UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-280

SURRY POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 199
License No. DPR-32

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company (the licensee) dated June 9, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-32 is hereby amended to read as follows:

   (B) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 199 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

B.C. Buckley for

David B. Matthews, Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical Specifications

Date of Issuance: May 31, 1995

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-281

SURRY POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 199
License No. DPR-37

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company (the licensee) dated June 9, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-37 is hereby amended to read as follows:

   (B) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 199, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

B. C. Buckley for

David B. Matthews, Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical Specifications

Date of Issuance: May 31, 1995

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 199 TO FACILITY OPERATING LICENSE NO. DPR-32

AMENDMENT NO. 199 TO FACILITY OPERATING LICENSE NO. DPR-37

DOCKET NOS. 50-280 AND 50-281

Revise Appendix A as follows:

Remove Pages	Insert Pages
TS 3.1-4	TS 3.1-4
TS 3.2-1	TS 3.2-1
TS 3.2-2	TS 3.2-2
TS 3.2-3	TS 3.2-3
TS 3.2-3a	- - -
TS 3.2-4	TS 3.2-4
TS 3.2-5	TS 3.2-5
TS 3.2-6	- - -
TS 3.3-1 thru TS 3.3-7	TS 3.3-1 thru TS 3.3-5
TS 3.4-2	TS 3.4-2
TS 3.4-4	TS 3.4-4
TS Figure 3.8-1	TS Figure 3.8-1
TS 3.13-1 thru TS 3.13-5	TS 3.13-1 thru TS 3.13-2
TS 3.16-5	TS 3.16-5
TS 4.1-7	TS 4.1-7
TS 4.1-9b	TS 4.1-9b
TS 4.1-9d	TS 4.1-9d
TS 4.1-10	TS 4.1-10
TS 4.5-2	TS 4.5-2
TS 4.11-1 and TS 4.11-2	TS 4.11-1 thru 4.11-4

4. Reactor Coolant Loops

   a. Loop stop valves shall not be closed in more than one loop unless the Reactor Coolant System is connected to the Residual Heat Removal System and the Residual Heat Removal System is OPERABLE.

   b. POWER OPERATION with less than three loops in service is prohibited. The following loop isolation valves shall have AC power removed and their breakers locked, sealed or otherwise secured in the open position during POWER OPERATION:

Unit No. 1	Unit No. 2
MOV 1590	MOV 2590
MOV 1591	MOV 2591
MOV 1592	MOV 2592
MOV 1593	MOV 2593
MOV 1594	MOV 2594
MOV 1595	MOV 2595

5. Pressurizer

   a. The reactor shall be maintained subcritical by at least 1% until the steam bubble is established and the necessary sprays and at least 125 KW of heaters are operable.

   b. With the pressurizer inoperable due to inoperable pressurizer heaters, restore the inoperable heaters within 72 hours or be in at least HOT SHUTDOWN within 6 hours and the Reactor Coolant System temperature and pressure less than 350°F and 450 psig, respectively, within the following 12 hours.

   c. With the pressurizer otherwise inoperable, be in at least HOT SHUTDOWN with the reactor trip breakers open within 6 hours and the Reactor Coolant System temperature and pressure less than 350°F and 450 psig, respectively, within the following 12 hours.

3.2. CHEMICAL AND VOLUME CONTROL SYSTEM

Applicability

Applies to the operational status of the Chemical and Volume Control System.

Objective

To define those conditions of the Chemical and Volume Control System necessary to ensure safe reactor operation.

Specification

A. When fuel is in a reactor, there shall be at least one flow path to the core for boric acid injection. The minimum capability for boric acid injection shall be equivalent to that supplied from the refueling water storage tank.

B. The reactor shall not be critical unless:

1. At least two boron injection subsystems are OPERABLE consisting of:
    a. A Chemical and Volume Control subsystem consisting of:
        1. One OPERABLE flow path,
        2. One OPERABLE charging pump,
        3. One OPERABLE boric acid transfer pump,
        4. The common OPERABLE boric acid storage system with:
            a. A minimum contained borated water volume of 6000 gallons per unit,
            b. A boron concentration of at least 7.0 weight percent but not more than 8.5 weight percent boric acid solution, and
            c. A minimum solution temperature of 112°F.
            d. An OPERABLE boric acid transfer pump for recirculation.

b. A subsystem supplying borated water from the refueling water storage tank via a charging pump to the Reactor Coolant System consisting of:

1. One OPERABLE flow path,
2. One OPERABLE charging pump,
3. The OPERABLE refueling water storage tank with:
   a. A minimum contained borated water volume of 387,100 gallons,
   b. A boron concentration of at least 2300 ppm but not more than 2500 ppm, and
   c. A maximum solution temperature of 45°F.

