

## REACTOR COOLANT SYSTEM

### HOT STANDBY

#### LIMITING CONDITION FOR OPERATION

- 3.4.1.2 At least two of the reactor coolant loops listed below shall be OPERABLE with at least two reactor coolant loops in operation when the Reactor Trip System breakers are closed and at least one reactor coolant loop 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,
  - d. Reactor Coolant Loop D 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 one hour open the Reactor Trip System breakers.
- c. With no Reactor Coolant loop in operation, suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1.1 and immediately initiate corrective action to return the required Reactor Coolant loop to operation

#### SURVEILLANCE REQUIREMENTS

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

4.4.1.2.2 The required steam generators shall be determined OPERABLE by verifying secondary side water level to be greater than or equal to 21 percent at least once per 12 hours.

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

\* All Reactor Coolant pumps may be de-energized for up to 1 hour provided (1) no operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1.1, and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

## REACTOR COOLANT SYSTEM

### HOT SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

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- 3.4.1.3      a.    At least two of the reactor coolant and/or Residual heat removal (RHR) loops listed below shall be OPERABLE:
1.    Reactor Coolant Loop A and its associated steam generator and reactor coolant pump,\*
  2.    Reactor Coolant Loop B and its associated steam generator and reactor coolant pump,\*
  3.    Reactor Coolant Loop C and its associated steam generator and reactor coolant pump,\*
  4.    Reactor Coolant Loop D and its associated steam generator and reactor coolant pump,\*
  5.    Residual Heat Removal Loop A,
  6.    Residual Heat Removal Loop B.
- b.    At least one of the above reactor coolant and/or RHR 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 reactor coolant or RHR loop in operation, suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1.1 and immediately initiate corrective action to return the required coolant loop to operation

\*\*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 introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1.1, and 2) core outlet temperature is maintained at least 10°F below saturation temperature.

\*A reactor coolant pump shall not be restarted unless a steam bubble exists in the pressurizer.

## REACTOR COOLANT SYSTEM

### COLD SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

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3.4.1.4 Two<sup>#</sup> residual heat removal (RHR) 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 RHR/reactor coolant loops OPERABLE, immediately initiate corrective action to return the required RHR/reactor coolant loops to OPERABLE status as soon as possible.
- b. With no RHR loop in operation, suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1.2 and immediately initiate corrective action to return the required RHR loop to operation.

#### SURVEILLANCE REQUIREMENTS

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4.4.1.4 The residual heat removal loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

# One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation. Four filled reactor coolant loops with at least 2 steam generators having levels greater than or equal to 10 percent (wide-range indication) may be substituted for one RHR loop.

\* The normal or emergency power source may be inoperable.

\*\* The RHR pumps may be de-energized for up to 1 hour provided 1) no operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1.2, and 2) core outlet temperature is maintained at least 10°F below saturation temperature.

## REACTOR COOLANT SYSTEM

### 3/4.4.2 SAFETY VALVES - SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

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3.4.2 A minimum of one pressurizer code safety valve shall be OPERABLE# with a lift setting of 2485 PSIG  $\pm$  3%.\*

APPLICABILITY: MODES 4 and 5.

ACTION:

MODE 4

With no pressurizer code safety valve OPERABLE, immediately suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1.1 and place an OPERABLE RHR loop into operation in the shutdown cooling mode.

MODE 5

With no pressurizer code safety valve OPERABLE, immediately suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1.2 and place an OPERABLE RHR loop into operation in the shutdown cooling mode.

#### SURVEILLANCE REQUIREMENTS

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4.4.2 No additional Surveillance Requirements other than those required by Specification 4.0.5. Following testing, lift settings shall be within  $\pm$  1%.

\* The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

# A safety valve is not required OPERABLE provided at least one safety valve is removed from the pressurizer and the associated RCS breach is not covered by a pressure retaining membrane.

## ELECTRICAL POWER SYSTEMS

### SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

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3.8.1.2 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Diesel generator sets 1A-A and 2A-A or 1B-B and 2B-B each with:
  1. Two diesels driving a common generator,
  2. Two engine-mounted fuel tanks containing a minimum volume of 250 gallons of fuel per tank,
  3. A fuel storage system containing a minimum volume of 62,000 gallons of fuel,
  4. A fuel transfer pump, and
  5. A separate 125-volt D.C. distribution panel, 125-volt D.C. battery bank and associated charger.

APPLICABILITY: MODES 5 and 6.

#### ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, suspend all operations involving CORE ALTERATIONS and suspend operations involving positive reactivity additions that could result in loss of required shutdown margin or boron concentration.

#### SURVEILLANCE REQUIREMENTS

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4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the Surveillance Requirements of 4.8.1.1.1 and 4.8.1.1.2 (except for requirement 4.8.1.1.2.a.5), and 4.8.1.1.3.

