

### 3/4.4 REACTOR COOLANT SYSTEM

#### 3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION

##### STARTUP AND POWER OPERATION

##### LIMITING CONDITION FOR OPERATION

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3.4.1.1 All reactor coolant loops shall be in operation.

APPLICABILITY: MODES 1 and 2.\*


ACTION:

With less than the above required reactor coolant loops in operation, be in at least HOT STANDBY within 6 hours.

##### SURVEILLANCE REQUIREMENTS

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4.4.1.1 The above required reactor coolant loops shall be verified in operation and circulating reactor coolant ~~at least once per 12 hours.~~



at the frequency  
specified in the  
Surveillance  
Frequency Control  
Program

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\*See Special Test Exceptions Specification 3.10.4.



## REACTOR COOLANT SYSTEM

### HOT STANDBY

#### LIMITING CONDITION FOR OPERATION

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3.4.1.2 At least two of the reactor coolant loops listed below shall be OPERABLE with two reactor coolant pumps in operation when the Reactor Trip System breakers are closed or with one reactor coolant pump in operation when the Reactor Trip System breakers are open:

- a. Reactor Coolant Loop A and its associated steam generator and reactor coolant pump.
- b. Reactor Coolant Loop B and its associated steam generator and reactor coolant pump.
- c. Reactor Coolant Loop C and its associated steam generator and reactor coolant pump.

APPLICABILITY: MODE 3.

#### ACTION:

- a. With less than the above required reactor coolant loops OPERABLE, restore the required loops to OPERABLE status within 72 hours or be in HOT SHUTDOWN within the next 12 hours.
- b. With only one reactor coolant loop in operation and the Reactor Trip System breakers in the closed position, within 1 hour open the Reactor Trip System breakers.
- c. With no reactor coolant loop in operation, immediately open the Reactor Trip System breakers, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required reactor coolant loop to operation.

#### SURVEILLANCE REQUIREMENTS

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4.4.1.2.1 At least the above required reactor coolant pumps, if not in operation, shall be determined OPERABLE ~~once per 7 days~~ by verifying correct breaker alignments and indicated power availability.

at the frequency specified in the Surveillance Frequency Control Program

\*All reactor coolant pumps may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration, and (2) core outlet temperature is maintained at least 10°F below saturation temperature.



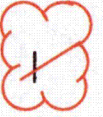
## REACTOR COOLANT SYSTEM

### HOT STANDBY

#### SURVEILLANCE REQUIREMENTS (Continued)

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4.4.1.2.2 The required steam generators shall be determined OPERABLE by verifying narrow range secondary side water level to be greater than or equal to 30% ~~at least once per 12 hours.~~



4.4.1.2.3 The required reactor coolant loops shall be verified in operation and circulating reactor coolant ~~at least once per 12 hours.~~

at the frequency specified in the  
Surveillance Frequency Control  
Program




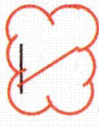
## REACTOR COOLANT SYSTEM


### HOT SHUTDOWN

#### SURVEILLANCE REQUIREMENTS

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4.4.1.3.1 The required reactor coolant pump(s), if not in operation, shall be determined OPERABLE ~~once per 7 days~~ by verifying correct breaker alignments and indicated power availability. 

4.4.1.3.2 The required steam generator(s) shall be determined OPERABLE by verifying wide range (WR) secondary side water level is greater than 74% or narrow range (NR) secondary side water level is greater than 30% ~~at least once per 12 hours~~. 

4.4.1.3.3 At least one reactor coolant or RHR loop shall be verified in operation and circulating reactor coolant ~~at least once per 12 hours~~. 

at the frequency  
specified in the  
Surveillance  
Frequency Control  
Program



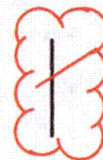
## REACTOR COOLANT SYSTEM

### COLD SHUTDOWN - LOOPS FILLED

#### LIMITING CONDITION FOR OPERATION

3.4.1.4.1 At least one residual heat removal (RHR) loop shall be OPERABLE and in operation\*, and either:

- a. One additional RHR loop shall be OPERABLE\*\*, or
- b. The secondary side water level of at least two steam generators shall be greater than 74% wide range (WR) or greater than 30% narrow range (NR).



APPLICABILITY: MODE 5 with reactor coolant loops filled\*\*\*.

#### ACTION:

- a. With one of the RHR loops inoperable and with less than the required steam generator water level, immediately initiate corrective action to return the inoperable RHR loop to OPERABLE status or restore the required steam generator water level as soon as possible.
- b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

at the frequency specified in the  
Surveillance Frequency Control  
Program

#### SURVEILLANCE REQUIREMENTS

4.4.1.4.1.1 The secondary side water level of at least two steam generators when required shall be determined to be within limits ~~at least once per 12 hours~~.

4.4.1.4.1.2 At least one RHR loop shall be determined to be in operation and circulating reactor coolant ~~at least once per 12 hours~~.

\*The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration, and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

\*\*One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

\*\*\*A reactor coolant pump shall not be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to 325°F unless the secondary water temperature of each steam generator is less than 50°F above each of the Reactor Coolant System cold leg temperatures.



## REACTOR COOLANT SYSTEM

### COLD SHUTDOWN - LOOPS NOT FILLED

#### LIMITING CONDITION FOR OPERATION

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3.4.1.4.2 Two residual heat removal (RHR) loops shall be OPERABLE\* and at least one RHR loop shall be in operation.\*\*

APPLICABILITY: MODE 5 with reactor coolant loops not filled.

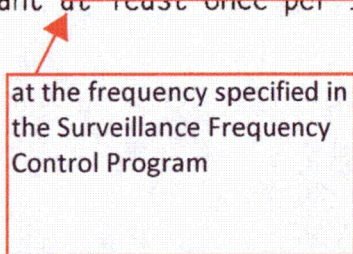
#### ACTION:

- a. With less than the above required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status as soon as possible.
- b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

#### SURVEILLANCE REQUIREMENTS

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4.4.1.4.2 At least one RHR loop shall be determined to be in operation and circulating reactor coolant ~~at least once per 12 hours~~.



at the frequency specified in  
the Surveillance Frequency  
Control Program

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\*One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

\*\*The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration, and (2) core outlet temperature is maintained at least 10°F below saturation temperature.



## REACTOR COOLANT SYSTEM

### 3/4.4.3 PRESSURIZER

#### LIMITING CONDITION FOR OPERATION

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3.4.3 The pressurizer shall be OPERABLE with a water level of less than or equal to 92% of indicated span, and at least two groups of pressurizer heaters each having a capacity of at least 125 kW.

APPLICABILITY: MODES 1, 2, and 3.

#### ACTION:

- a. With only one group of pressurizer heaters OPERABLE, restore at least two groups to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- b. With the pressurizer otherwise inoperable, be in at least HOT STANDBY with the Reactor Trip System breakers open within 6 hours and in HOT SHUTDOWN within the following 6 hours.

#### SURVEILLANCE REQUIREMENTS

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4.4.3.1 The pressurizer water level shall be determined to be within its limit ~~at least once per 12 hours.~~

4.4.3.2 c The capacity of each of the above required groups of pressurizer heaters shall be verified by energizing the heaters and measuring circuit power (kW) ~~at least once per 18 months.~~

at the frequency specified in the  
Surveillance Frequency Control  
Program



## REACTOR COOLANT SYSTEM

### RELIEF VALVES

#### SURVEILLANCE REQUIREMENTS

4.4.4.1 In addition to the requirements of the Inservice Testing Program, each PORV shall be demonstrated OPERABLE ~~at least once per 18 months~~ by:

- a. Performing a CHANNEL CALIBRATION of the actuation instrumentation, and
- b. Operating the valve through one complete cycle of full travel during MODES 3 or 4, prior to going to 325°F.