2. One charging pump from the opposite unit is available with:

a. the pump being OPERABLE except for automatic initiation instrumentation,
b. offsite or emergency power may be inoperable when in COLD SHUTDOWN, and
c. the pump capable of being used for alternate shutdown with the opening of the charging pump cross-connect valves.

C. The requirements of Specification 3.2.B may be modified as follows:
1. With only one of the boron injection subsystems OPERABLE, restore at least two boron injection subsystems to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 6 hours.
2. With the refueling water storage tank inoperable, restore the tank to OPERABLE status within one hour or place the reactor in HOT SHUTDOWN within the next 6 hours.

a. For conditions where the RWST is inoperable due to boron concentration or solution temperature not being within the limits of Specification 3.3.A.1, restore the parameters to within specified limits in 8 hours or place the reactor in HOT SHUTDOWN within the next 6 hours.

3. With no charging pump from the opposite unit available, return at least one of the opposite unit's charging pumps to available status in accordance with Specification 3.2.B.2 within 7 days or place the reactor in HOT SHUTDOWN within the next 6 hours.

D. If the requirements of Specification 3.2.B are not satisfied as allowed by Specification 3.2.C, the reactor shall be placed in COLD SHUTDOWN within the following 30 hours.

E. During REFUELING SHUTDOWN and COLD SHUTDOWN the following valves in the affected unit shall be locked, sealed, or otherwise secured in the closed position except during planned dilution or makeup activities:

1. During Unit 1 REFUELING SHUTDOWN and COLD SHUTDOWN:
   a. Valve 1-CH-223, or
   b. Valves 1-CH-212, 1-CH-215, and 1-CH-218.

2. During Unit 2 REFUELING SHUTDOWN and COLD SHUTDOWN:
   a. Valve 2-CH-223, or
   b. Valves 2-CH-212, 2-CH-215, and 2-CH-218.

3. Following a planned dilution or makeup activities, the valves listed in Specifications 3.2.E.1 and 3.2.E.2 above, for the affected unit, shall be locked, sealed, or otherwise secured in the closed position within 15 minutes.

Basis

The Chemical and Volume Control System provides control of the Reactor Coolant System boron inventory. This is normally accomplished by using boric acid transfer pumps which discharge to the suction of each unit's charging pumps. The Chemical and Volume Control System contains four boric acid transfer pumps. Two of these pumps are normally assigned to each unit but, valving and piping arrangements allow pumps to be shared such that three out of four pumps can service either unit. An alternate (not normally used) method of boration is to use the charging pumps taking suction directly from the refueling water storage tank. There are two sources of borated water available to the suction of the charging pumps through two different paths; one from the refueling water storage tank and one from the discharge of the boric acid transfer pumps.

A. The boric acid transfer pumps can deliver the boric acid tank contents (7.0% solution of boric acid) to the charging pumps.

B. The charging pumps can take suction from the volume control tank, the boric acid transfer pumps and the refueling water storage tank. Reference is made to Technical Specification 3.3.

The quantity of boric acid in storage from either the boric acid tanks or the refueling water storage tank is sufficient to borate the reactor coolant in order to reach COLD SHUTDOWN at any time during core life.

Approximately 6000 gallons of the 7.0% solution of boric acid are required to meet COLD SHUTDOWN conditions. Thus, a minimum of 6000 gallons in the boric acid tank is specified. An upper concentration limit of 8.5% boric acid in the tank is specified to maintain solution solubility at the specified low temperature limit of 112 degrees F.

The Boric Acid Tank(s) are supplied with level alarms which would annunciate if a leak in the system occurred.

For one-unit operation, it is required to maintain available one charging pump with a source of borated water on the opposite unit, the associated piping and valving, and the associated instrumentation and controls in order to maintain the capability to cross-connect the two unit's charging pump discharge headers. In the event the operating unit's charging pumps become inoperable, this permits the opposite unit's charging pump to be used to bring the disabled unit to COLD SHUTDOWN conditions. Initially, the need for the charging pump cross-connect was identified during fire protection reviews.

The requirement that certain valves remain closed during REFUELING SHUTDOWN and COLD SHUTDOWN conditions, except for planned boron dilution or makeup activities, provides assurance that an inadvertent boron dilution will not occur. This specification is not applicable at INTERMEDIATE SHUTDOWN, HOT SHUTDOWN, REACTOR CRITICAL, or POWER OPERATION.

<u>References</u>

UFSAR Sections 9.1 Chemical and Volume Control System

3.3 SAFETY INJECTION SYSTEM

Applicability

Applies to the operating status of the Safety Injection System.