## REFUELING OPERATIONS

### 3/4.9.2 INSTRUMENTATION

#### LIMITING CONDITION FOR OPERATION

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3.9.2 As a minimum, two source range neutron flux monitors shall be OPERABLE and operating, each with continuous visual indication in the control room and one with audible indication in the containment and control room.

APPLICABILITY: MODE 6.

ACTION:

- a. With one of the above required monitors inoperable or not operating, immediately suspend all operations involving CORE ALTERATIONS and suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet LCO 3.9.1.
- b. With both of the above required monitors inoperable or not operating, determine the boron concentration of the reactor coolant system at least once per 12 hours.
- c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.9.2 Each source range neutron flux monitor shall be demonstrated OPERABLE by performance of:

- a. A CHANNEL CHECK at least once per 12 hours,
- b. A CHANNEL FUNCTIONAL TEST at least once per 7 days, and
- c. A CHANNEL FUNCTIONAL TEST within 8 hours prior to the initial start of CORE ALTERATIONS.

## REFUELING OPERATIONS

### 3/4.9.8 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

#### ALL WATER LEVELS

#### LIMITING CONDITION FOR OPERATION

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3.9.8.1 At least one residual heat removal (RHR) loop shall be in operation.

APPLICABILITY: MODE 6.

#### ACTION:

- a. With less than one residual heat removal loop in operation, except as provided in b. below, suspend all operations involving an increase in the reactor decay heat load and suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet LCO 3.9.1. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.
- b. The residual heat removal loop may be removed from operation for up to 1 hour per 8 hour period during the performance of CORE ALTERATIONS in the vicinity of the reactor pressure vessel hot legs.
- c. The provisions of Specification 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.9.8.1 At least one residual heat removal loop shall be verified to be in operation and circulating reactor coolant at a flow rate of greater than or equal to 2000 gpm at least once per 12 hours.

### 3/4.8 ELECTRICAL POWER SYSTEMS

#### BASES

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#### 3/4.8.1 AND 3/4.8.2 A.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS

According to Generic Letter 84-15, 24 hours is reasonable to confirm that the OPERABLE diesel generators are not affected by the same problem as the inoperable diesel generator.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during shutdown and refueling ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit status.

With the minimum required AC power sources not available, it is required to suspend CORE ALTERATIONS and operations involving positive reactivity additions that could result in loss of required SDM (Mode 5) or boron concentration (Mode 6). Suspending positive reactivity additions that could result in failure to meet minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than or equal to that required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

The requirements of Specification 3.8.2.1 provide those actions to be taken for the inoperability of A.C. Distribution Systems. Action a of this specification provides an 8-hour action for the inoperability of one or more A.C. boards. Action b of this specification provides a relaxation of the 8-hour action to 24-hours provided the Vital Instrument Power Board is inoperable solely as a result of one inoperable inverter and the board has been energized within 8 hours. In this condition the requirements of Action a do not have to be applied. Action b is not intended to provide actions for inoperable inverters, which is addressed by the operability requirements for the boards, and is included only for relief from the 8-hour action of Action a when only one inverter is affected. More than one inverter inoperable will result in the inoperability of the associated 120 Volt A.C. Vital Instrument Power Board(s) in accordance with Action a. With more than one inverter inoperable entry into the actions of TS 3.0.3 is not applicable because Action a includes provisions for multiple inoperable inverters as attendant equipment to the boards.

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9 "Selection of Diesel Generator Set Capacity for Standby Power Supplies", March 10, 1971, 1.108 "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977, and 1.137 "Fuel-Oil Systems for Standby Diesel Generators," Revision 1, October 1979. The surveillance requirements for the diesel generator load-run test and the 24-hour endurance and margin test are in accordance with Regulatory Guide 1.9, Revision 3, July 1993, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plant." During the diesel generator endurance and margin surveillance test, momentary transients outside the kw and kvar load ranges do not invalidate the test results. Similarly, during the diesel generator load-run test, momentary transients outside the kw load range do not invalidate the test results.



### 3/4.8 ELECTRICAL POWER SYSTEMS

#### BASES

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Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. 6800 volts is the minimum steady state output voltage and the 10 second transient value. 6800 volts is 98.6% of nominal bus voltage of 6900 volts and is based on the minimum voltage required for the diesel generator supply breaker to close on the 6.9 kV shutdown board. The specified maximum steady state output voltage of 7260 volts is based on the degraded over voltage relay setpoint and is equivalent to 110% of the nameplate rating of the 6600 volt motors. The specified minimum and maximum frequencies of the diesel generator are 58.8 Hz and 61.2 Hz, respectively. These values are equal to  $\pm 2\%$  of the 60 Hz nominal frequency and are derived from the recommendations given in regulatory Guide 1.9.

The Surveillance Requirement for demonstrating the OPERABILITY of the Station batteries are based on the recommendations of Regulatory Guide 1.129 "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."