4.4.4.2 Each block valve shall be demonstrated OPERABLE ~~at least once per 92 days~~ by operating the valve through one complete cycle of full travel unless the block valve is closed with power removed in order to meet the requirements of ACTION b. or c. in Specification 3.4.4.

4.4.4.3 The accumulator for the safety-related PORVs shall be demonstrated OPERABLE ~~at least once per 18 months~~ by isolating the normal air and nitrogen supplies and operating the valves through a complete cycle of full travel.

at the frequency  
specified in the  
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REACTOR COOLANT SYSTEM

REACTOR COOLANT SYSTEM LEAKAGE


LEAKAGE DETECTION SYSTEMS

SURVEILLANCE REQUIREMENTS

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4.4.6.1 The Leakage Detection Systems shall be demonstrated OPERABLE by:

- a. For Containment Airborne Gaseous and Particulate Monitoring Systems, performance of CHANNEL CHECK, CHANNEL CALIBRATION, and DIGITAL CHANNEL OPERATIONAL TEST at the frequencies specified in Table 4.3-3.
- b. For Reactor Cavity Sump Level and Flow Monitoring System, performance of CHANNEL CALIBRATION ~~at least once per 18 months.~~



at the frequency  
specified in the  
Surveillance  
Frequency Control  
Program



## REACTOR COOLANT SYSTEM

### OPERATIONAL LEAKAGE

, at the frequency specified in the Surveillance Frequency Control Program,

### SURVEILLANCE REQUIREMENTS

4.4.6.2.1 Reactor Coolant System operational leakages shall be demonstrated to be within each of the above limits by:

- Monitoring the containment Airborne Gaseous or Particulate Radioactivity Monitor ~~at least once per 12 hours~~;
- Monitoring the containment sump inventory and Flow Monitoring System ~~at least once per 12 hours~~;
- Measurement of the CONTROLLED LEAKAGE to the reactor coolant pump seals when the Reactor Coolant System pressure is  $2235 \pm 20$  psig ~~at least once per 31 days~~ with the modulating valve fully open. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3 or 4;
- Performance of a Reactor Coolant System water inventory balance ~~at least once per 72 hours~~; and
- Monitoring the Reactor Head Flange Leakoff System ~~at least once per 24 hours~~.

4.4.6.2.2 Each Reactor Coolant System Pressure Isolation Valve specified in Table 3.4-1 shall be demonstrated OPERABLE by verifying leakage to be within its limit:

- ~~At least once per 18 months~~.
- Prior to entering MODE 2 whenever the plant has been in COLD SHUTDOWN for 7 days or more and if leakage testing has not been performed in the previous 9 months.
- Prior to returning the valve to service following maintenance, repair or replacement work on the valve, and
- Within 24 hours following valve actuation due to automatic or manual action or flow through the valve.

At the frequency specified in the Surveillance Frequency Control Program

The provisions of Specification 4.0.4 are not applicable for entry into MODE 3 or 4.

at the frequency specified in the Surveillance Frequency Control Program

4.4.6.2.3 Primary-to-secondary leakage shall be verified to be  $\leq 150$  gallons per day through any one steam generator ~~at least once per 72 hours~~.

\*Not required to be performed until 12 hours after establishment of steady-state operation. Not applicable to primary-to-secondary leakage.

\*\*Not required to be performed until 12 hours after establishment of steady-state operation.



## REACTOR COOLANT SYSTEM

No changes on this page.

### 3/4.4.7 CHEMISTRY

#### LIMITING CONDITION FOR OPERATION

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3.4.7 The Reactor Coolant System chemistry shall be maintained within the limits specified in Table 3.4-2.

APPLICABILITY: At all times.

ACTION:

MODES 1, 2, 3, and 4:

- a. With any one or more chemistry parameter in excess of its Steady-State Limit but within its Transient Limit, restore the parameter to within its Steady-State Limit within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; and
- b. With any one or more chemistry parameter in excess of its Transient Limit, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

At All Other Times:

With the concentration of either chloride or fluoride in the Reactor Coolant System in excess of its Steady-State Limit for more than 24 hours or in excess of its Transient Limit, reduce the pressurizer pressure to less than or equal to 500 psig, if applicable, and perform an engineering evaluation to determine the effects of the out-of-limit condition on the structural integrity of the Reactor Coolant System; determine that the Reactor Coolant System remains acceptable for continued operation prior to increasing the pressurizer pressure above 500 psig or prior to proceeding to MODE 4.

#### SURVEILLANCE REQUIREMENTS

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4.4.7 The Reactor Coolant System chemistry shall be determined to be within the limits by analysis of those parameters at the frequencies specified in Table 4.4-3.

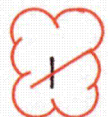


TABLE 4.4-3  
 REACTOR COOLANT SYSTEM  
 CHEMISTRY LIMITS SURVEILLANCE REQUIREMENTS

<u>PARAMETER</u>	<u>SAMPLE AND ANALYSIS FREQUENCY</u>
Dissolved Oxygen*	<del>At least once per 72 hours</del>
Chloride	<del>At least once per 72 hours</del>
Fluoride	<del>At least once per 72 hours</del>

At the frequency  
 specified in the  
 Surveillance  
 Frequency Control  
 Program

\*Not required with  $T_{avg}$  less than or equal to 250°F





## REACTOR COOLANT SYSTEM

No changes on this page.

### 3/4.4.8 SPECIFIC ACTIVITY

#### LIMITING CONDITION FOR OPERATION

3.4.8 The specific activity of the reactor coolant shall be limited to:

- a. Less than or equal to 1 microCurie per gram DOSE EQUIVALENT I-131, and
- b. Less than or equal to 100/£ microCuries per gram of gross radioactivity.

APPLICABILITY: MODES 1, 2, 3, 4, and 5.

#### ACTION:

MODES 1, 2 and 3\*:

- a. With the specific activity of the reactor coolant greater than 1 microCurie per gram DOSE EQUIVALENT I-131 for more than 48 hours during one continuous time interval or exceeding 60.0 microCurie per gram DOSE EQUIVALENT I-131, be in at least HOT STANDBY with  $T_{avg}$  less than 500°F within 6 hours. The provisions of Specification 3.0.4 are not applicable.
- b. With the specific activity of the reactor coolant greater than 100/£ microCuries per gram, be in at least HOT STANDBY with  $T_{avg}$  less than 500°F within 6 hours.

MODES 1, 2, 3, 4, and 5:

With the specific activity of the reactor coolant greater than 1 microcurie per gram DOSE EQUIVALENT I-131 or greater than 100/£ microCuries per gram, perform the sampling and analysis requirements of Item 4.a) of Table 4.4-4 until the specific activity of the reactor coolant is restored to within its limits.

#### SURVEILLANCE REQUIREMENTS

4.4.8 The specific activity of the reactor coolant shall be determined to be within the limits by performance of the sampling and analysis program of Table 4.4-4.

\*With  $T_{avg}$  greater than or equal to 500°F.



