BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.8 Each of the following borated water sources shall be OPERABLE:

a. A boric acid storage system and associated heat tracing with:

1. A minimum contained borated water volume of [illegible] gallons, → 4905

2. Between 20,000 and 22,500 ppm of boron, and

3. A minimum solution temperature of 145°F.

b. The refueling water storage tank with:

1. A minimum contained borated water volume of 350,000 gallons of water,

2. Between 2400 and 2600 ppm of boron, and

3. A minimum solution temperature of 80°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the boric acid storage system inoperable, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% Delta k/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the refueling water storage tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.8 Each borated water source shall be demonstrated OPERABLE:

BASES

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The limitation for maximum of one centrifugal charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps and safety injection pumps, except the required OPERABLE charging pump, to be inoperable below 152°F, unless the reactor vessel head is removed, provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

The boration capability of either system is sufficient to provide the required SHUTDOWN MARGIN from expected operating conditions after xenon decay and cooldown to 200°F. The maximum expected boration capability usable volume requirement is [redacted] gallons of 20,000 ppm borated water from the boric acid storage tanks or 160,122 gallons of borated water from the refueling water storage tank. The required RWST volume is based on an assumed boron concentration of 2400 ppm. The minimum RWST boron concentration required by the post-LOCA long-term cooling analysis is 2400 ppm. The minimum contained RWST volume is based on ECCS considerations. See Section B 3/4.5.5.

With the RCS average temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

The boron capability required below 200°F is sufficient to provide the required MODE 5 SHUTDOWN MARGIN after xenon decay and cooldown from 200°F to 140°F. This condition requires usable volumes of either 4300 gallons of 20,000 ppm borated water from the boric acid storage tanks or 90,000 gallons of borated water from the refueling water storage tank. The value for the boric acid storage tank volume includes sufficient boric acid to borate to 2190 ppm. The required RWST volume is based on an assumed boron concentration of 2400 ppm. The minimum RWST boron concentration required by the post-LOCA long-term cooling analysis is 2400 ppm.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.6 and 9.5 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

The OPERABILITY of boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

ATTACHMENT 2 TO AEP:NRC:1139

10 CFR 50.92 ANALYSIS FOR

CHANGES TO THE DONALD C. COOK NUCLEAR PLANT

UNIT 2 TECHNICAL SPECIFICATIONS

Introduction

The revised T/Ss requirement for the Modes 1 through 4 BAST volume results from a recalculation performed for us by Westinghouse to cover the boron concentration requirements specific to Cycle 8 and to provide conservative margin for future cycles. This recalculation employed more accurate boron concentration data than the calculation which supports the currently approved value.

The above noted change will require T/Ss pages 3/4 1-16 and B 3/4 1-3 to be revised. Specifically, on page 3/4 1-16, the old BAST volume requirement of "7715 gallons" should be replaced by the new limit of "5650 gallons." This value bounds the newly calculated limit of "4905 gallons." On page B 3/4 1-3, the volume of "7715 gallons" in the BAST and the volume of "160,122 gallons" in the RWST should be replaced by the volumes of "4905 gallons" and "69,215 gallons," respectively, which were calculated by our contractor (i.e., Westinghouse). The proposed bases are also elaborated to explain that the T/S BAST volume is set at "5650 gallons" to be consistent with Unit 1. The proposed bases for the Modes 5 and 6 BAST and RWST volume requirements are also clarified.

Justification for Request and Significant Hazards Considerations

We believe that operating with the revised boric acid storage tank volume will not adversely impact public health and safety.

10 CFR 50.92 Criteria

Per 10 CFR 50.92, a proposed amendment will not involve a significant hazards consideration if the proposed amendment does not:

1) involve a significant increase in the probability or consequences of an accident previously analyzed,

2) create the possibility of a new or different kind of accident from an accident previously analyzed or evaluated, or

3) involve a significant reduction in a margin of safety.

Our evaluation of the proposed change with respect to these criteria is provided below.

