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SUBJECT: Application for amends to licenses DPR-58 & DPR-74,revising ~~Reports~~ See Proposed change TS to reduce boric acid concentration in boric acid storage sys from approx 12 percent to approx 4 percent by weight. To Tech Spec Technical rept presenting justificaion for changes encl.

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February 29, 1996

AEP:NRC:1232

Docket Nos.: 50-315
50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Donald C. Cook Nuclear Plant Units 1 and 2
TECHNICAL SPECIFICATION CHANGE REQUEST:
BORIC ACID STORAGE SYSTEM BORON CONCENTRATION REDUCTION

This letter and its attachments constitute an application for amendment to Donald C. Cook Nuclear Plant Units 1 & 2 technical specifications (T/Ss). The proposed change will reduce the boric acid concentration in the boric acid storage system from approximately 12 percent to approximately 4 percent by weight. The high boric acid concentration presently creates several operational problems. The high boric acid concentration causes accelerated Boric Acid Transfer pump seal wear which requires additional maintenance. The heat tracing associated with the high boric acid concentration also contributes to higher maintenance requirements through temperature degradation of the diaphragm valves. In addition, the heat tracing system itself requires significant maintenance to keep it fully operational and much of this activity results in radiation exposure to the maintenance personnel.

Specifically, we propose to modify T/Ss 3.1.2.7 and 3.1.2.8 such that the minimum required usable borated water volume in the boric acid storage system is increased and the maximum boron concentration is decreased. A related proposal is also made to increase the minimum required flow rate in action statements for T/Ss 3.1.1.1, 3.1.1.2, 3.9.1, and 3.10.1 and add an additional surveillance requirement for this flow rate in T/S 4.1.2.2.d. Finally, it is proposed that the minimum temperature requirement in T/Ss 4.1.2.1.a, 4.1.2.2.a, 3.1.2.7.a.3, and 3.1.2.8.a.3 be decreased to 63°F. The bases section 3/4.1.2 is also updated to reflect these changes.

A description of the proposed changes and analysis concerning significant hazards consideration pursuant to 10 CFR 50.92 are contained in Attachment 1. Attachment 2 contains the existing T/S pages marked to reflect proposed changes. Attachment 3 contains

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the proposed, revised T/S pages. The justifications for the proposed changes are presented in Attachment 4.

Implementation of the reduced boron concentration for both units will not be accomplished until plant modifications are complete. Therefore, a period of one year from the approval date is requested to implement the T/S changes. Units 1 and 2 will reduce boron concentration while in an operational mode. Please note that the proposed T/S changes are similar to those approved for Sequoyah Nuclear Plant and Salem Nuclear Generating Station.

Our letter AEP:NRC:1207, which has previously been submitted for approval, proposes to change the shutdown margin requirement for modes 1 through 4 and also proposes to change the minimum temperature of the borated water in the refueling water storage tank (RWST). This submittal reflects the current shutdown margin and minimum RWST borated water temperature requirements.

We believe that the proposed T/S changes will not result in (1) a significant change in the amount of effluent that may be released off site, or (2) a significant increase in individual or cumulative occupational radiation exposure.

These proposed T/S changes have been reviewed and approved by the Plant Nuclear Safety Review Committee and by the Nuclear Safety and Design Review Committee.

In compliance with the requirements of 10 CFR 50.91(b)(1), copies of this letter and its attachments have been transmitted to the Michigan Public Service Commission and the Michigan Department of Public Health.

Sincerely,

for W. G. Smith

E. E. Fitzpatrick
Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 29th DAY OF February 1996

Rita D Lee
Notary Public

My Commission Expires: 6-28-99

eh

Attachments

cc: A. A. Blind
G. Charnoff
H. J. Miller
NFEM Section Chief
NRC Resident Inspector - Bridgman
J. R. Padgett

ATTACHMENT 1 TO AEP:NRC:1232

DESCRIPTION OF PROPOSED TECHNICAL SPECIFICATION CHANGES AND 10 CFR 50.92 SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS

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DESCRIPTION OF CHANGES IN TECHNICAL SPECIFICATIONS (both units)

1. Action statement for T/S 3.1.1.1 (page 3/4 1-1) is changed to increase the required rate of boration to 34 gpm and decrease the required boron concentration of the solution to 6,550 ppm.

2. Action statement for T/S 3.1.1.2 (page 3/4 1-3) is changed to increase the required rate of boration to 34 gpm and decrease the required boron concentration of the solution to 6,550 ppm.

3. Surveillance requirement T/S 4.1.2.1.a (page 3/4 1-7 for Unit 1 and page 3/4 1-8 for Unit 2) is changed to decrease the required temperature to 63°F. It is also proposed that the temperature measurements be made of the physical plant areas containing the components of the flow path from the boric acid tank to the blending tee rather than the temperature of the flow path itself. The reference to the heat tracing system is removed. These changes are proposed because the heat tracing system is not needed to operate with lower boric acid storage tank boron concentrations.