TABLE 4.4-4

REACTOR COOLANT SPECIFIC ACTIVITY SAMPLE  
AND ANALYSIS PROGRAM

<u>TYPE OF MEASUREMENT AND ANALYSIS</u>	<div style="border: 1px solid red; padding: 2px;">At the frequency specified in the Surveillance Frequency Control Program</div>	<u>SAMPLE AND ANALYSIS FREQUENCY</u>	<u>MODES IN WHICH SAMPLE AND ANALYSIS REQUIRED</u>
1. Gross Radioactivity Determination		<del>At least once per 72 hours.</del>	1, 2, 3, 4
2. Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration		<del>1 per 14 days.</del>	1
3. Radiochemical for $\bar{E}$ Determination		<del>1 per 6 months**</del>	1
4. Isotopic Analysis for Iodine Including I-131, I-133, and I-135		a. Once per 4 hours, whenever the specific activity exceeds 0.35 $\mu\text{Ci/gram}$ DOSE EQUIVALENT I-131 or 100/ $\bar{E}$ $\mu\text{Ci/gram}$ of gross radioactivity, and  b. One sample between 2 and 6 hours following a THERMAL POWER change exceeding 15% of the RATED THERMAL POWER within a 1-hour period.	1#, 2#, 3#, 4#, 5#
			1, 2, 3





## REACTOR COOLANT SYSTEM

### 3/4.4.9 PRESSURE/TEMPERATURE LIMITS

## REACTOR COOLANT SYSTEM

### LIMITING CONDITION FOR OPERATION

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3.4.9.1 The Reactor Coolant System (except the pressurizer) temperature and pressure shall be limited in accordance with the limit lines shown on Figures 3.4-2 and 3.4-3 during heatup, cooldown, and inservice leak and hydrostatic testing with:

- a. A maximum heatup of 100°F in any 1-hour period.
- b. A maximum cooldown of 100°F in any 1-hour period, and
- c. A maximum temperature change of less than or equal to 10°F in any 1-hour period during inservice hydrostatic and leak testing operations above the heatup and cooldown limit curves.

APPLICABILITY: MODES 1, 2, and 3.

#### ACTION:

With any of the above limits exceeded, restore the temperature and/or pressure to within the limit within 30 minutes; if the pressure and temperature limit lines shown on Figure 3.4-2 and 3.4-3 were exceeded, perform an engineering evaluation to determine the effects of the out-of-limit condition on the structural integrity of the Reactor Coolant System; determine that the Reactor Coolant System remains acceptable for continued operation or be in at least HOT STANDBY within the next 6 hours and reduce the RCS  $T_{avg}$  and pressure to less than 200°F and 500 psig, respectively, within the following 30 hours.

### SURVEILLANCE REQUIREMENTS

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4.4.9.1 The Reactor Coolant System temperature and pressure shall be determined to be within the limits ~~at least once per 30 minutes~~ during system heatup, cooldown, and inservice leak and hydrostatic testing operations.

at the frequency specified in the  
Surveillance Frequency Control  
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## REACTOR COOLANT SYSTEM

### 3/4.4.9 PRESSURE/TEMPERATURE LIMITS



#### LIMITING CONDITION FOR OPERATION

3.4.9.2 The Reactor Coolant System (except the pressurizer) temperature and pressure shall be limited in accordance with the limit lines shown on Figures 3.4-2 and 3.4-3 during heatup, cooldown, and inservice leak and hydrostatic testing with:

- a. A maximum heatup rate as shown on Table 4.4-6.
- b. A maximum cooldown rate as shown on Table 4.4-6.
- c. A maximum temperature change of less than or equal to 10°F in any 1-hour period during inservice hydrostatic and leak testing operations above the heatup and cooldown limit curves.

APPLICABILITY: MODES 4, 5, and 6 with reactor vessel head on.

#### ACTION:

With any of the pressure limits exceeded, restore the temperature and/or pressure to within the limit within 30 minutes; if the pressure and temperature limit lines shown on Figure 3.4-2 and 3.4-3 were exceeded, perform an engineering evaluation to determine the effects of the out-of-limit condition on the structural integrity of the Reactor Coolant System; determine that the Reactor Coolant System remains acceptable for continued operation or maintain the RCS  $T_{avg}$  and pressure at less than 200°F and 500 psig, respectively.

#### SURVEILLANCE REQUIREMENTS

4.4.9.2.1 The Reactor Coolant System temperature and pressure shall be determined to be within the limits ~~at least once per 30 minutes~~ during system heatup, cooldown, and inservice leak and hydrostatic testing operations.

4.4.9.2.2 Deleted from Technical Specifications. Refer to the Technical Specification Equipment List Program, plant procedure PLP-106.

at the frequency  
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REACTOR COOLANT SYSTEM

OVERPRESSURE PROTECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

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3.4.9.4 At least one of the following Overpressure Protection Systems shall be OPERABLE:

- a. The Reactor Coolant System (RCS) depressurized with an RCS vent of greater than or equal to 2.9 square inches, or
- \* b. Two power-operated relief valves (PORVs) with setpoints which do not exceed the limits established in Figure 3.4-4.

APPLICABILITY: MODE 4 when the temperature of any RCS cold leg is less than or equal to 325°F, MODE 5 and MODE 6 with the reactor vessel head on.

ACTION:

- a. With one PORV inoperable in MODE 4, restore the inoperable PORV to OPERABLE status within 7 days or depressurize and vent the RCS through at least a 2.9 square inch vent within the next 8 hours.
- b. With one PORV inoperable in MODES 5 or 6, either (1) restore the inoperable PORV to OPERABLE status within 24 hours, or (2) complete depressurization and venting of the RCS through at least a 2.9 square inch vent within the next 8 hours.
- c. With both PORVs inoperable, depressurize and vent the RCS through at least a 2.9 square inch vent within 8 hours.
- d. In the event either the PORVs or the RCS vent(s) are used to mitigate an RCS pressure transient, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 30 days. The report shall describe the circumstances initiating the transient, the effect of the PORVs or RCS vent(s) on the transient, and any corrective action necessary to prevent recurrence.
- e. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

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4.4.9.4.1 Each PORV shall be demonstrated OPERABLE by:

- a. Performance of an ANALOG CHANNEL OPERATIONAL TEST on the PORV actuation channel, but excluding valve operation, within 31 days prior to

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\* Credit may only be taken for the setpoints when the RCS cold leg temperature  $\geq 90^{\circ}\text{F}$ .



REACTOR COOLANT SYSTEM

OVERPRESSURE PROTECTION SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- entering a condition in which the PORV is required OPERABLE and ~~at least once per 31 days thereafter~~ when the PORV is required OPERABLE;
- b. Performance of a CHANNEL CALIBRATION on the PORV actuation channel ~~at least once per 18 months~~; and
- c. Verifying the PORV isolation valve is open ~~at least once per 72 hours~~ when the PORV is being used for overpressure protection.
- 4.4.9.4.2 The RCS vent(s) shall be verified to be open ~~at least once per 12 hours~~\* when the vent(s) is being used for overpressure protection.

at the frequency  
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at the frequency specified in the  
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Program

\* Except when the vent pathway is provided with a valve which is locked, sealed, or otherwise secured in the open position, then verify these valves open ~~at least once per 31 days~~.