Criterion 1

At our request, Westinghouse recalculated the minimum boration volume required to cooldown from Mode 1 to Mode 4 with revised final boron concentration assumptions. These calculations have been performed using boron concentration data which results from more detailed core models and which is more accurate than that employed in the original calculation of the boric acid storage tank minimum volume requirement for Unit 2 Cycle 8 operation. The results of this calculation justified a minimum boration volume of 4905 gallons. To achieve consistency between the Unit 1 and Unit 2 technical specifications, and to be conservative, we are requesting that the minimum boration volume required by T/S 3.1.2.8 equal 5650 gallons. To reflect the results of the revised calculation, we are also requesting that the maximum expected boration capability usable volume requirement from the RWST be reduced from "160,122 gallons"[1] to "69,215 gallons" in the bases T/S on page B 3/4 1-3; however, no change to the limiting condition for operation for the RWST (i.e., T/S 3.1.2.8.b) is being requested here. Therefore, we have concluded that the above changes represent the application of a refinement to a previously used calculation model or design method, and do not result in a significant increase in the probability or consequences of an accident previously analyzed.

Criterion 2

As noted in Criterion 1, Westinghouse recalculated the minimum boration volume required to cooldown from Mode 1 to Mode 4 with revised final boron concentration assumptions and with boron concentration data that is more accurate than that employed in the original calculation for Unit 2 Cycle 8 operation. It is expected that the boron concentration ranges assumed for the determination of the minimum boration volume requirements for Modes 1 through 4 can bound future cycles of operation of the Donald C. Cook Nuclear Plant Unit 2. Other than the reduction in the minimum BAST boration volume alarm setpoint, no physical modifications to the plant are involved with this technical specification change request. Therefore, since the above changes only represent the application of a refinement to a previously used calculation model or design method, we have concluded that the changes do not create the possibility of a new or different kind of accident from any previously analyzed or evaluated.

Criterion 3

The changes proposed in this submittal are a result of Westinghouse's recalculation of the minimum boration volume requirements to cooldown from Mode 1 to Mode 4 with revised final boron concentration assumptions. The BORDER computer code was used to perform the calculation. The BORDER code, developed by the Westinghouse Commercial Nuclear Fuels Division, performs calculations which determine if boron requirements dictated by fuel reload design are within existing limits specified in the Technical Specifications and the FSAR. This calculation was also performed using boron concentration data that is more accurate than that employed in the previous Unit 2 Cycle 8 calculation and, therefore, does not involve a significant reduction in the margin of safety. For this reason, we believe the example cited above is relevant and conclude that the changes do not involve significant hazards considerations, which is consistent with previous NRC actions on applications of this type.

The Commission has provided guidance concerning the determination of significant hazards by providing certain examples (48 FR 14870) of amendments considered not likely to involve significant hazards considerations. The sixth of these examples refers to relief granted for changes resulting from the application of a refinement of a previously used calculation model or design method.

ATTACHMENT 3 TO AEP:NRC:1139

PROPOSED REVISED TECHNICAL SPECIFICATION PAGES

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.8 Each of the following borated water sources shall be OPERABLE:

a. A boric acid storage system and associated heat tracing with:

1. A minimum contained borated water volume of 5650 gallons,

2. Between 20,000 and 22,500 ppm of boron, and

3. A minimum solution temperature of 145°F.

b. The refueling water storage tank with:

1. A minimum contained borated water volume of 350,000 gallons of water,

2. Between 2400 and 2600 ppm of boron, and

3. A minimum solution temperature of 80°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the boric acid storage system inoperable, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% Delta k/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the refueling water storage tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.8 Each borated water source shall be demonstrated OPERABLE:

3/4.1 REACTIVITY CONTROL SYSTEMS BASES

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The limitation for maximum of one centrifugal charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps and safety injection pumps, except the required OPERABLE charging pump, to be inoperable below 152°F, unless the reactor vessel head is removed, provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

The boration capability of either system is sufficient to provide the required SHUTDOWN MARGIN from expected operating conditions after xenon decay and cooldown to 200°F. The maximum expected boration capability usable volume requirement is 4905 gallons of 20,000 ppm borated water from the boric acid storage tanks or 69,215 gallons of borated water from the refueling water storage tank. The required RWST volume is based on an assumed boron concentration of 2400 ppm. The minimum RWST boron concentration required by the post-LOCA long-term cooling analysis is 2400 ppm. The minimum contained RWST volume is based on ECCS considerations. See Section B 3/4.5.5. The boration source volume from the boric acid storage tanks has conservatively been increased to 5650 gallons. This value was chosen to be consistent with Unit 1.

