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LIMITING-CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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BASES

3/4.4 REACTOR COOLANT SYSTEM

COOLANT LOOPS AND COOLANT CIRCULATION

STARTUP AND POWER OPERATION

LIMITING CONDITION FOR OPERATION

3.4.1.1 Both reactor coolant loops and both reactor coolant pumps in each loop shall be in operation.

APPLICABILITY: MODES 1 and 2*.

ACTION

a. With one reactor coolant pump not in operation, STARTUP and POWER OPERATION may be initiated and may proceed provided THERMAL POWER is restricted to less than that allowed by Specification 2.2.1 and within 4 hours the Nuclear Overpower Trip Setpoint is reduced to the same values.

b. The provisions of specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.1.1 The Reactor Protection System Instrumentation channels specified in the applicable ACTION statement above shall be verified to have had their trip setpoints changed to the values specified in Table 2.2-1 for the applicable number of reactor coolant pumps operating either:

a. Within 4 hours after switching to a different pump combination if the switch is made while operating, or

b. Prior to reactor criticality if the switch is made while shutdown.

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

*See Special Test Exception 3.10.3.

REACTOR COOLANT SYSTEM

HOT STANDBY

LIMITING CONDITION FOR OPERATION

3.4.1.2 a. The reactor coolant loops listed below shall be OPERABLE:

1. Reactor Coolant Loop (A) and at least one associated reactor coolant pump.

2. Reactor Coolant Loop (B) and at least one associated reactor cool pump.

b. At least one of the above loops shall be in operation.*

APPLICABILITY: MODE 3

ACTION

a. With less than the two 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 initiate action to return a reactor coolant loop to operation.

c. The provisions of specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.1.2.1 The above required reactor coolant pumps, if not in operation, shall be determined to be OPERABLE at least 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.

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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, and (2) core outlet temperature is maintained at least 10oF below saturation temperature.

REACTOR COOLANT SYSTEM

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.4.1.3 a. At least two of the loops listed shall be OPERABLE:

1. Reactor Coolant Loop (A) and at least one associated reactor coolant pump,

2. Reactor Coolant Loop (B) and at least one associated reactor coolant pump,

3. Decay Heat Removal Loop (A),

4. Decay Heat Removal Loop (B),

b. At least one of the above loops shall be in operation.**

APPLICABILITY: MODE 4

ACTION

a. With less than the two above required loops OPERABLE, initiate corrective action to return the required loops to OPERABLE status as soon as possible or be in COLD SHUTDOWN within 20 hours.

b. With no loop in operation, suspend all operation involving a reduction in boron concentration of the Reactor Coolant System and initiate corrective action to return the required loop to operation.

c. The provisions of specifications 3.0.3 and 3.0.4 are not applicable.

**All reactor coolant pumps and decay 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.

SURVEILLANCE REQUIREMENTS

4.4.1.3.1 The required Reactor Coolant pump(s) and/or Decay Heat Removal pump(s) if not in operation, shall be determined to be OPERABLE at least once per 7 days by verifying correct breaker alignments and indicated power availability.

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

REACTOR COOLANT SYSTEM

COLD SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.4.1.4 Two# decay heat removal (DHR) loops shall be OPERABLE* and at least one DHR loop shall be in operation.**

APPLICABILITY: MODE 5

ACTION

a. With less than the two above required loops OPERABLE, initiate corrective action to return the required loops to OPERABLE status as soon as possible.

b. With no DHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and initiate corrective action to return the required DHR loop to operation.

SURVEILLANCE REQUIREMENTS

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

#The filled and intact reactor coolant system with one steam generator operable (per Specification 3.4.5) may be substitued for one decay heat removal loop.

*The normal or emergency power source may be inoperable.

**The operating decay heat removal pump 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.

REFUELING OPERATIONS

3/4.9.8 DECAY HEAT REMOVAL AND COOLANT RECIRCULATION

ALL WATER LEVELS

LIMITING CONDITION FOR OPERATION

3.9.8.1 At least one decay heat removal loop shall be in operation.

APPLICABILITY: MODE 6.

ACTION:

a. With less than one decay 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 decay heat removal loop may be removed from operation for up to 1 hour per 8 hour period during the performance of CORE ALTERATIONS to prevent water turbulence problems.

c. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.8.1 A decay heat removal loop shall be determined to be operating and circulating reactor coolant at a flow rate of $\geq$2700 gpm at least once per 24 hours.

REFUELING OPERATIONS

LOW WATER LEVEL

LIMITING CONDITION FOR OPERATION

3.9.8.2 Two decay heat removal (DHR) loops shall be OPERABLE.

APPLICABILITY: MODE 6 when the water level above the top of the irradiated fuel assemblies seated within the reactor pressure vessel is less than 23 feet.

ACTION

a. With less than the two required DHR loops OPERABLE, initiate corrective action to return the required loops to OPERABLE status.

b. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.8.2 No additional surveillance requirements other than those required by Specification 4.0.5.

3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION

The plant is designed to operate with both reactor coolant loops in operation, and to maintain DNBR above 1.30 during all normal operations and anticipated transients. With one reactor coolant pump not in operation in one loop, THERMAL POWER is restricted by the Nuclear Overpower Based on RCS Flow and AXIAL POWER IMBALANCE, ensuring that the DNBR will be maintained above 1.30 at the maximum possible THERMAL POWER for the number of reactor coolant pumps in operation or the local quality at the point of minimum DNBR equal to 22%, whichever is more restrictive.

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

In MODES 4 and 5, a single reactor coolant loop or DHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops be OPERABLE.

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

3/4.4.2 RELIEF VALVES - SHUTDOWN

The pressurizer code safety valves operate to prevent the RCS from being pressurized above its Safety Limit of 2750 psig. Each safety valve is designed to relieve 317,973 lbs per hour of saturated steam at the valve's setpoint.

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 DHR 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 2750 psig. The combined relief capacity of all of these valves is greater than the maximum surge rate resulting from any transient.

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.

3/4.4.3 RELIEF VALVES - OPERATING

The power operated relief valve (PORV) operates to relieve RCS pressure below the setting of the pressurizer code safety valves. This relief valve has a remotely operated block valve to provide a positive shutoff

3/4.9.6 FUEL HANDLING BRIDGE OPERABILITY

The OPERABILITY requirements of the hoist bridges used for movement of fuel assemblies ensures that: 1) fuel handling bridges will be used for movement of control rods and fuel assemblies, 2) each hoist has sufficient load capacity to lift a fuel element, 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 POOL 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 DECAY HEAT REMOVAL AND COOLANT CIRCULATION

The requirement that at least one decay heat removal 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 DHR loops OPERABLE when there is less than 23 feet of water above the core ensures that a single failure of the operating DHR loop will not result in a complete loss of decay heat removal capability. With the reactor vessel head removed and 23 feet of water above the core, a large heat sink is available for core cooling. Thus, in the event of a failure of the operating DHR 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 sytem ensures that the containment purge and exhaust 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 WATER LEVEL - REACTOR VESSEL WATER LEVEL

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 safety analysis.

3/4.9.11 STORAGE POOL

The requirement for missile shields to be installed over the storage pool ensures that the tornado missile protection assumptions are satisfied.

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 safety analysis.

3/4.9.12 STORAGE POOL VENTILATION

The requirement for the auxilliary building ventilation exhaust system servicing the storage pool area to be OPERABLE ensures that all radioactive material released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal absorber prior to discharge to the atmosphere. The OPERABILITY of this system and the resulting iodine removal capacity are consistent with the assumptions of the safety analyses.