15.3.2-2
Table 15.3.2-1
15.3.3-1
15.3.6-7
15.3.6-19
15.3.8-1

D. During power operation, the requirements of 15.3.2-B and C may be modified to allow the following components to be inoperable for a specified time. If the system is not restored to meet the requirements of 15.3.2-B or C within the time period specified, the appropriate reactor(s), except as otherwise noted, shall be placed in the hot shutdown condition within 6 hours and borated to a shutdown margin equivalent of at least 1.0% delta k/k at cold shutdown, no xenon conditions. If the requirements of 15.3.2-B or C are not satisfied within an additional 7 days, the appropriate reactor(s) shall be placed in the cold shutdown condition within the next 30 hours.

1. One of the two operable charging pumps associated with an operating reactor may be removed from service provided a charging pump associated with that reactor is restored to operable status within 72 hours.
2. One of the two boron injection flow paths specified in B.2 or C.2 may be out of service provided two boron injection flow paths are restored to operable status within 72 hours.
3. One of the boric acid transfer pumps designated in B.3 or C.3 may be out of service provided a boric acid transfer pump is restored to operable status within 72 hours.

Basis

The chemical and volume control system provides control of the reactor coolant system boron inventory. This is normally accomplished by using one or more charging pumps in series with one of the two boric acid transfer pumps. Above cold shutdown conditions, a minimum of two boron injection flow paths are required per unit to insure functional capability in the event that an assumed single active failure renders one of the flow paths inoperable. The boration volume available through any flow path is sufficient to provide the required shutdown margin at cold shutdown, xenon-free conditions from any expected operating condition. The ~~maximum~~ volume requirement is associated with boration from just critical, hot zero or full power, peak xenon with control rods at the insertion limit, to xenon-free, cold shutdown with the highest worth control rod assembly fully withdrawn. This requires approximately * ~~24,100~~ 26,600 gallons of ~~2000~~ 2700 ppm borated water from the refueling water storage tank (RWST) or the concentrations and volumes of borated water specified in Table 15.3.2-1 from the boric acid storage tanks (BASTs).

* These RWST parameters are in effect prior to leaving the cold shutdown condition for Unit 1 (following U1R24) and for Unit 2 (following U2R23). Prior to U2R23, the Unit 2 minimum RWST volume and boron concentration for this basis statement is 24,100 gallons and 2000 ppm respectively.

Table 15.3.2-1

Boric Acid Storage Tank(s)

Minimum Volume/Temperature/Concentration

Boric Acid Soln Concentration (Wt%)	Minimum Combined Volume (Gal.)[1]	Minimum Temperature (°F)
3.00 to <3.50	~~6860~~7950[2]	56.0
3.50 to <4.00	~~5870~~6740[2]	62.5
4.00 to <4.50	~~5120~~5850[2]	69.5
4.50 to <5.50	~~4550~~[3] 5180[2]	85.0
5.50 to <6.50	~~3700~~4210[3]	97.0
6.50 to <7.50	~~3150~~3550[3]	107.0
7.50 to <8.50	~~2720~~3070[3]	116.0
8.50 to <9.50	~~2390~~2710[3]	123.5
9.50 to <10.50	~~2140~~2420	131.0
10.50 to <11.50	~~1930~~2190	138.0
11.50 to ≤12.50	~~1750~~2000	145.0

(1) Per unit relying on BAST(s) as source of borated water.
(2) Requires more than one BAST per unit.
(3) Requires more than one BAST for two units combined.

15.3.3 EMERGENCY CORE COOLING SYSTEM, AUXILIARY COOLING SYSTEMS, AIR RECIRCULATION FAN COOLERS, AND CONTAINMENT SPRAY

Applicablity:

Applies to the operating status of the Emergency Core Cooling System, Auxiliary Cooling Systems, Air Recirculation Fan Coolers, and Containment Spray.

Objective:

To define those limiting conditions for operation that are necessary: (1) to remove decay heat from the core in emergency or normal shutdown situations, (2) to remove heat from containment in normal operating and emergency situations, and (3) to remove airborne iodine from the containment atmosphere following a postulated Design Basis Accident.