## REACTOR COOLANT SYSTEM

### 3/4.4.11 REACTOR COOLANT SYSTEM VENTS

#### LIMITING CONDITION FOR OPERATION

3.4.11 At least one Reactor Coolant System vent path consisting of at least one vent valve and one block valve, powered from emergency buses, shall be OPERABLE and closed at each of the following locations:

- a. Reactor vessel head, and
- b. Pressurizer steam space

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTION:

- a. With one of the above Reactor Coolant System vent paths inoperable, STARTUP and/or POWER OPERATION may continue provided the inoperable vent path is maintained closed with power removed from the valve actuators of all the vent valves in the inoperable vent path and both block valves; restore the inoperable vent path to OPERABLE status within 30 days or be in HOT STANDBY within 6 hours and in COLD SHUT-DOWN within the following 30 hours.
- b. With both Reactor Coolant System vent paths inoperable, due to causes other than the removal of power to both block valves pursuant to Action a, maintain the inoperable vent path closed with power removed from the valve actuators of all the vent valves and block valves in the inoperable vent paths, and restore at least one of the vent paths to OPERABLE status within 72 hours or be in HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

4.4.11.1 (Section deleted)

4.4.11.2 Each Reactor Coolant System vent path shall be demonstrated OPERABLE ~~at least once per 18 months~~ by:

- a. Verifying all manual isolation valves in each vent path are locked in the open position,
- b. Cycling each valve in the vent path through at least one complete cycle of full travel from the control room, and
- c. Verifying flow through the Reactor Coolant System vent paths during venting.

at the frequency specified in the  
Surveillance Frequency Control  
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### 3/4.5 EMERGENCY CORE COOLING SYSTEMS

#### 3/4.5.1 ACCUMULATORS

##### COLD LEG INJECTION



#### LIMITING CONDITION FOR OPERATION

3.5.1 Each Reactor Coolant System (RCS) accumulator shall be OPERABLE with:

- a. The isolation valve open with power supply circuit breaker open,
- b. A contained borated water volume of between 66 and 96% indicated level,
- c. A boron concentration of between 2400 and 2600 ppm, and
- d. A nitrogen cover-pressure of between 585 and 665 psig.

APPLICABILITY: MODES 1, 2, and 3\*.

#### ACTION:


- a. With one accumulator inoperable, except as a result of a closed isolation valve or boron concentration not within limits, restore the inoperable accumulator to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to less than 1000 psig within the following 6 hours. 
- b. With one accumulator inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in at least HOT STANDBY within 6 hours and reduce pressurizer pressure to less than 1000 psig within the following 6 hours.
- c. With one accumulator inoperable due to boron concentration not within limits, restore the boron concentration within limits within 72 hours or be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to less than 1000 psig within the following 6 hours. 

#### SURVEILLANCE REQUIREMENTS

4.5.1.1 Each accumulator shall be demonstrated OPERABLE:

- a. ~~At least once per 12 hours~~ by:

At the frequency specified in the Surveillance Frequency Control Program

1. Verifying that the contained borated water volume and nitrogen cover-pressure in the tanks are within their limits, and
  2. Verifying that each accumulator isolation valve is open.
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\*RCS pressure above 1000 psig.



## EMERGENCY CORE COOLING SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- b. ~~At least once per 31 days~~ and within 6 hours after each solution volume increase of greater than or equal to 76 gallons, which is equivalent to an indicated level change of 9%, by verifying the boron concentration of the accumulator solution#; and
- c. ~~At least once per 31 days~~ when the RCS pressure is above 1000 psig by verifying that the circuit breaker supplying power to the respective isolation valve operator is open.

At the frequency specified in the Surveillance Frequency Control Program

# This surveillance is not required when the volume increase makeup source is the Refueling Water Storage Tank (RWST) and the RWST has not been diluted since verifying that the RWST boron concentration is equal to or greater than the accumulator boron concentration limit.



## EMERGENCY CORE COOLING SYSTEMS

### 3/4.5.2 ECCS SUBSYSTEMS - $T_{avg}$ GREATER THAN OR EQUAL TO 350°F

#### LIMITING CONDITION FOR OPERATION

3.5.2 Two independent Emergency Core Cooling System (ECCS) subsystems shall be OPERABLE with each subsystem comprised of:

- a. One OPERABLE Charging/safety injection pump,
- b. One OPERABLE RHR heat exchanger,
- c. One OPERABLE RHR pump, and
- d. An OPERABLE flow path capable of taking suction from the refueling water storage tank on a Safety Injection signal and, upon being manually aligned, transferring suction to the containment sump during the recirculation phase of operation.

APPLICABILITY: MODES 1, 2, and 3.

#### ACTION:

- a. With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- b. In the event the ECCS is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date. The current value of the usage factor for each affected Safety Injection nozzle shall be provided in this Special Report whenever its value exceeds 0.70.

#### SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

- a. ~~At least once per 12 hours~~ by:

1. Verifying that the following valves are in the indicated positions with the control power disconnect switch in the "OFF" position, and the valve control switch in the "PULL TO LOCK" position:

At the frequency specified in the Surveillance Frequency Control Program





## EMERGENCY CORE COOLING SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

<u>CP&amp;L Valve No.</u>	<u>EBASCO Valve No..</u>	<u>Valve Function</u>	<u>Valve Position</u>
ISI-107	2SI-V500SA-1	High Head Safety Injection to Reactor Coolant System Hot Legs	Closed
ISI-86	2SI-V501SB-1	High Head Safety Injection to Reactor Coolant System Hot Legs	Closed
ISI-52	2SI-V502SA-1	High Head Safety Injection to Reactor Coolant System Cold Legs	Closed
ISI-340	2SI-V579SA-1	Low Head Safety Injection to Reactor Coolant System Cold Legs	Open
ISI-341	2SI-V578SB-1	Low Head Safety Injection to Reactor Coolant System Cold Legs	Open
ISI-359	2SI-V587SA-1	Low Head Safety Injection to Reactor Coolant System Hot Legs	Closed

b. ~~At least once per 31 days~~ by:

At the frequency  
specified in the  
Surveillance  
Frequency Control  
Program

1. Verifying that the ECCS piping is full of water by venting accessible discharge piping high points, and
2. Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

c. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the containment sump and cause restriction of the pump suction during LOCA conditions. This visual inspection shall be performed:

1. For all accessible areas of the containment prior to establishing CONTAINMENT INTEGRITY, and
2. Of the areas affected within containment at the completion of each containment entry when CONTAINMENT INTEGRITY is established.



## EMERGENCY CORE COOLING SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

At the frequency specified in the Surveillance Frequency Control Program

d. ~~At least once per 18 months~~ by:

1. Verifying automatic interlock action of the RHR system from the Reactor Coolant System by ensuring that with a simulated or actual Reactor Coolant System pressure signal greater than or equal to 425 psig the interlocks prevent the valves from being opened.
2. A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or abnormal corrosion.

e. ~~At least once per 18 months~~ by:

1. Verifying that each automatic valve in the flow path actuates to its correct position on safety injection actuation test signal and on safety injection switchover to containment sump from an RWST Lo-Lo level test signal, and
2. Verifying that each of the following pumps start automatically upon receipt of a safety injection actuation test signal:
  - a) Charging/safety injection pump.
  - b) RHR pump.

f. By verifying that each of the following pumps develops the required differential pressure when tested pursuant to the Inservice Testing Program:

1. Charging/safety injection pump (Refer to Specification 4.1.2.4)
2. RHR pump  $\geq 100$  psid at a flow rate of at least 3663 gpm.

g. By verifying that the locking mechanism is in place and locked for the following High Head ECCS throttle valves:

1. Within 4 hours following completion of each valve stroking operation or maintenance on the valve when the ECCS subsystems are required to be OPERABLE, and
2. ~~At least once per 18 months.~~

At the frequency specified in the Surveillance Frequency Control Program



## EMERGENCY CORE COOLING SYSTEMS

### 3/4.5.4 REFUELING WATER STORAGE TANK

#### LIMITING CONDITION FOR OPERATION

3.5.4 The refueling water storage tank (RWST) shall be OPERABLE with:

- A minimum contained borated water volume of 436,000 gallons, which is equivalent to 92% indicated level.
- A boron concentration of between 2400 and 2600 ppm of boron.
- A minimum solution temperature of 40°F, and
- A maximum solution temperature of 125°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTION:

With the RWST inoperable, restore the tank to OPERABLE status within 1 hour\* or be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

4.5.4 The RWST shall be demonstrated OPERABLE:

a. ~~At least once per 7 days~~ by:

- Verifying the contained borated water volume in the tank, and
- Verifying the boron concentration of the water.

