

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 at least once per 12 hours.

\*See Special Test Exception 3.10.5

# REACTOR COOLANT SYSTEM

## HOT STANDBY

### LIMITING CONDITION FOR OPERATION

- 3.4.1.2 a. At least two of the reactor coolant loops listed below shall be OPERABLE:
1. Reactor Coolant Loop 1 and its associated steam generator and reactor coolant pump,
  2. Reactor Coolant Loop 2 and its associated steam generator and reactor coolant pump,
  3. Reactor Coolant Loop 3 and its associated steam generator and reactor coolant pump,
  4. Reactor Coolant Loop 4 and its associated steam generator and reactor coolant pump.
- b. At least one of the above coolant loops shall be in operation.\*

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.

### 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 At least one cooling loop 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 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

## 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 1 and its associated steam generator and reactor coolant pump,\*
  2. Reactor Coolant Loop 2 and its associated steam generator and reactor coolant pump,\*
  3. Reactor Coolant Loop 3 and its associated steam generator and reactor coolant pump,\*
  4. Reactor Coolant Loop 4 and its associated steam generator and reactor coolant pump,\*
  5. Residual Heat Removal - East,\*\*
  6. Residual Heat Removal - West,\*\*
- b. At least one of the above coolant loops shall be in operation.\*\*\*

APPLICABILITY: MODES 4 and 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; 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 188 °F unless 1) the pressurizer water volume is less than 52.00% of span or 2) the secondary water temperature of each steam generator is less than 50 °F above each of the RCS cold leg temperatures. Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.

\*\*The normal or emergency power source may be inoperable in MODE 5.

\*\*\*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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4.4.1.3.1 The required residual heat removal loop(s) shall be determined OPERABLE per Specification 4.0.5.

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

4.4.1.3.3 The required steam generator(s) shall be determined OPERABLE by verifying secondary side level to be greater than or equal to 25% of wide range instrument span at least once per 12 hours.

4.4.1.3.4 At least one coolant loop shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.

## REFUELING OPERATIONS

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

#### LIMITING CONDITION FOR OPERATION

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3.9.8.1 At least one residual heat removal 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 or a reduction in boron concentration of the Reactor Coolant System. 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 A residual heat removal loop shall be determined to be in operation and circulating reactor coolant at a flow rate of  $\geq 3000$  gpm at least once per 24 hours.

REFUELING OPERATIONS

LOW WATER LEVEL

LIMITING CONDITION FOR OPERATION

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3.9.8.2 Two independent Residual Heat Removal (RHR) loops shall be OPERABLE.\*

APPLICABILITY: MODE 6 when the water level above the top of the reactor pressure vessel flange is less than 23 feet with the upper internals removed.

ACTION:

- a. With less than the required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status as soon as possible.
- b. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

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4.9.8.2 The required Residual Heat Removal loops shall be determined OPERABLE per Specification 4.0.5.

\*The normal or emergency power source may be inoperable for each RHR loop.

## REFUELING OPERATIONS

### 3/4.9.10 WATER LEVEL - REACTOR VESSEL

#### LIMITING CONDITION FOR OPERATION

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3.9.10 At least 23 feet of water shall be maintained over the top of the reactor pressure vessel flange.

APPLICABILITY: During movement of fuel assemblies or control rods within the reactor pressure vessel while in MODE 6 with the upper internals removed.

#### ACTION:

With the requirements of the above specification not satisfied, suspend all operations involving movement of fuel assemblies or control rods within the pressure vessel. The provisions of Specification 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.9.10 The water level shall be determined to be at least its minimum required depth within 2 hours prior to the start of and at least once per 24 hours thereafter during movement of fuel assemblies or control rods.

BASES

3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION

The plant is designed to operate with all reactor coolant loops in operation, and maintain DNBR above 1.30 during all normal operations and anticipated transients. In MODES 1 and 2 with one reactor coolant loop not in operation this specification requires that the plant be in at least HOT STANDBY within 1 hour.

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, single failure considerations require that two loops be OPERABLE.

In MODES 4 and 5, a single reactor coolant loop or RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops be OPERABLE. Thus, if the reactor coolant loops are not OPERABLE, this specification requires two RHR loops to be OPERABLE.