Specification:

A. Safety Injection and Residual Heat Removal Systems

1. A reactor shall not be made critical, except for low temperature physics tests, unless the following conditions associated with that reactor are met:

   a. The refueling water tank contains not less than 275,000 gal. of water with a boron concentration of at least ~~2000~~ 2700 ppm.*

   b. Each accumulator is pressurized to at least 700 psig and contains at least 1100 ft^3 but no more than 1136 ft^3 of water with a boron concentration of at least ~~2000~~ 2600 ppm.** Neither accumulator may be isolated.

   c. Two safety injection pumps are operable.

   d. Two residual heat removal pumps are operable.

   e. Two residual heat exchangers are operable.

* This value is in effect prior to leaving the cold shutdown condition for Unit 1 (following U1R24) and for Unit 2 (following U2R23). Prior to U2R23, the Unit 2 minimum RWST boron concentration is 2000 ppm.

** This value is in effect prior to leaving the cold shutdown condition for Unit 1 (following U1R24) and for Unit 2 (following U2R23). Prior to U2R23, the Unit 2 minimum SI accumulator concentration is 2000 ppm.

B. Internal Pressure

1. If the internal pressure exceeds 3 psig or the internal vacuum exceeds 2.0 psig, the condition shall be corrected within one hour.

2. If the above action cannot be completed within the time specified, place the affected unit in:

   a. hot shutdown within six hours,

      AND

   b. cold shutdown within 36 hours.

C. Positive reactivity changes shall not be made by rod drive motion when the containment integrity is not intact except for the testing of one bank of rods at a time, rod disconnecting, and rod reconnecting provided the reactor is initially subcritical by at least 5% $\Delta k/k$.

D. Positive reactivity changes shall not be made by boron dilution when the containment integrity is not intact unless the boron concentration in the reactor is maintained > ~~1800~~ 2100 ppm.

experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

Specifications 15.3.6.C. and D.

The shutdown conditions of the reactor are selected based on the type of activities that are being carried out. When the reactor head is not to be removed, the specified cold shutdown margin of 1% Δk/k precludes criticality under any occurrence. During refueling the reactor is subcritical by 5% Δk/k. Positive reactivity changes for the purpose of rod assembly testing will not result in criticality because no control bank worth exceeds 3%. Positive reactivity changes by boron dilution may be required or small concentration fluctuations may occur during preparation for, recovery from, or during refueling but maintaining the boron concentration greater than ~~1800~~ 2100 ppm precludes criticality under these circumstances. ~~1800~~ 2100 ppm is a nominal value that ensures 5% shutdown for typical reload cores. Should continuous dilution occur, the time intervals for this incident are discussed in Section 14.1.~~5~~4 of the FSAR.

References

(1) FSAR - Section 5.1.1

(2) FSAR - Section 14.3.4

(3) FSAR - Section 5.5.2

15.3.8 REFUELING

Applicability:

Applies to operating limitations during refueling operations.

Objective:

To ensure that no incident could occur during refueling operations that would affect public health and safety.

Specifications:

During refueling operations:

1. The equipment hatch shall be closed and the personnel locks shall be capable of being closed. A temporary third door on the outside of the personnel lock shall be in place whenever both doors in a personnel lock are open (except for initial core loading).
2. Radiation levels in fuel handling areas, the containment and spent fuel storage pool shall be monitored continuously.
3. Core subcritical neutron flux shall be continuously monitored by at least two neutron monitors, each with continuous visual indication in the control room and one with audible indication in the containment available whenever core geometry is being changed. When core geometry is not being changed, at least one neutron flux monitor shall be in service.
4. At least one residual heat removal loop shall be in operation. However, if refueling operations are affected by the residual heat removal loop flow, the operating residual heat removal loop may be removed from operation for up to one hour per eight hour period.
5. During reactor vessel head removal and while loading and unloading fuel from the reactor, a minimum boron concentration of ~~1800~~ 2100 ppm shall be maintained in the primary coolant system.
6. Direct communication between the control room and the operating floor of the containment shall be available whenever changes in core geometry are taking place.