At the frequency specified in the Surveillance Frequency Control Program

b. ~~At least once per 24 hours~~ by verifying the RWST temperature when the outside air temperature is less than 40°F or greater than 125°F.

\*

Except that while performing surveillance 4.4.6.2.2, the tank must be returned to OPERABLE status within 12 hours.



### 3/4.6 CONTAINMENT SYSTEMS

#### 3/4.6.1 PRIMARY CONTAINMENT

##### CONTAINMENT INTEGRITY

##### LIMITING CONDITION FOR OPERATION

3.6.1.1 Primary CONTAINMENT INTEGRITY shall be maintained.

APPLICABILITY: MODES 1, 2, 3, and 4.

##### ACTION:

Without primary CONTAINMENT INTEGRITY, restore CONTAINMENT INTEGRITY within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

##### SURVEILLANCE REQUIREMENTS

4.6.1.1 Primary CONTAINMENT INTEGRITY shall be demonstrated:

- a. ~~At least once per 31 days~~ by verifying that all penetrations\* not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed by valves, blind flanges, or deactivated automatic valves secured in their closed positions, except as provided in Table 3.6-1 of Specification 3.6.3;
- b. By verifying that each containment air lock is in compliance with the requirements of Specification 3.6.1.3; and
- c. After each closing of each penetration subject to Type B testing, except the containment air locks, if opened following a Type A or B test, by leak rate testing the seal with gas at a pressure not less than  $P_a$ , and verifying that when the measured leakage rate for these seals is added to the leakage rates determined pursuant to Specification 4.6.1.2a, for all other Type B and C penetrations, the combined leakage rate is less than  $0.60 L_a$ .

At the  
frequency  
specified in  
the  
Surveillance  
Frequency  
Control  
Program

\* Except valves, blind flanges, and deactivated automatic valves which are located inside the containment and are locked, sealed or otherwise secured in the closed position. These penetrations shall be verified closed during each COLD SHUTDOWN except that such verification need not be performed more often than once per 92 days.

# Valves CP-B3, CP-B7, and CM-B5 may be verified ~~at least once per 31 days~~ by manual remote keylock switch position.

at the frequency specified in the  
Surveillance Frequency Control  
Program



## CONTAINMENT SYSTEMS

### CONTAINMENT AIR LOCKS

#### SURVEILLANCE REQUIREMENTS

---

4.6.1.3 Each containment air lock shall be demonstrated OPERABLE by:

- a. Performing required air lock leakage rate testing in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions###. The acceptance criteria for air lock testing are:
  - 1. Overall air lock leakage rate is  $\leq .05 L_a$  when tested at  $\geq P_a$ .
  - 2. For each door, leakage rate is  $\leq .01 L_a$  when tested at  $\geq P_a$ .
- b. ~~At least once per 6 months~~ by verifying that only one door in the air lock can be opened at a time\*\*.

At the frequency specified  
in the Surveillance  
Frequency Control  
Program

the interval specified by  
the Surveillance  
Frequency Control  
Program

- ### 1. An inoperable air lock door does not invalidate the previous successful performance of the overall airlock leakage test.
- 2. Results shall be evaluated against Specification 3.6.1.2.a in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions.

\*\* Only required to be performed upon entry or exit through the containment air lock. (If Surveillance Requirement 4.6.1.3.b has not been performed in ~~the last 6 months~~, then perform Surveillance Requirement 4.6.1.3.b during the next containment entry through the associated air lock.)



## CONTAINMENT SYSTEMS

### INTERNAL PRESSURE

#### LIMITING CONDITION FOR OPERATION

---

3.6.1.4 Primary containment internal pressure shall be maintained between -1.0 inches water gauge and 1.6 psig.

APPLICABILITY: MODES 1, 2, 3, and 4.


#### ACTION:

With the containment internal pressure outside of the limits above, restore the internal pressure to within the limits within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

---

4.6.1.4 The primary containment internal pressure shall be determined to be within the limits ~~at least once per 12 hours~~.



at the frequency specified in  
the Surveillance Frequency  
Control Program



## CONTAINMENT SYSTEMS

### AIR TEMPERATURE

#### LIMITING CONDITION FOR OPERATION

3.6.1.5 Primary containment average air temperature shall not exceed 120°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTION:

With the containment average air temperature greater than 120°F, reduce the average air temperature to within the limit within 8 hours, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

4.6.1.5 The primary containment average air temperature shall be the arithmetical average of the temperatures at the following locations and shall be determined ~~at least once per 24 hours~~, to be within the limit:

##### Location

- a. Elevation 290 ft
- b. Elevation 240 ft
- c. Elevation 230 ft

at the frequency specified in  
the Surveillance Frequency  
Control Program



## CONTAINMENT SYSTEMS

### CONTAINMENT VENTILATION SYSTEM

#### SURVEILLANCE REQUIREMENTS

4.6.1.7.1 Each 42-inch containment preentry purge makeup and exhaust isolation valve shall be verified to be sealed closed and closed ~~at least once per 31 days.~~

4.6.1.7.2 ~~At least once per 3 months on a STAGGERED TEST BASIS,~~ the inboard and outboard valves in each makeup and exhaust penetration (2-42 inch valves and 2-8 inch valves) shall be demonstrated OPERABLE by verifying that the measured penetration leakage rate is less than  $0.06 L_a$  when pressurized to  $P_a$ .

at the frequency specified in the  
Surveillance Frequency Control  
Program



## CONTAINMENT SYSTEMS

### 3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

#### CONTAINMENT SPRAY SYSTEM

##### LIMITING CONDITION FOR OPERATION

3.6.2.1 Two independent Containment Spray Systems shall be OPERABLE with each Spray System capable of taking suction from the RWST and transferring suction to the containment sump.

APPLICABILITY: MODES 1, 2, 3, and 4.

##### ACTION:

With one Containment Spray System inoperable, restore the inoperable Spray System to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the inoperable Spray System to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the following 30 hours. Refer also to Specification 3.6.2.3 Action.

##### SURVEILLANCE REQUIREMENTS

4.6.2.1 Each Containment Spray System shall be demonstrated OPERABLE:

- a. ~~At least once per 31 days~~ by verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position;
- b. By verifying that, on an indicated recirculation flow of at least 1832 gpm, each pump develops a differential pressure of greater than or equal to 186 psi when tested pursuant to the Inservice Testing Program;
- c. ~~At least once per 18 months~~ by:
  - 1. Verifying that each automatic valve in the flow path actuates to its correct position on a containment spray actuation test signal and
  - 2. Verifying that each spray pump starts automatically on a containment spray actuation test signal.
  - 3. Verifying that, coincident with an indication of containment spray pump running, each automatic valve from the sump and RWST actuates to its appropriate position following an RWST Lo-Lo test signal.
- d. ~~At least once per 10 years~~ by performing an air or smoke flow test through each spray header and verifying each spray nozzle is unobstructed.

At the frequency specified  
in the Surveillance  
Frequency Control Program



## CONTAINMENT SYSTEMS

### SPRAY ADDITIVE SYSTEM

#### LIMITING CONDITION FOR OPERATION

3.6.2.2 The Spray Additive System shall be OPERABLE with:

- a. A Spray Additive Tank containing a volume of between 3268 and 3768 gallons of between 27 and 29 weight % NaOH solution, and
- b. Two spray additive eductors each capable of adding NaOH solution from the chemical additive tank to a Containment Spray System pump flow.