Objective

To define those limiting conditions for operation that are necessary to provide sufficient borated water to remove decay heat from the core in emergency situations.

Specifications

A. A reactor shall not be made critical unless:

1. The refueling water storage tank (RWST) is OPERABLE with:

   a. A contained borated water volume of at least 387,100 gallons.
   b. A boron concentration of at least 2300 ppm but not greater than 2500 ppm.
   c. A maximum solution temperature of 45° F.

2. Each safety injection accumulator is OPERABLE with:

   a. A borated water volume of at least 975 cubic feet but not greater than 1025 cubic feet.
   b. A boron concentration of at least 2250 ppm.
   c. A nitrogen cover-pressure of at least 600 psia.
   d. The safety injection accumulator discharge motor operated valve blocked open by de-energizing AC power and the valves's breaker locked, sealed or otherwise secured in the open position when the reactor coolant system pressure is greater than 1000 psig.

3. Two safety injection subsystems are OPERABLE with subsystems comprised of:

   a. One OPERABLE high head charging pump.
   b. One OPERABLE low head safety injection pump.
   c. An OPERABLE flow path capable of transferring fluid to the Reactor Coolant System when taking suction from the refueling water storage tank on a safety injection signal or from the containment sump when suction is transferred during the recirculation phase of operation.

B. The requirements of Specification 3.3.A may be modified as follows:

1. With the refueling water storage tank inoperable, restore the tank to OPERABLE status within one hour or place the reactor in HOT SHUTDOWN within the next 6 hours.

   a. For conditions where the RWST is inoperable due to boron concentration or solution temperature not being within the limits of Specification 3.3.A.1, restore the parameters to within specified limits in 8 hours or place the reactor in HOT SHUTDOWN within the next 6 hours.

2. With one safety injection accumulator inoperable, restore the accumulator to OPERABLE status within 4 hours or place the reactor in HOT SHUTDOWN within the next 6 hours.

   a. For conditions where one safety injection accumulator is inoperable due to boron concentration not being within the limits of Specification 3.3.A.2, restore the accumulator to within specified limits in 72 hours or place the reactor in HOT SHUTDOWN within the next 6 hours.
   b. Power may be restored to any valve or breaker referenced in Specification 3.3.A.2.d for the purpose of testing or

maintenance provided that not more than one valve has power restored, and the testing and maintenance is completed and power removed within 4 hours.

3. With one safety injection subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or place the reactor in HOT SHUTDOWN within the next 6 hours.

C. If the requirements of Specification 3.3.A are not satisfied as allowed by Specification 3.3.B, the reactor shall be placed in COLD SHUTDOWN in the following 30 hours.

Basis

The normal procedure for starting the reactor is, first, to heat the reactor coolant to near operating temperature by running the reactor coolant pumps. The reactor is then made critical by withdrawing control rods and/or diluting boron in the coolant. With this mode of startup the Safety Injection System is required to be OPERABLE as specified. During LOW POWER PHYSICS TESTS there is a negligible amount of energy stored in the system. Therefore, an accident comparable in severity to the Design Basis Accident is not possible, and the full capacity of the Safety Injection System would not be necessary.

The OPERABLE status of the subsystems is to be demonstrated by periodic tests, detailed in TS Section 4.11. A large fraction of these tests are performed while the reactor is operating in the power range. If a subsystem is found to be inoperable, it will be possible in most cases to effect repairs and restore the subsystem to full operability within a relatively short time. A subsystem being inoperable does not negate the ability of the system to perform its function, but it reduces the redundancy provided in the reactor design and thereby limits the ability to tolerate additional subsystem failures. In some cases, additional components (i.e., charging pumps) are installed to allow a component to be inoperable without affecting system redundancy.

If the inoperable subsystem is not repaired within the specified allowable time period, the reactor will initially be placed in HOT SHUTDOWN to provide for reduction of the decay heat from the fuel, and consequent reduction of cooling requirements after a postulated loss-of-coolant accident. If the malfunction(s) is not corrected the reactor will be placed in COLD SHUTDOWN following normal shutdown and cooldown procedures.

Assuming the reactor has been operating at full RATED POWER for at least 100 days, the magnitude of the decay heat production decreases as follows after a unit trip from full RATED POWER.

