

## Bases

The high pressure injection system and chemical addition system provide control of the reactor coolant system boron concentration.(1) This is normally accomplished by using any of the three high pressure injection pumps in series with a boric acid pump associated with either the boric acid mix tank or the concentrated boric acid storage tank. An alternate methods of boration will be the use of the high pressure injection pumps taking suction directly from the borated water storage tank.(2)

The quantity of boric acid in storage in the concentrated boric acid storage tank or the borated water storage tank is sufficient to borate the reactor coolant system to a 1%  $\Delta k/k$  subcritical margin at cold conditions (70°F) with the maximum worth stuck rod and no credit for xenon at the worst time in core life. The current cycles for each unit were analyzed with the most limiting case selected as the basis for all three units. Since only the present cycles were analyzed, the specifications will be re-evaluated with each reload. A minimum of 1020 ft<sup>3</sup> of 11,000 ppm boric acid in the concentrated boric acid storage tank, or a minimum of 350,000 gallons of 1835\* ppm boric acid in the borated water storage tank (3) will satisfy the requirements. The volume requirements include a 10% margin and, in addition, allow for a deviation of 10 EFPD in the cycle length. The specification assures that two supplies are available whenever the reactor is critical so that a single failure will not prevent boration to a cold condition. The required amount of boric acid can be added in several ways. Using only one 10 gpm boric acid pump taking suction from the concentrated boric acid storage tank would require approximately 12.7 hours to inject the required boron. An alternate method of addition is to inject boric acid from the borated water storage tank using the makeup pumps. The required boric acid can be injected in less than six hours using only one of the makeup pumps.

The concentration of boron in the concentrated boric acid storage tank may be higher than the concentration which would crystallize at ambient conditions. For this reason, and to assure a flow of boric acid is available when needed, these tanks and their associated piping will be kept at least 10°F above the crystallization temperature for the concentration present. The boric acid concentration of 11,000 ppm in the concentrated boric acid storage tank corresponds to a crystallization temperature of 88°F and therefore a temperature requirement of 98°F. Once in the high pressure injection system, the concentrate is sufficiently well mixed and diluted so that normal system temperatures assure boric acid solubility.

## REFERENCES

- (1) FSAR, Sections 9.3.1, and 9.3.2
- (2) FSAR, Figure 6.0.2
- (3) Technical Specification 3.3

\* 2010 ppm boron for Unit 3, Cycle 10 only.

- b. The BWST shall contain a minimum level of 46 feet of water having a minimum concentration of 1835\* ppm boron at a minimum temperature of 50°F. The manual valve, LP-28, on the discharge line shall be locked open. If these requirements are not met, the BWST shall be considered unavailable and action initiated in accordance with Specification 3.2.

### 3.3.5 Reactor Building Cooling (RBC) System

- a. Prior to initiating maintenance on any component of the RBC system, the redundant component shall be tested to assure operability.
- b. When the RCS, with fuel in the core, is in a condition with pressure equal to or greater than 350 psig or temperature equal to or greater than 250°F and subcritical:
  - (1) Two independent RBC trains, each comprised of an RBC fan, associated cooling unit, and associated ESF valves shall be operable.
  - (2) Tests or maintenance shall be allowed on any component of the RBC system provided one train of the RBC and one train of the RBS are operable. If the RBC system is not restored to meet the requirements of Specification 3.3.5b(1) above within 24 hours, the reactor shall be placed in a condition with RCS pressure below 350 psig and RCS temperature below 250°F within an additional 24 hours.
- c. When the reactor is critical:
  - (1) In addition to the requirements of Specifications 3.3.5.b(1) above, the remaining RBC fan, associated cooling unit, and associated ESF valves shall be operable.
  - (2) Tests or maintenance shall be allowed on one RBC train under either of the following conditions:
    - (a) One RBC train may be out of service for 24 hours.
    - (b) One RBC train may be out of service for 7 days provided both RBS trains are operable.
    - (c) If the inoperable RBC train is not restored to meet the requirements of Specification 3.3.5.c(1) within the time permitted by Specification 3.3.5.c(2) (a) or (b), the reactor shall be placed in a hot shutdown condition within 12 hours. If the requirements of Specification 3.3.5.c(1) are not met within an additional 24 hours following hot shutdown, the reactor shall be placed in a condition with RCS pressure below 350 psig and RCS temperature below 250°F within an additional 24 hours.