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTION:

With the Spray Additive System inoperable, restore the system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the Spray Additive System to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

4.6.2.2 The Spray Additive System shall be demonstrated OPERABLE:

- a. ~~At least once per 31 days~~ by verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position;
- b. ~~At least once per 6 months~~ by:
  1. Verifying the contained solution volume in the tank, and
  2. Verifying the concentration of the NaOH solution by chemical analysis.
- c. ~~At least once per 18 months~~ by verifying that each automatic valve in the flow path actuates to its correct position on a containment spray or containment isolation phase A test signal as applicable; and
- d. ~~At least once per 5 years~~ by verifying each eductor flow rate is between 17.2 and 22.2 gpm, using the RWST as the test source containing at least 436,000 gallons of water.

At the frequency specified in the Surveillance Frequency Control Program



## CONTAINMENT SYSTEMS

### CONTAINMENT COOLING SYSTEM

#### LIMITING CONDITION FOR OPERATION

3.6.2.3 Four containment fan coolers (AH-1, AH-2, AH-3, and AH-4) shall be OPERABLE with one of two fans in each cooler capable of operation at low speed. Train SA consists of AH-2 and AH-3. Train SB consists of AH-1 and AH-4.

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTION:

- a. With one train of the above required containment fan coolers inoperable and both Containment Spray Systems OPERABLE, restore the inoperable train of fan coolers to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With both trains of the above required containment fan coolers inoperable and both Containment Spray Systems OPERABLE, restore at least one train of fan coolers to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore both above required trains of fan coolers to OPERABLE status within 7 days of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With one train of the above required containment fan coolers inoperable and one Containment Spray System inoperable, restore the inoperable Spray System to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore the inoperable train of containment fan coolers to OPERABLE status within 7 days of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

4.6.2.3 Each train of containment fan coolers shall be demonstrated OPERABLE:

- a. ~~At least once per 31 days by:~~
  1. Starting each fan train from the control room, and verifying that each fan train operates for at least 15 minutes, and
  2. Verifying a cooling water flow rate, after correction to design basis service water conditions, of greater than or equal to 1300 gpm to each cooler.
- b. ~~At least once per 18 months~~ by verifying that each fan train starts automatically on a safety injection test signal.

At the frequency specified in the Surveillance Frequency Control Program






## CONTAINMENT SYSTEMS

### CONTAINMENT ISOLATION VALVES

#### SURVEILLANCE REQUIREMENTS (Continued)

at the frequency  
specified in the  
Surveillance Frequency  
Control Program



4.6.3.2 Each isolation valve shall be demonstrated OPERABLE ~~at least once per 18 months~~ by:

- a. Verifying that on a Phase "A" Isolation test signal, each Phase "A" isolation valve actuates to its isolation position;
- b. Verifying that on a Phase "B" Isolation test signal, each Phase "B" isolation valve actuates to its isolation position; and
- c. Verifying that on a Containment Ventilation Isolation test signal, each normal, preentry purge makeup and exhaust, and containment vacuum relief valve actuates to its isolation position, and
- d. Verifying that, on a Safety Injection "S" test signal, each containment isolation valve receiving an "S" signal actuates to its isolation position, and
- e. Verifying that, on a Main Steam Isolation test signal, each main steam isolation valve actuates to its isolation position, and
- f. Verifying that, on a Main Feedwater Isolation test signal, each feedwater isolation valve actuates to its isolation position.

4.6.3.3 The isolation time of each power-operated or automatic valve shall be determined to be within its limit specified in the Technical Specification Equipment List Program, plant procedure PLP-106, when tested pursuant to the Inservice Testing Program.





## PLANT SYSTEMS

### AUXILIARY FEEDWATER SYSTEM

#### LIMITING CONDITION FOR OPERATION

---

3.7.1.2 At least three independent steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE with:

- a. Two motor-driven auxiliary feedwater pumps, each capable of being powered from separate emergency buses, and
- b. One steam turbine-driven auxiliary feedwater pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2, and 3.

#### ACTION:

- a. With one auxiliary feedwater pump inoperable, restore the required auxiliary feedwater pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- b. With two auxiliary feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.
- c. With three auxiliary feedwater pumps inoperable, immediately initiate corrective action to restore at least one auxiliary feedwater pump to OPERABLE status as soon as possible. (NOTE: LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status. Following restoration of one AFW train, all applicable LCOs apply based on the time the LCOs initially occurred.)

#### SURVEILLANCE REQUIREMENTS

---

4.7.1.2.1 Each auxiliary feedwater pump shall be demonstrated OPERABLE:

- a. ~~At least once per 92 days on a STAGGERED TEST BASIS~~ by:

At the frequency  
specified in the  
Surveillance Frequency  
Control Program

1. Demonstrating that each motor-driven pump satisfies performance requirements by either:
  - a) Verifying each pump develops a differential pressure that (when temperature - compensated to 70°F) is greater than or equal to 1514 psid at a recirculation flow of greater than or equal to 50 gpm (25 KPPH), or
  - b) Verifying each pump develops a differential pressure that (when temperature - compensated to 70°F) is greater than or equal to 1259 psid at a flow rate of greater than or equal to 430 gpm (215 KPPH).



## PLANT SYSTEMS

### AUXILIARY FEEDWATER SYSTEM

#### SURVEILLANCE REQUIREMENTS (Continued)

2. Demonstrating that the steam turbine - driven pump satisfies performance requirements by either:

\*\*\*\*\*

NOTE: The provisions of Specification 4.0.4 are not applicable for entry into MODE 3.

\*\*\*\*\*

- a) Verifying the pump develops a differential pressure that (when temperature - compensated to 70°F) is greater than or equal to 1167 psid at a recirculation flow of greater than or equal to 81 gpm (40.5 KPPH) when the secondary steam supply pressure is greater than 210 psig, or
- b) Verifying the pump develops a differential pressure that (when temperature - compensated to 70°F) is greater than or equal to 1400 psid at a flow rate of greater than or equal to 430 gpm (215 KPPH) when the secondary steam supply pressure is greater than 280 psig.

- b. ~~At least once per 31 days~~ by:

1. Verifying by flow or position check that each valve (manual, power operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position is in its correct position; and
2. Verifying that the isolation valves in the suction line from the CST are locked open.

At the frequency specified in the Surveillance Frequency Control Program

- c. ~~At least once per 18 months~~ by:

1. Verifying that each motor-driven auxiliary feedwater pump starts automatically, as designed, upon receipt of a test signal and that the respective pressure control valve for each motor-driven pump and each flow control valve with an auto-open feature respond as required;
2. Verifying that the turbine-driven auxiliary feedwater pump starts automatically, as designed, upon receipt of a test signal. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3; and
3. Verifying that the motor-operated auxiliary feedwater isolation valves and flow control valves close as required upon receipt of an appropriate test signal for steamline differential pressure high coincident with main steam isolation.



## PLANT SYSTEMS

### CONDENSATE STORAGE TANK

#### LIMITING CONDITION FOR OPERATION

3.7.1.3 The condensate storage tank (CST) shall be OPERABLE with a contained water volume of at least 270,000 gallons of water, which is equivalent to 62% indicated level.

APPLICABILITY: MODES 1, 2, and 3.