Time After Shutdown	Decay Heat, (% of RATED POWER)
1 min.	3.7
30 min.	1.6
1 hour	1.3
8 hours	0.75
48 hours	0.48

Thus, the requirement for core cooling in case of a postulated loss-of-coolant accident, while in HOT SHUTDOWN, is reduced by orders of magnitude below the requirements for handling a postulated loss-of-coolant accident occurring during POWER OPERATION. Placing and maintaining the reactor in HOT SHUTDOWN significantly reduces the potential consequences of a loss-of-coolant accident, allows access to some of the Safety Injection System components in order to effect repairs, and minimizes the plant's exposure to thermal cycling.

Failure to complete repairs within 72 hours is considered indicative of unforeseen problems (i.e., possibly the need of major maintenance). In such a case, the reactor is placed in COLD SHUTDOWN.

The accumulators are able to accept leakage from the Reactor Coolant System without any effect on their operability. Allowable inleakage is based on the volume of water that can be added to the initial amount without exceeding the volume given in Specification 3.3.A.2.

The accumulators (one for each loop) discharge into the cold leg of the reactor coolant piping when Reactor Coolant System pressure decreases below accumulator pressure, thus assuring rapid core cooling for large breaks. The line from each accumulator is provided with a motor-operated valve to isolate the accumulator during reactor start-up and shutdown to preclude the discharge of the contents of the accumulator when not required.

Accumulator Motor Operated Discharge Isolation Valves

Unit No. 1	Unit No. 2
MOV 1865A	MOV 2865A
MOV 1865B	MOV 2865B
MOV 1865C	MOV 2865C

However, to assure that the accumulator valves satisfy the single failure criteria, they will be locked, sealed or otherwise secured open by de-energizing the valve motor operators when the reactor coolant pressure exceeds 1000 psig. The operating pressure of the Reactor Coolant System is 2235* psig and accumulator injection is initiated when this pressure drops to 600 psia. De-energizing the motor operator when the pressure exceeds 1000 psig allows sufficient time during normal startup operation to perform the actions required to de-energize the valve. This procedure will assure that there is an OPERABLE flow path from each accumulator to the Reactor Coolant System during POWER OPERATION and that safety injection can be accomplished.

The removal of power from the valves listed above will assure that the systems of which they are a part satisfy the single failure criterion.

* For Unit 2 Cycle 12, Reactor Coolant System nominal operating pressure may be reduced to 2135 psig.

B. During POWER OPERATION the requirements of Specification 3.4.A may be modified to allow a subsystem or the following components to be inoperable. If the components are not restored to meet the requirements of Specification 3.4.A within the time period specified below, the reactor shall be placed in HOT SHUTDOWN within the next 6 hours. If the requirements of Specification 3.4.A are not satisfied within an additional 48 hours the reactor shall be placed in COLD SHUTDOWN within the following 30 hours.

1. One Containment Spray Subsystem may be inoperable, provided immediate attention is directed to making repairs and the subsystem can be restored to OPERABLE status within 24 hours.

2. One outside Recirculation Spray Subsystem may be inoperable, provided immediate attention is directed to making repairs and the subsystem can be restored to OPERABLE status within 24 hours.

3. One inside Recirculation Spray Subsystem may be inoperable, provided immediate attention is directed to making repairs and the subsystem can be restored to OPERABLE status within 72 hours.

4. Refueling Water Storage Tank volume may be outside the limits of Specification 3.4.A.3 provided it is restored to within limits within one hour.

   a. For conditions where the RWST is inoperable due to boron concentration or solution temperature not being within the limits specified, restore the parameters to within specified limits in 8 hours.

In addition to supplying water to the Containment Spray System, the refueling water storage tank is also a source of water for safety injection following an accident. This water is borated to a concentration which assures reactor shutdown by approximately 5 percent Δk/k when all control rods assemblies are inserted and when the reactor is cooled down for refueling.

<u>References</u>

UFSAR Section 4	Reactor Coolant System
UFSAR Section 6.3.1	Containment Spray Subsystem
UFSAR Section 6.3.1	Recirculation Spray Pumps and Coolers
UFSAR Section 6.3.1	Refueling Water Chemical Addition Tank
UFSAR Section 6.3.1	Refueling Water Storage Tank
UFSAR Section 14.5.2	Design Basis Accident
UFSAR Section 14.5.5	Containment Transient Analysis