4. Surveillance requirement T/S 4.1.2.2.a (page 3/4 1-9) is changed to decrease the required temperature to 63°F. It is also proposed that the temperature measurements be made of the physical plant areas containing the components of the flow path from the boric acid tank to the blending tee rather than the temperature of the flow path itself. The reference to the heat tracing system is removed. These changes are proposed because the heat tracing system is not needed to operate with lower boric acid storage tank boron concentrations.

5. Surveillance requirement T/S 4.1.2.2.d (page 3/4 1-10) is added which requires verification of the flow rate of the flow path from the boric acid storage tank (BAST), which is required by T/S 3.1.2.2.a. The flow verification is to be performed once per 18 months during shutdown.

6. T/S 3.1.2.7.a (page 3/4 1-15) is changed to eliminate the reference to the heat tracing system.

7. T/S 3.1.2.7.a.1 (page 3/4 1-15) is changed to increase the minimum usable borated water volume to 5,000 gallons.

8. T/S 3.1.2.7.a.2 (page 3/4 1-15) is changed to establish required boron concentration in the boric acid storage system between 6,550 ppm and 6,990 ppm.

9. T/S 3.1.2.7.a.3 (page 3/4 1-15) is changed to establish minimum solution temperature of 63°F which is consistent with the new boron concentration specified in item 8 above.

10. T/S 3.1.2.8.a (page 3/4 1-16) is changed to eliminate the reference to the heat tracing system.

11. T/S 3.1.2.8.a.1 (page 3/4 1-16) is changed to increase the minimum usable borated water volume to 8,500 gallons. A note "Not required when borated water is injected into the RCS to meet SHUTDOWN MARGIN requirements of MODES 3 and 4." was added to allow using this borated water for core boration after shutdown. Once the borated water is used for the intended purpose of increasing the RCS boron concentration, then no additional volume is required.

12. T/S 3.1.2.8.a.2 (page 3/4 1-16) is changed to establish required boron concentration in the boric acid storage system between 6,550 ppm and 6,990 ppm.

13. T/S 3.1.2.8.a.3 (page 3/4 1-16) is changed to establish minimum solution temperature of 63°F which is consistent with the new boron concentration specified in item 12 above.

14. Action Statement for T/S 3.9.1 (page 3/4 9-1) is changed to increase the minimum required rate of boration to 34 gpm and decrease the required boron concentration of the solution to 6,550 ppm.

15. Action statement a. and action statement b. for T/S 3.10.1 (page 3/4 10-1) are changed to increase the minimum required rate of boration to 34 gpm and decrease the required boron concentration of the solution to 6,550 ppm.

DESCRIPTION OF CHANGES IN THE BASES (Unit 1)

16. The following changes are proposed for the BASES for T/S 3/4.1.2 BORATION SYSTEMS (pages 3/4 1-2 and 3/4 1-3):

16.1 The words "5) associated heat tracing systems" were removed from the list of components required to perform boron injection. The numbering in the list of components was adjusted. This change is required because there will be no need for the heat tracing system with the reduced boron concentration in the boric acid storage system.

16.2 The statement "The maximum expected boration capability, usable volume requirement, is 5641 gallons of 20,000 ppm borated water from the boric acid storage tanks or 99,598 gallons of 2400 ppm borated water from the refueling water storage tank." in the last paragraph on page B 3/4 1-2 was changed to "The maximum expected boration capability, usable volume requirement, is 8500 gallons of 6550 ppm borated water from the boric acid storage tanks for providing required SHUTDOWN MARGIN after xenon decay and cooldown to 547°F and additional borated water from a second boric acid storage tank, or batching tank, or refueling water storage tank for further cooldown to 200°F. With the refueling water storage tank as the only source, based on conservative calculations, a maximum of 99598 gallons of 2400 ppm borated water is required."

16.3 The statement "This condition requires either 2890 gallons of 20,000 ppm borated water from the boric acid storage tanks or 76,937 gallons of 2400 ppm borated water from the refueling water storage tank." in the second paragraph on page B 3/4 1-3 was changed to "This condition requires either 900 gallons of 6,550 ppm borated water from the boric acid storage tanks or 3265 gallons of 2400 ppm borated water from the refueling water storage tank. The boric acid storage tank boration source volume of T/S 3.1.2.7 has been conservatively increased to 5,000 gallons."

DESCRIPTION OF CHANGES IN THE BASES (Unit 2)

17. The following changes are proposed for the BASES for T/S 3/4.1.2 BORATION SYSTEMS (pages B 3/4 1-2 and B 3/4 1-3):

17.1 The words "5) associated heat tracing systems" were removed from the list of components required to perform boron injection. The numbering in the list of components was adjusted. This change is required because there will be no need for the heat tracing system with the reduced boron concentration in the boric acid storage system.