#### ACTION:

With the CST inoperable, within 4 hours either:

- a. Restore the CST to OPERABLE status or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours, or
- b. Demonstrate the OPERABILITY of the Emergency Service Water System as a backup supply to the auxiliary feedwater pumps and restore the CST to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

#### SURVEILLANCE REQUIREMENTS

4.7.1.3.1 The CST shall be demonstrated OPERABLE ~~at least once per 12 hours~~ by verifying the contained water volume is within its limits when the tank is the supply source for the auxiliary feedwater pumps.

4.7.1.3.2 The Emergency Service Water System shall be demonstrated OPERABLE ~~at least once per 12 hours~~ by verifying that each valve, required to permit the Emergency Service Water System to supply water to the auxiliary feedwater pumps, is open whenever the Emergency Service Water System is the supply source for the auxiliary feedwater pumps.

at the frequency specified in the Surveillance  
Frequency Control Program



PLANT SYSTEMS

SPECIFIC ACTIVITY

No changes on this page.

LIMITING CONDITION FOR OPERATION

3.7.1.4 The specific activity of the Secondary Coolant System shall be less than or equal to 0.1 microCurie/gram DOSE EQUIVALENT I-131.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

With the specific activity of the Secondary Coolant System greater than 0.1 microCurie/gram DOSE EQUIVALENT I-131, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.1.4 The specific activity of the Secondary Coolant System shall be determined to be within the limit by performance of the sampling and analysis program of Table 4.7-1.



TABLE 4.7-1

SECONDARY COOLANT SYSTEM SPECIFIC ACTIVITY SAMPLE AND ANALYSIS PROGRAM

<u>TYPE OF MEASUREMENT AND ANALYSIS</u>	<u>SAMPLE AND ANALYSIS FREQUENCY</u>
1. Gross Radioactivity Determination* or Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	<del>At least once per 72 hours.</del>
2. Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	<p>a. Once per 31 days, when- ever the gross radio- activity determination * indicates concentrations greater than 10% of the allowable limit for radioiodines.</p> <p>b. <del>Once per 6 months,</del> when- ever the gross radio- activity determination indicates concentrations less than or equal to 10% of the allowable limit for radioiodines.</p>

At the frequency specified in the  
Surveillance Frequency Control  
Program

\*A gross radioactivity analysis shall consist of the quantitative measurement of the total specific activity of the secondary coolant except for radio-nuclides with half-lives less than 15 minutes. Determination of the contributors to the gross specific activity shall be based upon those energy peaks identifiable with a 95% confidence level.



## PLANT SYSTEMS

### 3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

#### LIMITING CONDITION FOR OPERATION

3.7.2 The temperatures of both the reactor and secondary coolants in the steam generators shall be greater than 70°F when the pressure of either coolant in the steam generator is greater than 200 psig.

APPLICABILITY: At all times.

#### ACTION:

With the requirements of the above specification not satisfied:

- a. Reduce the steam generator pressure of the applicable side to less than or equal to 200 psig within 30 minutes, and
- b. Perform an engineering evaluation to determine the effect of the overpressurization on the structural integrity of the steam generator. Determine that the steam generator remains acceptable for continued operation prior to increasing its temperatures above 200°F.

#### SURVEILLANCE REQUIREMENTS

4.7.2 The pressure in each side of the steam generator shall be determined to be less than 200 psig ~~at least once per hour~~ when the temperature of either the reactor or secondary coolant is less than 70°F.

At the frequency specified in the Surveillance Frequency Control Program



## PLANT SYSTEMS

### 3/4.7.3 COMPONENT COOLING WATER SYSTEM

#### LIMITING CONDITION FOR OPERATION

3.7.3 At least two component cooling water (CCW) pumps\*, heat exchangers and essential flow paths shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTION:

With only one component cooling water flow path OPERABLE, restore at least two flow paths to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

4.7.3 At least two component cooling water flow paths shall be demonstrated OPERABLE:

- a. ~~At least once per 31 days~~ by verifying that each valve (manual, power-operated, or automatic) servicing safety-related equipment that is not locked, sealed, or otherwise secured in position is in its correct position; and
- b. ~~At least once per 18 months~~ by verifying that:
  - 1. Each automatic valve servicing safety-related equipment or isolating non-safety-related components actuates to its correct position on a Safety Injection test signal, and
  - 2. Each Component Cooling Water System pump required to be OPERABLE starts automatically on a Safety Injection test signal.
  - 3. Each automatic valve serving the gross failed fuel detector and sample system heat exchangers actuates to its correct position on a Low Surge Tank Level test signal.

At the frequency specified in the Surveillance Frequency Control Program

\*The breaker for CCW pump 1C-SAB shall not be racked into either power source (SA or SB) unless the breaker from the applicable CCW pump (1A-SA or 1B-SB) is racked out.



## PLANT SYSTEMS

### 3/4.7.4 EMERGENCY SERVICE WATER SYSTEM

#### LIMITING CONDITION FOR OPERATION

---

3.7.4 At least two independent emergency service water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTION:

With only one emergency service water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

---

4.7.4 At least two emergency service water loops shall be demonstrated OPERABLE:

a. ~~At least once per 31 days~~ by verifying that each valve (manual, power-operated, or automatic) servicing safety-related equipment that is not locked, sealed, or otherwise secured in position is in its correct position; and

b. ~~At least once per 18 months~~ by verifying that:

1. Each automatic valve servicing safety-related equipment or isolating non-safety portions of the system actuates to its correct position on a Safety Injection test signal, and
2. Each emergency service water pump and each emergency service water booster pump starts automatically on a Safety Injection test signal.

At the frequency specified in the Surveillance Frequency Control Program

1



## PLANT SYSTEMS

### 3/4.7.5 ULTIMATE HEAT SINK

#### LIMITING CONDITION FOR OPERATION

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3.7.5 The ultimate heat sink shall be OPERABLE with:

- a. A minimum auxiliary reservoir water level at or above elevation 250 feet Mean Sea Level, USGS datum, and a minimum main reservoir water level at or above 206 feet Mean Sea Level, USGS datum, and
- b. A water temperature as measured at the respective intake structure of less than or equal to 94°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTION:

With the requirements of the above specification not satisfied, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

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at the frequency specified in the  
Surveillance Frequency Control  
Program

4.7.5 The ultimate heat sink shall be determined OPERABLE ~~at least once per 24 hours~~ by verifying the water temperature and water level to be within their limits.



## PLANT SYSTEMS

### 3/4.7.6 CONTROL ROOM EMERGENCY FILTRATION SYSTEM

#### LIMITING CONDITION FOR OPERATION (Continued)

- c. During movement of irradiated fuel assemblies or movement of loads over spent fuel pools.
1. With one CREFS train inoperable for reasons other than an inoperable CRE boundary, restore the inoperable CREFS train to OPERABLE status within 7 days or immediately initiate and maintain operation of the remaining OPERABLE CREFS train in the recirculation mode; or immediately suspend movement of irradiated fuel.
  2. With both CREFS trains inoperable for reasons other than an inoperable CRE boundary, or with the OPERABLE CREFS train required to be in the recirculation mode by Action c.1., not capable of being powered by an OPERABLE emergency power source, immediately suspend all operations involving movement of irradiated fuel assemblies or movement of loads over spent fuel pools.
  3. With one or more CREFS trains inoperable due to inoperable CRE boundary, immediately suspend movement of irradiated fuel assemblies or movement of loads over spent fuel pools.