With the RCS average temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

The boron capability required below 200°F is sufficient to provide the required MODE 5 SHUTDOWN MARGIN after xenon decay and cooldown from 200°F to 140°F. This condition requires usable volumes of either 298 gallons of 20,000 ppm borated water from the boric acid storage tanks or 2408 gallons of borated water from the refueling water storage tank. The boration source volumes of Technical Specification 3.1.2.7 have been conservatively increased to 4300 gallons from the boric acid storage tanks and 90,000 gallons from the refueling water storage tank. These volumes are based on conservative calculations performed for Cycle 6 of Unit 2. The calculations assumed a final MODE 6 RCS boron concentration of 2000 ppm.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.6 and 9.5 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

The OPERABILITY of boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

ATTACHMENT 4 TO AEP:NRC:1139

EXISTING TECHNICAL SPECIFICATIONS PAGES
MARKED-UP TO REFLECT PROPOSED CHANGES

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.8 Each of the following borated water sources shall be OPERABLE:

a. A boric acid storage system and associated heat tracing with:

1. A minimum contained borated water volume of 7725 gallons,

2. Between 20,000 and 22,500 ppm of boron, and

3. A minimum solution temperature of 145°F.

5650

b. The refueling water storage tank with:

1. A minimum contained borated water volume of 350,000 gallons of water,

2. Between 2400 and 2600 ppm of boron, and

3. A minimum solution temperature of 80°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the boric acid storage system inoperable, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% Delta k/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the refueling water storage tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.8 Each borated water source shall be demonstrated OPERABLE:

(A) The boration source volume from the boric acid storage tanks has conservatively been increased to 5650 gallons. This value was chosen to be consistent with Unit-1.

BASES

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The limitation for maximum of one centrifugal charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps and safety injection pumps, except the required OPERABLE charging pump, to be inoperable below 152°F, unless the reactor vessel head is removed, provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

The boration capability of either system is sufficient to provide the required SHUTDOWN MARGIN from expected operating conditions after xenon decay and cooldown to 200°F. The maximum expected boration capability usable volume requirement is 7715 gallons of 20,000 ppm borated water from the boric acid storage tanks or 160,122 gallons of borated water from the refueling water storage tank. The required RWST volume is based on an assumed boron concentration of 2400 ppm. The minimum RWST boron concentration required by the post-LOCA long-term cooling analysis is 2400 ppm. The minimum contained RWST volume is based on ECCS considerations. ~~See Section B 3/4.5.5.~~ Insert (A)

4905

69,215

With the RCS average temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

The boron capability required below 200°F is sufficient to provide the required MODE 5 SHUTDOWN MARGIN after xenon decay and cooldown from 200°F to 140°F. This condition requires usable volumes of either 4300 gallons of 20,000 ppm borated water from the boric acid storage tanks or 90,000 gallons of borated water from the refueling water storage tank. The value for the boric acid storage tank volume includes sufficient boric acid to borate to 2190 ppm. The required RWST volume is based on an assumed boron concentration of 2400 ppm. The minimum RWST boron concentration required by the post-LOCA long-term cooling analysis is 2400 ppm. Insert (B)

298

2406

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.6 and 9.5 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

The OPERABILITY of boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

The boration source volumes of Technical Specification 3.1.2.7 have been conservatively increased to 4300 gallons from the boric acid storage tanks and 90,000 gallons from the refueling water storage tank. These volumes are based on conservative calculations performed for Cycle 6 of Unit 2. The calculations assumed a final Mode 6 RCS boron concentration of 2000 ppm