ALLOWABLE AIR PARTIAL PRESSURE SURRY POWER STATION UNITS 1 AND 2

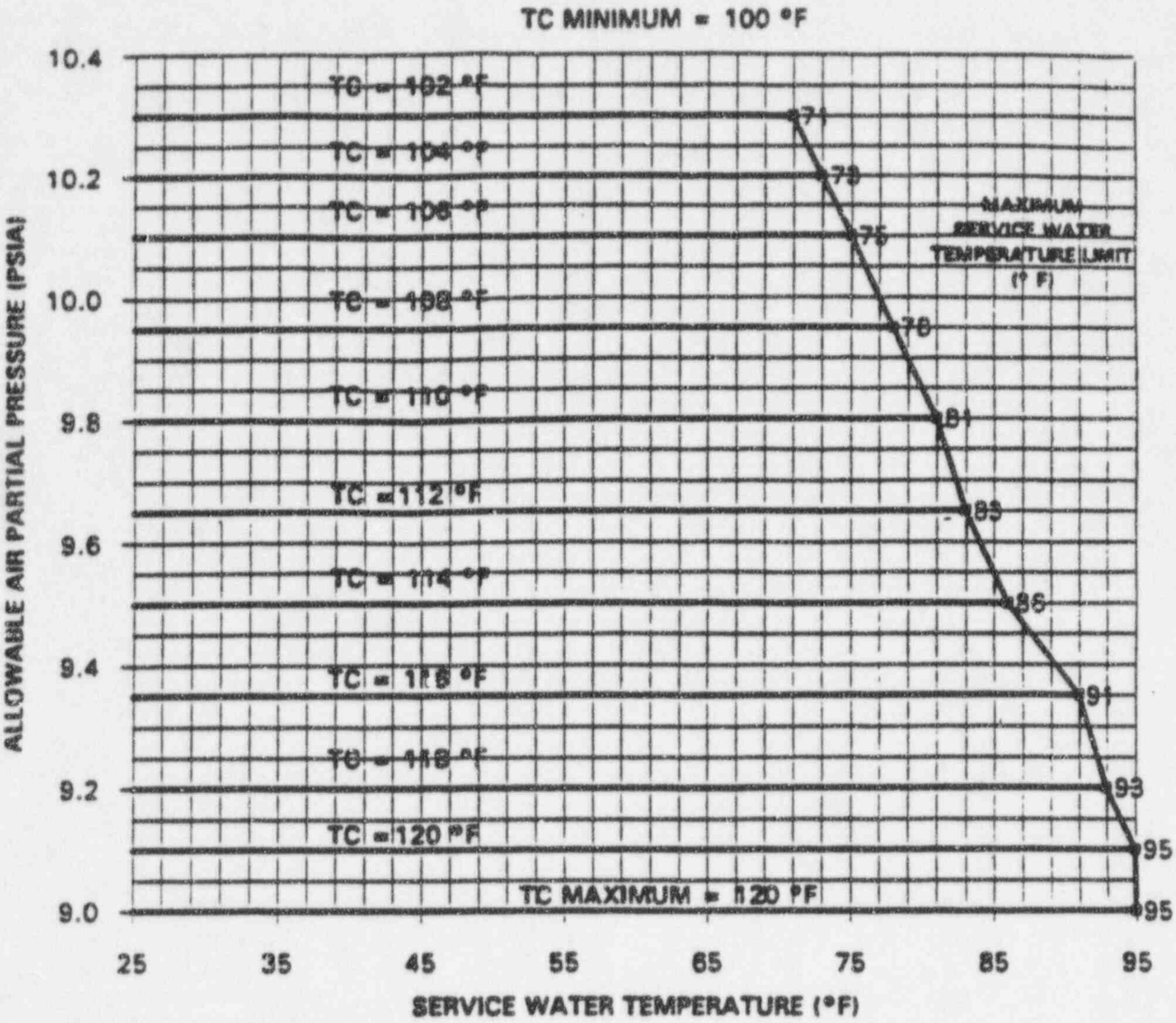

FIGURE NOTATION

TC - Containment average temperature

FIGURE NOTES

1. Refueling Water Storage Tank temperature ≤ 45°F, with an 8 hour AOT.
2. Allowable operating air partial pressure in the containment is a function of service water temperature.
3. Horizontal lines designate allowable air partial pressure per given containment average temperature.
4. Each containment temperature line is a maximum for the given air partial pressure.

3.13 COMPONENT COOLING SYSTEM

Applicability

Applies to the operational status of all subsystems of the Component Cooling System. The Component Cooling System consists of the Component Cooling Water Subsystem, Chilled Component Water Subsystem, Chilled Water Subsystem, and Neutron Shield Tank Cooling Water Subsystem.

Objective

To define limiting conditions for each subsystem of the Component Cooling System necessary to assure safe operation of each reactor unit of the station during startup, POWER OPERATION, or cooldown.