#### SURVEILLANCE REQUIREMENTS

4.7.6 Each CREFS train shall be demonstrated OPERABLE:

- a. ~~At least once per 31 days on a STAGGERED TEST BASIS~~ by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 10 continuous hours with the heaters operating;
- b. ~~At least once per 18 months~~ or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following significant painting, fire, or chemical release in any ventilation zone communicating with the system by:
1. Verifying that the cleanup system satisfies the in-place penetration and bypass leakage testing acceptance criteria of less than 0.05% and uses the test procedure guidance in Regulatory Position C.5.a, C.5.c, and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the system flow rate is 4000 cfm  $\pm$  10% during system operation when tested in accordance with ANSI N510-1980; and

At the frequency specified in the Surveillance Frequency Control Program



## PLANT SYSTEMS

### CONTROL ROOM EMERGENCY FILTRATION SYSTEM

#### SURVEILLANCE REQUIREMENTS (Continued)

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2. Verifying, within 31 days after removal, that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, has a methyl iodide penetration of  $\leq 0.5\%$  when tested at a temperature of  $30^{\circ}\text{C}$  and at a relative humidity of 70% in accordance with ASTM D3803-1989.
- c. After every 720 hours of charcoal adsorber operation, by verifying, within 31 days after removal, that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, has a methyl iodide penetration of  $\leq 0.5\%$  when tested at a temperature of  $30^{\circ}\text{C}$  and at a relative humidity of 70% in accordance with ASTM D3803-1989.
- d. ~~At least once per 18 months by:~~
  1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 5.1 inches water gauge while operating the system at a flow rate of  $4000 \text{ cfm} \pm 10\%$ ;
  2. Verifying that, on either a Safety Injection or a High Radiation test signal, the system automatically switches into an isolation with recirculation mode of operation with flow through the HEPA filters and charcoal adsorber banks;
  3. Deleted.
  4. Verifying that the heaters dissipate  $14 \pm 1.4 \text{ kW}$  when tested in accordance with ANSI N510-1980; and
  5. Deleted.
- e. After each complete or partial replacement of a HEPA filter bank, by verifying that the unit satisfies the in-place penetration and bypass leakage testing acceptance criteria of less than 0.05% in accordance with ANSI N510-1980 for a DOP test aerosol while operating the system at a flow rate of  $4000 \text{ cfm} \pm 10\%$ ; and
- f. After each complete or partial replacement of a charcoal adsorber bank, by verifying that the cleanup system satisfies the in-place penetration leakage testing acceptance criteria of less than 0.05% in accordance with ANSI N510-1980 for a halogenated hydrocarbon refrigerant test gas while operating the system at a flow rate of  $4000 \text{ cfm} \pm 10\%$ .
- g. Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.

At the frequency  
specified in the  
Surveillance Frequency  
Control Program



## PLANT SYSTEMS

### 3/4.7.7 REACTOR AUXILIARY BUILDING (RAB) EMERGENCY EXHAUST SYSTEM

#### LIMITING CONDITION FOR OPERATION

3.7.7 Two independent RAB Emergency Exhaust Systems shall be OPERABLE.\*

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTION:

- a. With one RAB Emergency Exhaust System inoperable, restore the inoperable system to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With two RAB Emergency Exhaust Systems inoperable due to an inoperable RAB Emergency Exhaust System boundary, restore the RAB Emergency Exhaust System boundary to OPERABLE status within 24 hours. Otherwise, be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

4.7.7 Each RAB Emergency Exhaust System shall be demonstrated OPERABLE:

At the  
frequency  
specified in the  
Surveillance  
Frequency  
Control  
Program

- a. ~~At least once per 31 days on a STAGGERED TEST BASIS~~ by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 10 continuous hours with the heaters operating;
- b. ~~At least once per 18 months~~ or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following significant painting, fire, or chemical release in any ventilation zone communicating with the system by:
  1. Verifying that the cleanup system satisfies the in-place penetration and bypass leakage testing acceptance criteria of less than 0.05% and uses the test procedure guidance in Regulatory Positions C.5.a, C.5.c, and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the unit flow rate is 6800 cfm  $\pm$  10% during system operation when tested in accordance with ANSI N510-1980;
  2. Verifying, within 31 days after removal, that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, has a methyl iodine penetration of  $\leq$  2.5% when tested at a temperature of 30°C and at a relative humidity of 70% in accordance with ASTM D3803-1989.

\* The RAB Emergency Exhaust Systems boundary may be opened intermittently under administrative controls.



## REACTOR AUXILIARY BUILDING (RAB) EMERGENCY EXHAUST SYSTEM

## SURVEILLANCE REQUIREMENTS (Continued)

- c. After every 720 hours of charcoal adsorber operation, by verifying, within 31 days after removal, that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, has a methyl iodide penetration of  $\leq 2.5\%$  when tested at a temperature of  $30^{\circ}\text{C}$  and at a relative humidity of 70% in accordance with ASTM D3803-1989.
- d. ~~At least once per 18 months~~ by:
- At the frequency specified in the Surveillance Frequency Control Program
1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber bank is less than 4.1 inches water gauge while operating the unit at a flow rate of  $6800 \text{ cfm} \pm 10\%$ .
  2. Verifying that the system starts on a Safety Injection test signal.
  3. Verifying that the system maintains the areas served by the exhaust system at a negative pressure of greater than or equal to  $1/8$  inch water gauge relative to the outside atmosphere.
  4. Verifying that the filter cooling bypass valve is locked in the balanced position, and
  5. Verifying that the heaters dissipate  $40 \pm 4 \text{ kW}$  when tested in accordance with ANSI N510-1980.
- e. After each complete or partial replacement of a HEPA filter bank, by verifying that the unit satisfies the in-place penetration leakage testing acceptance criteria of less than 0.05% in accordance with ANSI N510-1980 for a DOP test aerosol while operating the unit at a flow rate of  $6800 \text{ cfm} \pm 10\%$ ; and
- f. After each complete or partial replacement of a charcoal adsorber bank, by verifying that the unit satisfies the in-place penetration leakage testing acceptance criteria of less than 0.05% in accordance with ANSI N510-1980 for a halogenated hydrocarbon refrigerant test gas while operating the unit at a flow rate of  $6800 \text{ cfm} \pm 10\%$ .



## PLANT SYSTEMS

### 3/4 7.13 ESSENTIAL SERVICES CHILLED WATER SYSTEM

#### LIMITING CONDITION FOR OPERATION

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3.7.13 At least two independent Essential Services Chilled Water System loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTION:

With only one Essential Services Chilled Water System loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

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4.7.13 The Essential Services Chilled Water System shall be demonstrated OPERABLE by:

- a. Performance of surveillances as required by the Inservice Testing Program, and
- b. ~~At least once per 18 months~~ by demonstrating that:

At the frequency  
specified in the  
Surveillance  
Frequency Control  
Program

- 1. Non-essential portions of the system are automatically isolated upon receipt of a Safety Injection actuation signal, and
- 2. The system starts automatically on a Safety Injection actuation signal.





## PLANT SYSTEMS

### 3/4.7.14 FUEL STORAGE POOL BORON CONCENTRATION

#### LIMITING CONDITION FOR OPERATION

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3.7.14 The boron concentration of spent fuel pools shall be  $\geq 2000$  ppm.

APPLICABILITY: At ALL TIMES for pools that contain nuclear fuel.

#### ACTION:

- a. With the spent fuel pool boron concentration not within the limits, immediately suspend movement of fuel assemblies.
- b. Immediately initiate action to restore pool boron concentration within the limit.

#### SURVEILLANCE REQUIREMENTS

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4.7.14 ~~At least once every 7 days~~ verify spent fuel pool boron concentration is within the limit by:

- a. Sampling the water volume connected to or in applicable pools.
- b. In addition to 4.7.14.a, sampling an individual pool containing nuclear fuel if the pool is isolated from other pools.

At the frequency  
specified in the  
Surveillance  
Frequency Control  
Program