazards consideration exists, TVA has made a proposed determination that the application involves no significant hazards consideration.