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing; prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump with one or more RCS cold legs less than or equal to 188°F are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits of Appendix G by either (1) restricting the water volume in the pressurizer and thereby providing a volume for the primary coolant to expand into, or (2) by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 50 °F above each of the RCS cold leg temperatures.



## 3/4.4 REACTOR COOLANT SYSTEM

### BASES

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#### 3/4.4.2 and 3/4.4.3 SAFETY VALVES

The pressurizer code safety valves operate to prevent the RCS from being pressurized above its Safety Limit of 2735 psig. Each safety valve is designed to relieve 420,000 lbs per hour of saturated steam at the valve set point. The relief capacity of a single safety valve is adequate to relieve any overpressure condition which could occur during shutdown. In the event that no safety valves are OPERABLE, an operating RHR loop, connected to the RCS, provides overpressure relief capability and will prevent RCS overpressurization.

During operation, all pressurizer code safety valves must be OPERABLE to prevent the RCS from being pressurized above its safety limit of 2735 psig. The combined relief capacity of all of these valves is greater than the maximum surge rate resulting from a complete loss of load assuming no reactor trip until the first Reactor Protective System trip set point is reached (i.e., no credit is taken for a direct reactor trip on the loss of load) and also assuming no operation of the power operated relief valves or steam dump valves.

Demonstration of the safety valves' lift settings will occur only during shutdown and will be performed in accordance with the provisions of Section XI of the ASME Boiler and Pressure Code, 1974 Edition.

## REFUELING OPERATIONS

### BASES

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#### 3/4.9.6 MANIPULATOR CRANE OPERABILITY

The OPERABILITY requirements for the manipulator cranes ensure that:  
1) manipulator cranes will be used for movement of control rods and fuel assemblies 2) each crane has sufficient load capacity to lift a control rod or fuel assembly and 3) the core internals and pressure vessel are protected from excessive lifting force in the event they are inadvertently engaged during lifting operations.

#### 3/4.9.7 CRANE TRAVEL - SPENT FUEL STORAGE BUILDING

The restriction on movement of loads in excess of the nominal weight of a fuel assembly over other fuel assemblies ensures that no more than the contents of one fuel assembly will be ruptured in the event of a fuel handling accident. This assumption is consistent with the activity release assumed in the accident analyses.

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

The requirement that at least one residual heat removal (RHR) loop be in operation ensures that (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F as required during the REFUELING MODE, and (2) sufficient coolant circulation is maintained through the reactor core to minimize the effect of a boron dilution incident and prevent boron stratification.

The requirement to have two RHR loops OPERABLE when there is less than 23 feet of water above the reactor pressure vessel flange ensures that a single failure of the operating RHR loop will not result in a complete loss of residual heat removal capability. With the reactor vessel head removed and 23 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling. Thus, in the event of a failure of the operating RHR loop, adequate time is provided to initiate emergency procedures to cool the core.

#### 3/4.9.9 CONTAINMENT PURGE AND EXHAUST ISOLATION SYSTEM

The OPERABILITY of this system ensures that the containment vent and purge penetrations will be automatically isolated upon detection of high radiation levels within the containment. The OPERABILITY of this system is required to restrict the release of radioactive material from the containment atmosphere to the environment.

## REFUELING OPERATIONS

### BASES

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#### 3/4.9.10 and 3/4.9.11 WATER LEVEL - REACTOR VESSEL AND STORAGE POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gap activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the accident analysis.

#### 3/4.9.12 STORAGE POOL VENTILATION SYSTEM

The limitations on the storage pool ventilation system ensure that all radioactive material released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal adsorber prior to discharge to the atmosphere. The OPERABILITY of this system and the resulting iodine removal capacity are consistent with the assumptions of the accident analyses.

#### 3/4.9.13 SPENT FUEL CASK MOVEMENT

The limitations of this specification ensures that, during insertion or removal of spent fuel casks from the spent fuel pool, fuel cask movement will be constrained to the path and lift height assumed in the Cask Drop Protection System safety analysis. Restricting the spent fuel cask movement within these requirements provides protection for the spent fuel pool and stored fuel from the effects of a fuel cask drop accident.

#### 3/4.9.14 SPENT FUEL CASK DROP PROTECTION SYSTEM

The limitations on the use of spent fuel casks weighing in excess of 110 tons (nominal) provides assurance that the spent fuel pool would not be damaged by a dropped fuel cask since this weight is consistent with the assumptions used in the safety analysis for the performance of the Cask Drop Protection System.