17.2 The statement "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." in the third paragraph on page B 3/4 1-3 was changed to "The maximum expected boration capability usable volume requirement is 8500 gallons of 6550 ppm borated water from the boric acid storage tanks for providing required SHUTDOWN MARGIN after xenon decay and cooldown to 547°F and additional borated water from a second boric acid storage tank, or batching tank, or refueling water storage tank for further cooldown to 200°F. With the refueling water storage tank as the only source, based on conservative calculations, a maximum of 69215 gallons of 2400 ppm borated water is required."

17.3 The statement "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." at the end of the third paragraph on page B 3/4 1-3 were deleted. New analyses described in Attachment 4 were performed for both units. Therefore, the boration source volume for both units is the same.

17.4 The statements "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 T/S 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." in the fifth paragraph on page B 3/4 1-3 were changed to: "This condition requires usable volumes of either 900 gallons of 6,550 ppm borated water from the boric acid storage tanks or 3265 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 5,000 gallons from the boric acid storage tank and 90,000 gallons from the refueling water storage tank."

DESCRIPTION OF EDITING CHANGES IN TECHNICAL SPECIFICATIONS (both units)

1. Surveillance requirements T/Ss 4.1.2.2.b and 4.1.2.2.c were moved from page 3/4 1-10 to page 3/4 1-9

REASON FOR CHANGE

Because of the requirement to maintain highly concentrated boric acid in the boric acid storage system, the solution has to be kept at a high temperature of at least 145°F. This is accomplished by heat tracing all associated tanks and pipes. The high boric acid concentration presently creates several operational problems. The heat tracing requirements for the CVCS are extensive and require significant maintenance to keep the system operable. If a heat trace failure is undetected, the possibility of pipe blockage because of boric acid precipitation may render one of the flow paths inoperable, impacting the safety system availability. In addition, the heat tracing results in the degradation of the diaphragm valves associated with the boric acid system piping. The high boric acid concentration causes accelerated Boric Acid Transfer pump seal wear and can result in pump inoperability.

JUSTIFICATION FOR THE CHANGE

The boron concentration in the boric acid storage tank is not taken into consideration in any Chapter 14 FSAR accident analyses. The steam line break analysis assumed zero boron concentration in the boron injection tank. The boric acid storage tank boron concentration is also not considered in the LOCA analysis. Attachment 4 provides analysis supporting the boron reduction project. The investigation shows that safe shutdown will be achieved from all expected operational conditions.

10 CFR 50.92 SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS

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

1. involve a significant increase in the probability or consequences of an accident previously evaluated,

2. create the possibility of a new or different kind of

accident from any accident previously evaluated, and

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

Criterion 1

Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

NO. The BAST water volume and boron concentration were not credited in any Chapter 14 safety analysis. Therefore, no change in the probabilities of the accident analysis will result from the BAST water volume and boron concentration change. In addition, since the BAST water volume and boron concentration are not taken into consideration in any safety analysis, the consequences of an accident previously evaluated in the FSAR are not increased. The heat tracing system is currently only necessary to prevent precipitation of existing high boric acid concentration in the plant systems. The reduction in boron concentration in this proposal eliminates the need for the heat tracing system. The existence of the heat tracing system was not part of any safety analysis and disabling of the heat tracing system will not result in a significant increase in the probability or consequences of an accident previously evaluated.

Criterion 2

Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

NO. Since the minimum required water flow from the boric acid storage system to the reactor coolant system was increased to counteract any possible operational transients, as shown in Attachment 4, the change in BAST water volume and boron concentration and disabling of the heat tracing system do not create the possibility of an accident which is different from any already evaluated in the FSAR. No new or different failure modes have been defined for any system or component nor has any new limiting single failure been identified.

Criterion 3

Does the change involve a significant reduction in a margin of safety?

NO. The margin of safety requirements are not affected by the removal of the heat tracing system and the reduction of the boric acid concentration in the boric acid storage system. The required flow

paths and borated water sources are unaffected by this proposal. The required quantity of borated water is still available based upon the performed evaluation, and appropriate surveillance requirements ensure the ability to deliver this borated water. The reduction of the boric acid concentration in the BASTs will ensure that the boric acid remains in solution at the normal room temperature in the auxiliary building. With the above changes, there will be a net improvement in system reliability and accordingly the proposed changes do not affect the margin of safety.

Conclusion

It is concluded that operation of Cook Nuclear Plant Units 1 and 2 with a changed BAST water volume and boron concentration and disabled heat tracing system as described herein does not involve any significant hazards consideration as defined in 10 CFR 50.92.