Specifications

A. When a unit's Reactor Coolant System temperature and pressure exceed 350°F and 450 psig, respectively, or when a unit's reactor is critical operating conditions for the Component Cooling Water Subsystem shall be as follows:

1. For one unit operation, two component cooling water pumps and heat exchangers shall be OPERABLE.

2. For two unit operation, three component cooling water pumps and heat exchangers shall be OPERABLE.

3. The Component Cooling Water Subsystem shall be OPERABLE for immediate supply of cooling water to the following components, if required:

   a. Two OPERABLE residual heat removal heat exchangers.

B. During POWER OPERATION, Specification A-1, A-2, or A-3 above may be modified to allow one of the required components to be inoperable provided immediate attention is directed to making repairs. If the system is not restored within 24 hours to the requirements of Specification A-1, A-2, or A-3, an operating reactor shall be placed in HOT SHUTDOWN within the next 6 hours. If the repairs are not completed within an additional 48 hours, the affected reactor shall be placed in COLD SHUTDOWN within the following 30 hours.

C. Whenever the component cooling water radiation monitor is inoperable, the surge tank vent valve shall remain closed.

Basis

The Component Cooling System is an intermediate cooling system which serves both reactor units. It transfers heat from heat exchangers containing reactor coolant, other radioactive liquids, and other fluids to the Service Water System. The Component Cooling System is designed to (1) provide cooling water for the removal of residual and sensible heat from the Reactor Coolant System during shutdown, cooldown, and startup, (2) cool the containment recirculation air coolers and the reactor coolant pump motor coolers, (3) cool the letdown flow in the Chemical and Volume Control System during POWER OPERATION, and during residual heat removal for continued purification, (4) cool the reactor coolant pump seal water return flow, (5) provide cooling water for the neutron shield tank and (6) provide cooling to dissipate heat from other reactor unit components.

The Component Cooling Water Subsystem has four component cooling water pumps and four component cooling water heat exchangers. Each of the component cooling water heat exchangers is designed to remove during normal operation the entire heat load from one unit plus one half of the heat load common to both units. Thus, one component cooling water pump and one component cooling water heat exchanger are required for each unit which is at POWER OPERATION. Two pumps and two heat exchangers are normally operated during the removal of residual and sensible heat from one unit during cooldown. Failure of a single component may extend the time required for cooldown but does not affect the safe operation of the station.

References

UFSAR Section 5.3, Containment Systems
UFSAR Section 9.4, Component Cooling System
UFSAR Section 15.5.1.2, Containment Design Criteria

The diesel generators function as an on-site back-up system to supply the emergency buses. Each emergency bus provides power to the following operating Engineered Safeguards equipment:

A. One containment spray pump

B. One charging pump

C. One low head safety injection pump

D. One recirculation spray pump inside containment

E. One recirculation spray pump outside containment

F. One containment vacuum pump

G. One motor-driven auxiliary steam generator feedwater pump

H. One motor control center for valves, instruments, control air compressor, fuel oil pumps, etc.

I. Control area air conditioning equipment - four air recirculating units, two water chilling units, one service water pump, and two chilled water circulating pumps

J. One charging pump service water pump

TABLE 4.1-1 (Continued)

MINIMUM FREQUENCIES FOR CHECK, CALIBRATIONS, AND TEST OF INSTRUMENT CHANNELS

	Channel Description	Check	Calibrate	Test	Remarks
10.	Rod Position Bank Counters	S(1,2) Q(3)	N.A.	N.A.	1) Each six inches of rod motion when data logger is out of service 2) With analog rod position 3) For the control banks, the bench-board indicators shall be checked against the output of the bank overlap unit
11.	Steam Generator Level	S	R	M	
12.	Charging Flow	N.A.	R	N.A.	
13.	Residual Heat Removal Pump Flow	N.A.	R	N.A.	
14.	Boric Acid Tank Level	*D	R	N.A.	
15.	Recirculation Mode transfer				
	a. Refueling Water Storage Tank Level-Low	S	R	M	
	b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	M	
16.	Volume Control Tank Level	N.A.	R	N.A.	
17.	Reactor Containment Pressure-CLS	*D	R	M(1)	1) Isolation valve signal and spray signal
18.	Boric Acid Control	N.A.	R	N.A.	
19.	Containment Sump Level	N.A.	R	N.A.	
20.	Deleted				
21.	Containment Pressure-Vacuum Pump System	S	R	N.A.	
22.	Steam Line Pressure	S	R	M	