Attachment No. 3 to AEP:NRC:00420A  
Donald C. Cook Nuclear Plant Unit Nos. 1 and 2  
Decay Heat Removal Technical Specifications

### 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 at least once per 12 hours.

\*See Special Test Exception 3.10.4

REACTOR COOLANT SYSTEM

HOT STANDBY

LIMITING CONDITION FOR OPERATION

- 3.4.1.2 a. At least two of the reactor coolant loops listed below shall be OPERABLE:
1. Reactor Coolant Loop 1 and its associated steam generator and reactor coolant pump,
  2. Reactor Coolant Loop 2 and its associated steam generator and reactor coolant pump,
  3. Reactor Coolant Loop 3 and its associated steam generator and reactor coolant pump,
  4. Reactor Coolant Loop 4 and its associated steam generator and reactor coolant pump.
- b. At least one of the above coolant loops shall be in operation.\*

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.

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 At least one cooling loop 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 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

## SHUTDOWN

### LIMITING CONDITION FOR OPERATION

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

APPLICABILITY: MODES 4 and 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; 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.

\*A reactor coolant pump shall not be started with one or more of the RCS cold leg temperatures less than or equal to 152 °F unless 1) the pressurizer water volume is less than 62.00% of span or 2) the secondary water temperature of each steam generator is less than 50 °F above each of the RCS cold leg temperatures. Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.

\*\*The normal or emergency power source may be inoperable in MODE 5.

\*\*\*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

4.4.1.3.1 The required residual heat removal loop(s) shall be determined OPERABLE per Specification 4.0.5.

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

4.4.1.3.3 The required steam generator(s) shall be determined OPERABLE by verifying secondary side level to be greater than or equal to 25% of wide range instrument span at least once per 12 hours.

4.4.1.3.4 At least one coolant loop shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.



## REFUELING OPERATIONS

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

#### LIMITING CONDITION FOR OPERATION

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3.9.8.1 At least one residual heat removal 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 or a reduction in boron concentration of the Reactor Coolant System. 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 A residual heat removal loop shall be determined to be in operation and circulating reactor coolant at a flow rate of  $\geq 3000$  gpm at least once per 24 hours.

## REFUELING OPERATIONS

### LOW WATER LEVEL

#### LIMITING CONDITION FOR OPERATION

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3.9.8.2 Two independent Residual Heat Removal (RHR) loops shall be OPERABLE.\*

APPLICABILITY: MODE 6 when the water level above the top of the reactor pressure vessel flange is less than 23 feet with the upper internals removed.

#### ACTION:

- a. With less than the required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status as soon as possible.
- b. The provisions of Specification 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.9.8.2 The required Residual Heat Removal loops shall be determined OPERABLE per Specification 4.0.5.

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\*The normal or emergency power source may be inoperable for each RHR loop.

## REFUELING OPERATIONS

### 3/4.9.10 WATER LEVEL - REACTOR VESSEL

#### LIMITING CONDITION FOR OPERATION

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3.9.10 At least 23 feet of water shall be maintained over the top of the reactor pressure vessel flange.

APPLICABILITY: During movement of fuel assemblies or control rods within the reactor pressure vessel while in MODE 6 with the upper internals removed.

ACTION:

With the requirements of the above specification not satisfied, suspend all operations involving movement of fuel assemblies or control rods within the pressure vessel. The provisions of Specification 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.9.10 The water level shall be determined to be at least its minimum required depth within 2 hours prior to the start of and at least once per 24 hours thereafter during movement of fuel assemblies or control rods.

BASES

3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION

The plant is designed to operate with all reactor coolant loops in operation, and maintain DNBR above 1.30 during all normal operations and anticipated transients. In MODES 1 and 2 with one reactor coolant loop not in operation this specification requires that the plant be in at least HOT STANDBY within 1 hour.

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, single failure considerations require that two loops be OPERABLE.

In MODES 4 and 5, a single reactor coolant loop or RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops be OPERABLE. Thus, if the reactor coolant loops are not OPERABLE, this specification requires two RHR loops to be OPERABLE.

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump with one or more RCS cold legs less than or equal to 152 °F are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits of Appendix G by either (1) restricting the water volume in the pressurizer and thereby providing a volume for the primary coolant to expand into, or (2) by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 50 °F above each of the RCS cold leg temperatures.