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Three-hundred and fifty thousand (350,000) gallons of borated water ( a level of 46 feet in the BWST) are required to supply emergency core cooling and reactor building spray in the event of a loss-of-core cooling accident. This amount fulfills requirements for emergency core cooling. The borated water storage tank capacity of 388,000 gallons is based on refueling volume requirements. Heaters maintain the borated water supply at a temperature above 50°F to lessen the potential for thermal shock of the reactor vessel during high pressure injection system operation. The boron concentration is set at the amount of boron required to maintain the core 1 percent subcritical at 70°F without any control rods in the core. The minimum value specified in the tanks is 1835\* ppm boron.

It has been shown for the worst design basis loss-of-coolant accident (a 14.1 ft<sup>2</sup> hot leg break) that the Reactor Building design pressure will not be exceeded with one spray and two coolers operable. (4) Therefore, a maintenance period of seven days is acceptable for one Reactor Building cooling fan and its associated cooling unit provided two Reactor Building spray systems are operable for seven days or one Reactor Building spray system provided all three Reactor Building cooling units are operable.

Three low pressure service water pumps serve Oconee Units 1 and 2 and two low pressure service water pumps serve Oconee Unit 3. There is a manual cross-connection on the supply headers for Unit 1, 2, and 3. One low pressure service water pump per unit is required for normal operation. The normal operating requirements are greater than the emergency requirements following a loss-of-coolant accident.

Prior to initiating maintenance on any of the components, the redundant component(s) shall be tested to assure operability. Operability shall be based on the results of testing as required by Technical Specification 4.5. The maintenance period of up to 24 hours is acceptable if the operability of equipment redundant to that removed from service is demonstrated within 24 hours prior to removal. The 24 hour period prior to removal is adequate to permit efficient scheduling of manpower and equipment testing while ensuring that the testing is performed directly prior to removal. The basis of acceptability is the low likelihood of failure within a clearly defined 48 hours following redundant component testing.

#### REFERENCES

- (1) ECCS Analysis of B&W's 177-FA Lowered-Loop NSS, BAW-10103, Babcock & Wilcox, Lynchburg, Virginia, June 1975.
- (2) Duke Power Company to NRC letter, July 14, 1978, "Proposed Modifications of High Pressure Injection System".
- (3) FSAR, Section 9.3.3.2
- (4) FSAR, Section 15.14.5

\* 2010 ppm boron for Unit 3, Cycle 10 only.

These procedures, the above specifications, and the design of the fuel handling equipment as described in Section 9.1.4 of the FSAR incorporating built-in interlocks and safety features, provide assurance that no incident could occur during the refueling operations that would result in a hazard to public health and safety. If no change is being made in core geometry, one flux monitor is sufficient. This permits maintenance on the instrumentation.

Continuous monitoring of radiation levels and neutron flux provides immediate indication of an unsafe condition. The low pressure injection pump is used to maintain a uniform boron concentration. (1) The shutdown margin indicated in Specification 3.8.4 will keep the core subcritical, even with all control rods withdrawn from the core. (2) The bore concentration will be maintained above 1835\* ppm. Although this concentration is sufficient to maintain the core  $K_{eff} \leq 0.99$  if all the control rods were removed from the core, only a few control rods will be removed at any one time during fuel shuffling and replacement. The  $K_{eff}$  with all rods in the core and with refueling boron concentration is approximately 0.90. Specification 3.8.5 allows the control room operator to inform the reactor building personnel of any impending unsafe condition detected from the main control board indicators during fuel movement.