TABLE 4.1-2A

MINIMUM FREQUENCY FOR EQUIPMENT TESTS

	DESCRIPTION	TEST	FREQUENCY	FSAR SECTION REFERENCE
1.	Control Rod Assemblies	Rod drop times of all full length rods at hot conditions	Prior to reactor criticality: a. For all rods following each removal of the reactor vessel head b. For specially affected individual rods following any maintenance on or modification to the control rod drive system which could affect the drop time of those specific rods, and c. Each refueling shutdown.	7
2.	Control Rod Assemblies	Partial movement of all rods	Quarterly	7
3.	Refueling Water Chemical Addition Tank	Functional	Each refueling shutdown	6
4.	Pressurizer Safety Valves	Setpoint	Per TS 4.0.5	4
5.	Main Steam Safety Valves	Setpoint	Per TS 4.0.5	10
6.	Containment Isolation Trip	* Functional	Each refueling shutdown	5
7.	Refueling System Interlocks	* Functional	Prior to refueling	9.12
8.	Service Water System	* Functional	Each refueling shutdown	9.9
9.	Fire Protection Pump and Power Supply	Functional	Monthly	9.10
10.	Primary System Leakage	* Evaluate	Daily	4
11.	Diesel Fuel Supply	* Fuel Inventory	5 days/week	8.5
12.	Deleted			
13.	Main Steam Line Trip Valves	Functional (Full Closure)	Before each startup (TS 4.7) The provisions of Specification 4.0.4 are not applicable.	10

TABLE 4.1-2A (CONTINUED)
MINIMUM FREQUENCY FOR EQUIPMENT TESTS

	DESCRIPTION	TEST	FREQUENCY	UFSAR SECTION REFERENCE
19.	Primar[illegible] System	Functional	1. Periodic leakage testing[a][b] on each valve listed in Specification 3.1.C.7a shall be accomplished prior to entering POWER OPERATION after every time the plant is placed in COLD SHUTDOWN for refueling, after each time the plant is placed in COLD SHUTDOWN for 72 hours if testing has not been accomplished in the preceding 9 months, and prior to returning the valve to service after maintenance, repair or replacement work is performed.	
20.	Containment Purge MOV Leakage	Functional	Semi-Annual (Unit at power or shutdown) if purge valves are operated during interval[c]	
21.	Containment Hydrogen Analyzers	a. CHANNEL FUNCTIONAL TEST b. CHANNEL CALIBRATION 1. Sample gas used: One volume percent (±0.25%) hydrogen, balance nitrogen Four volume percent (±0.25%) hydrogen, balance nitrogen 2. CHANNEL CALIBRATION will include startup and operation of the Heat Tracing System	Once per 92 days Once per 18 months	
22.	RCS Flow	Flow ≥ 273,000 gpm	Once per refueling cycle	14
23.	Delete			

(a) To satisfy ALARA requirements, leakage may be measured indirectly (as from the performance of pressure indicators) if accomplished in accordance with approved procedures and supported by computations showing that the method is capable of demonstrating valve compliance with the leakage criteria.

(b) Minimum differential test pressure shall not be below 150 psid.

(c) Refer to Section 4.4 for acceptance criteria.

* See Specification 4.1.D

TABLE 4.1-2B

MINIMUM FREQUENCIES FOR SAMPLING TESTS

DESCRIPTION	TEST	FREQUENCY	FSAR SECTION REFERENCE
1. Reactor Coolant Liquid Samples	Radio-Chemical Analysis(1)	Monthly(5)	
	Gross Activity(2)	5 days/week(5)	9.1
	Tritium Activity	Weekly(5)	9.1
	*Chemistry (CL, F & O_2)	5 days/week	4
	*Boron Concentration	Twice/week	9.1
	$\bar{E}$ Determination	Semiannually(3)	
	DOSE EQUIVALENT I-131	Once/2 weeks(5)	
	Radio-iodine Analysis (including I-131, I-133 & I-135)	Once/4 hours(6) and (7) below	
2. Refueling Water Storage	Chemistry (Cl & F)	Weekly	6
3. Boric Acid Tanks	*Boron Concentration	Twice/Week	9.1
4. Chemical Additive Tank	NaOH Concentration	Monthly	6
5. Spent Fuel Pit	*Boron Concentration	Monthly	9.5
6. Secondary Coolant	Fifteen minute degassed b and q activity	Once/72 hours	10.3
	DOSE EQUIVALENT I-131	Monthly(4) Semiannually(8)	
7. Stack Gas Iodine and Particulate Samples	*I-131 and particulate radioactive releases	Weekly	

*See Specification 4.1.D

(1) A radiochemical analysis will be made to evaluate the following corrosion products: Cr-51, Fe-59, Mn-54, Co-58, and Co-60.

(2) A gross beta-gamma degassed activity analysis shall consist of the quantitative measurement of the total radioactivity of the primary coolant in units of μCi/cc.

2. By verifying that each motor-operated valve in the recirculation spray flow paths performs satisfactorily when tested in accordance with Specification 4.0.5.