## 3/4.4 REACTOR COOLANT SYSTEM

### BASES

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#### 3/4.4.2 and 3/4.4.3 SAFETY VALVES

The pressurizer code safety valves operate to prevent the RCS from being pressurized above its Safety Limit of 2735 psig. Each safety valve is designed to relieve 420,000 lbs per hour of saturated steam at the valve set point.. The relief capacity of a single safety valve is adequate to relieve any overpressure condition which could occur during shutdown. In the event that no safety valves are OPERABLE, an operating RHR loop, connected to the RCS, provides overpressure relief capability and will prevent RCS overpressurization.

During operation, all pressurizer code safety valves must be OPERABLE to prevent the RCS from being pressurized above its safety limit of 2735 psig. The combined relief capacity of all of these valves is greater than the maximum surge rate resulting from a complete loss of load assuming no reactor trip until the first Reactor Protective System trip set point is reached (i.e., no credit is taken for a direct reactor trip on the loss of load) and also assuming no operation of the power operated relief valves or steam dump valves.

## REFUELING OPERATIONS

### BASES

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#### 3/4.9.6 MANIPULATOR CRANE OPERABILITY

The OPERABILITY requirements for the manipulator cranes ensure that: 1) manipulator cranes will be used for movement of control rods and fuel assemblies, 2) each crane has sufficient load capacity to lift a control rod or fuel assembly, and 3) the core internals and pressure vessel are protected from excessive lifting force in the event they are inadvertently engaged during lifting operations.

#### 3/4.9.7 CRANE TRAVEL - SPENT FUEL STORAGE BUILDING

The restriction on movement of loads in excess of the nominal weight of a fuel and control rod assembly and associated handling tool over other fuel assemblies in the storage pool ensures that in the event this load is dropped 1) the activity release will be limited to that contained in a single fuel assembly, and 2) any possible distortion of fuel in the storage racks will not result in a critical array. This assumption is consistent with the activity release assumed in the accident analyses.

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

The requirement that at least one residual heat removal (RHR) loop be in operation ensures that (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F as required during the REFUELING MODE, and (2) sufficient coolant circulation is maintained through the reactor core to minimize the effect of a boron dilution incident and prevent boron stratification.

The requirement to have two RHR loops OPERABLE when there is less than 23 feet of water above the reactor pressure vessel flange ensures that a single failure of the operating RHR loop will not result in a complete loss of residual heat removal capability. With the reactor vessel head removed and 23 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling. Thus, in the event of a failure of the operating RHR loop, adequate time is provided to initiate emergency procedures to cool the core.

## REFUELING OPERATIONS

### BASES

#### 3/4.9.9 CONTAINMENT PURGE AND EXHAUST ISOLATION SYSTEM

The OPERABILITY of this system ensures that the containment vent and purge penetrations will be automatically isolated upon detection of high radiation levels within the containment. The OPERABILITY of this system is required to restrict the release of radioactive material from the containment atmosphere to the environment.

#### 3/4.9.10 and 3/4.9.11 WATER LEVEL - REACTOR VESSEL AND STORAGE POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gas activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the accident analysis.

#### 3/4.9.12 STORAGE POOL VENTILATION SYSTEM

The limitations on the storage pool ventilation system ensure that all radioactive material released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal adsorber prior to discharge to the atmosphere. The OPERABILITY of this system and the resulting iodine removal capacity are consistent with the assumptions of the accident analyses.

#### 3/4.9.13 SPENT FUEL CASK MOVEMENT

The limitations of this specification ensures that, during insertion or removal of spent fuel casks from the spent fuel pool, fuel cask movement will be constrained to the path and lift height assumed in the Cask Drop Protection System safety analysis. Restricting the spent fuel cask movement within these requirements provides protection for the spent fuel pool and stored fuel from the effects of a fuel cask drop accident.

#### 3/4.9.14 SPENT FUEL CASK DROP PROTECTION SYSTEM

The limitations on the use of spent fuel casks weighing in excess of 110 tons (nominal) provides assurance that the spent fuel pool would not be damaged by a dropped fuel cask since this weight is consistent with the assumptions used in the safety analysis for the performance of the Cask Drop Protection System.