

### 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 1 hour.

##### SURVEILLANCE REQUIREMENT

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4.4.1.1 The above required reactor coolant loops shall be verified to be in operation and circulating reactor coolant in accordance with the Surveillance Frequency Control Program.

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\*See Special Test Exception 3.10.4.

REACTOR COOLANT SYSTEM

HOT STANDBY

LIMITING CONDITION FOR OPERATION

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- 3.4.1.2 a. At least two of the reactor coolant loops listed below shall be OPERABLE:
1. Reactor Coolant Loop 21 and its associated steam generator and reactor coolant pump,
  2. Reactor Coolant Loop 22 and its associated steam generator and reactor coolant pump,
  3. Reactor Coolant Loop 23 and its associated steam generator and reactor coolant pump,
  4. Reactor Coolant Loop 24 and its associated steam generator and reactor coolant pump.
- b. At least one of the above coolant loops shall be in operation\* when the rod control system is deenergized\*\*.
- c. All of the above coolant loops shall be in operation when the rod control system is energized\*\*.

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 no reactor coolant 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 coolant loop to operation.

## REACTOR COOLANT SYSTEM

### HOT STANDBY

#### 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 to be OPERABLE in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignments and indicated power availability.

4.4.1.2.2 At least one cooling loop shall be verified to be in operation and circulating reactor coolant in accordance with the Surveillance Frequency Control Program.

4.4.1.2.3 The required steam generator(s) shall be determined OPERABLE by verifying secondary side water level to be greater than or equal to 5% (narrow range) in accordance with the Surveillance Frequency Control Program.

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\* All reactor coolant pumps may be de-energized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the reactor coolant system boron concentration (2) core outlet temperature is maintained at least 10°F below saturation temperature, and (3) the rod control system is de-energized\*\*

\*\* The rod control system shall be considered de-energized when one or more of the following conditions exist:

- 1) Both Rod Drive MG set motor breakers are open.
- 2) Both Rod Drive MG set generator breakers are open.
- 3) A combination of at least three of the Reactor Trip and/or Reactor Trip Bypass Breakers are open.

If none of the above conditions for de-energizing the rod control system are met; the system shall be considered energized.

## REACTOR COOLANT SYSTEM

### HOT SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

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- 3.4.1.3 a. At least two of the coolant loops listed below shall be OPERABLE:
1. Reactor Coolant Loop 21 and its associated steam generator and reactor coolant pump,\*
  2. Reactor Coolant Loop 22 and its associated steam generator and reactor coolant pump,\*
  3. Reactor Coolant Loop 23 and its associated steam generator and reactor coolant pump,\*
  4. Reactor Coolant Loop 24 and its associated steam generator and reactor coolant pump,\*
  5. Residual Heat Removal Loop 21,
  6. Residual Heat Removal Loop 22.
- b. At least one of the above coolant loops shall be in operation.\*\*

APPLICABILITY: MODE 4

#### ACTION:

- a. With less than the above required loops OPERABLE, immediately initiate corrective action to return the required loops to OPERABLE status as soon as possible; be in COLD SHUTDOWN within 20 hours.
- b. With no coolant 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 coolant loop to operation.

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\* A reactor coolant pump shall not be started with one or more of the RCS cold leg temperatures less than or equal to the POPS enable temperature specified in the PTLR unless 1) the pressurizer water volume is less than 1650 cubic feet (equivalent to approximately 92% of level) or 2) the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures.

\*\* All reactor coolant pumps and residual heat removal pumps may be de-energized 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

### SURVEILLANCE REQUIREMENTS

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4.4.1.3.2 The required reactor coolant pump(s), if not in operation, shall be determined to be OPERABLE in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignments and indicated power availability.

4.4.1.3.3 The required steam generator(s) shall be determined OPERABLE by verifying secondary side water level to be greater than or equal to 5% (narrow range) in accordance with the Surveillance Frequency Control Program.

4.4.1.3.4 At least one coolant loop shall be verified to be in operation and circulating reactor coolant in accordance with the Surveillance Frequency Control Program.

## REACTOR COOLANT SYSTEM

### COLD SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

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3.4.1.4 Two# residual heat removal loops shall be OPERABLE\* and at least one RHR loop shall be in operation.\*\*

APPLICABILITY: MODE 5.##

ACTION:

- a. With less than the above required loops operable, immediately initiate corrective action to return the required 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 At least one residual heat removal loop shall be verified to be in operation and circulating reactor coolant in accordance with the Surveillance Frequency Control Program.

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# One RHR loop may be inoperable for up to two hours for surveillance testing, provided the other RHR loop is OPERABLE and in operation. Additionally, four filled reactor coolant loops, with at least two steam generators with their secondary side water levels greater than or equal to 5% (narrow range), may be substituted for one residual heat removal loop.

## A reactor coolant pump shall not be started with one or more of the RCS cold leg temperatures less than or equal to the POPS enable temperature specified in the PTLR unless 1) the pressurizer water volume is less than 1650 cubic feet (equivalent to approximately 92% of level), or 2) the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures.

\* Systems supporting RHR loop operability may be excepted as follows:

- a. The normal or emergency power source may be inoperable.

\*\* The residual heat removal pumps may be de-energized for up to 2 hours 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.

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