3. At least once per 10 years, coincident with the closest refueling outage, by performing an air or smoke flow test and verifying each spray nozzle is unobstructed.

C. Each weight-loaded check valve in the containment spray and outside containment recirculation spray subsystems shall be demonstrated OPERABLE at least once each refueling period, by cycling the valve one complete cycle of full travel and verifying that each valve opens when the discharge line of the pump is pressurized with air and seats when a vacuum is applied.

D. A visual inspection of the containment sump and the inside containment recirculation spray pump wells and the engineered safeguards suction inlets shall be performed at least once each refueling period and/or after major maintenance activities in the containment. The inspection should verify that the containment sump and pump wells are free of debris that could degrade system operation and that the sump components (i.e., trash racks, screens) are properly installed and show no sign of structural distress or excessive corrosion.

4.11 SAFETY INJECTION SYSTEM TESTS

Applicability

Applies to the operational testing of the Safety Injection System.

Objective

To verify that the Safety Injection System will respond promptly and perform its design functions, if required.

Specifications

A. The refueling water storage tank (RWST) shall be demonstrated OPERABLE:

1. At least once per day by verifying the RWST solution temperature.

2. At least once per week by:

   a. Verifying the RWST contained borated water volume, and

   b. Verifying the RWST boron concentration.

B. Each safety injection accumulator shall be demonstrated OPERABLE:

1. At least once per 12 hours by:

   a. Verifying the contained borated water volume is within specified limits, and

   b. Verifying the nitrogen cover-pressure is within specified limits.

2. At least once per 31 days and within 6 hours after each solution volume increase of greater than or equal to 1% of tank volume by verifying the boron concentration of the accumulator solution.

   a. This surveillance is not required when the volume increase makeup source is the RWST.

C. Each Safety Injection Subsystem shall be demonstrated OPERABLE:

1. By verifying, that on recirculation flow, each low head safety injection pump performs satisfactorily when tested in accordance with Specification 4.0.5.

2. By verifying that each charging pump performs satisfactorily when tested in accordance with Specification 4.0.5.

3. By verifying that each motor-operated valve in the safety injection flow path performs satisfactorily when tested in accordance with Specification 4.0.5.

4. Prior to POWER OPERATION by:

   a. Verifying that the following motor operated valves are blocked open by de-energizing AC power to the valves motor operator and tagging the breaker in the off position:

Unit 1	Unit 2
MOV-1890C	MOV-2890C

   b. Verifying that the following motor operated valves are blocked closed by de-energizing AC power to the valves motor operator and the breaker is locked, sealed or otherwise secured in the off position:

Unit 1	Unit 2
MOV-1869A	MOV-2869A
MOV-1869B	MOV-2869B
MOV-1890A	MOV-2890A
MOV-1890B	MOV-2890B

c. Power may be restored to any valve or breaker referenced in Specifications 4.11.C.4.a and 4.11.C.4.b for the purpose of testing or maintenance provided that not more than one valve has power restored at one time, and the testing and maintenance is completed and power removed within 24 hours.

5. At least once per REFUELING SHUTDOWN by:

a. Verifying that each automatic valve capable of receiving a safety injection signal, actuates to its correct position upon receipt of a safety injection test signal. The charging and low head safety injection pumps may be immobilized for this test.

b. Verifying that each charging pump and safety injection pump circuit breaker actuates to its correct position upon receipt of a safety injection test signal. The charging and low head safety injection pumps may be immobilized for this test.

c. Verifying, by visual inspection, that each low head safety injection pump suction inlet from the containment sump is free of debris that could degrade system operation. Perform each refueling outage and/or after major maintenance activities in the containment.

<u>Basis</u>

Complete system tests cannot be performed when the reactor is operating because a safety injection signal causes containment isolation. The method of assuring operability of these systems is therefore to combine system tests to be performed during refueling shutdowns, with more frequent component tests, which can be performed during reactor operation.

The system tests demonstrate proper automatic operation of the Safety Injection System. A test signal is applied to initiate automatic operation action and verification is made that the components receive the safety injection signal in the proper sequence. The test may be performed with the pumps blocked from starting. The test demonstrates the operation of the valves, pump circuit breakers, and automatic circuitry.

During reactor operation, the instrumentation which is depended on to initiate safety injection is checked periodically, and the initiating circuits are tested in accordance with Specification 4.1. In addition, the active components (pumps and valves) are to be periodically tested to check the operation of the starting circuits and to verify that the pumps are in satisfactory running order. The test interval is determined in accordance with ASME Section XI. The accumulators are a passive safeguard.

References

UFSAR Section 6.2, Safety Injection System