The specification requiring testing of the Reactor Building purge isolation is to verify that these components will function as required should a fuel handling accident occur which resulted in the release of significant fission products.

Specification 3.8.11 is required, as the safety analysis for the fuel handling accident was based on the assumption that the reactor had been shutdown for 72 hours.(3)

The off-site doses for the fuel handling accident are within the guidelines of 10 CFR 100; however, to further reduce the doses resulting from this accident, it is required that the spent fuel pool ventilation system be operable whenever the possibility of a fuel handling accident could exist.

Specification 3.8.13 is required as the safety analysis for a postulated cask handling accident was based on the assumptions that spent fuel stored as indicated has decayed for the amount of time specified for each spent fuel pool.

Specification 3.8.14 is required to prohibit transport of loads greater than a fuel assembly with a control rod and the associated fuel handling tool(s).

#### REFERENCES

- (1) FSAR, Section 9.1.4
- (2) FSAR, Section 15.11.1
- (3) FSAR, Section 15.11.2.1

\* 2010 ppm boron for Unit 3, Cycle 10 only.

Duke Power Company  
Oconee Nuclear Station

Attachment 2

No Significant Hazards Consideration Evaluation

No Significant Hazards Consideration Evaluation  
Oconee 3, Cycle 10 BWST Boron Concentration

Duke Power has determined that this amendment request poses no significant hazards as defined by NRC regulations in 10 CFR 50.92. This ensures that operation of the facility in accordance with the proposed amendment would not:

- (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or
- (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or
- (3) involve a significant reduction in a margin of safety.

The commission has provided guidelines pertaining to the application of the three standards by listing specific examples in 48 FR 14870. Example (ii) of amendments that are considered not likely to involve significant hazards considerations applies in that increasing the Unit 3, Cycle 10 minimum Borated Water Storage Tank (BWST) boron concentration from 1835 ppm to 2010 ppm constitutes an additional restriction where 1873 ppm meets all applicable criteria. Example (i) applies inasmuch as the deletion of the expired footnote from T.S. 3.3.5 is a purely administrative change.

The following evaluation measures aspects of this amendment request against the 50.92(c) requirements to demonstrate that all three standards are satisfied.

First Standard

(Amendment would not) involve a significant increase in the probability or consequences of an accident previously evaluated.

Each accident analysis addressed in the Oconee Final Safety Analysis Report (FSAR) has been examined with respect to the increase in the Unit 3, Cycle 10 minimum BWST boron concentration. BWST boron concentration is required to be maintained such that the core will remain 1 percent subcritical at 70°F with all control rods removed. This concentration applies to LOCA and refueling conditions. As such, since a boron concentration of 1873 ppm will meet this criteria, the proposed 2010 ppm concentration is conservative. Therefore, the probability of any Design Basis Accident (DBA) is not affected by this change, nor are the consequences of a DBA affected by this change.

The deletion of an expired footnote from T.S. 3.3.5 is a purely administrative change and, as such will not involve a significant increase in the probability or consequences of previously evaluated accidents.

Second Standard

(Amendment would not) create the possibility of a new or different kind of accident from any accident previously evaluated.

Analysis of the increase in the Unit 3 Cycle 10 minimum BWST boron concentration has indicated that the 2010 ppm concentration is well within all acceptance criteria. For refueling and LOCA conditions the proposed concentration is sufficient to maintain the core 1 percent subcritical at 70°F with all control rods removed. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

Third Standard

(Amendment would not) involve a significant reduction in a margin of safety.

The proposed value for Unit 3, Cycle 10 minimum BWST boron concentration has been set at 2010 ppm. The minimum value required to meet all acceptance criteria is 1873 ppm, as such, there will be no reduction to any margin of safety due to this change.

The deletion of an expired footnote from T.S. 3.3.5 will have no effect on any margin of safety.

The above evaluation shows that the three Part 50.92 (c) standards are satisfied. In summary, Duke has determined and submits that the proposed changes described herein do not represent any significant hazards.