February 2, 2001

MEMORANDUM TO: File

FROM: John G. Lamb, Project Manager, Section 1 ***/RA/***
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT 1 - ACCEPTANCE REVIEW REGARDING LICENSE AMENDMENT REQUEST, "TECHNICAL SPECIFICATION CHANGE REQUEST SPRAY ADDITIVE TANK MAXIMUM VOLUME AND SODIUM HYDROXIDE CONCENTRATION," DATED JANUARY 2, 2001 (TAC NO. MB0908)

During the review of the subject proposed license amendment, the Nuclear Regulatory Commission (NRC) staff determined additional information was necessary to complete its review. Attached is the draft request for additional information (RAI). In accordance with Nuclear Reactor Regulation (NRR) Office Letter 803, the draft RAI will be E-Mailed to the licensee and a conference call will be arranged to discuss the RAI. Once the NRC staff and the licensee have a common understanding of the information required, the RAI will be issued formally to the licensee.

Docket No. 50-315

Attachment: As Stated

ACCEPTANCE REVIEW FOR
D. C. COOK UNIT 1
SUBMITTAL C0101-05 TECHNICAL SPECIFICATION CHANGE REQUEST SPRAY ADDITIVE TANK MAXIMUM VOLUME AND SODIUM HYDROXIDE CONCENTRATION,"
DATED JANUARY 2, 2001

1. The submittal provided a statement that you determined the maximum allowed contained volume and sodium hydroxide concentration for the spray additive tank to support a bounding calculation of the maximum pH value for the containment spray solution and for the water contained in the containment recirculation sump under postulated accident conditions. You indicated that the analyses performed using the proposed Unit 1 maximum volume and sodium hydroxide concentrations verified that the acceptance criteria were satisfied for loss-of-coolant-accident (LOCA) events. However, the analyses were not provided for review, nor was a description of how the conclusion was reached.

   In order to begin our review, Nuclear Regulatory Commission (NRC) staff requests that you describe in detail and justify the analyses performed, the assumptions made in the analyses, and the results of the analyses.

2. Your Updated Final Safety Analysis Report (UFSAR), Section 6.3.1, "Design Bases - Containment Heat Removal Systems," states the following:

   "(Unit 1 only)

   The Containment Spray System is designed to deliver sufficient sodium hydroxide solution which, when mixed with water from the Refueling Water Storage Tank (RWST) which contains approximately 1.5 percent by weight boric acid (2000 ppm Boron), reactor coolant system water and the melted ice, gives a final spray water pH of approximately 9.3 after the spray additive sodium hydroxide (NaOH) tank is emptied."

   Does your bounding calculation assume 2,000 ppm of boron as stated in the UFSAR or does it use between 2,400 ppm and 2,600 ppm as stated in Technical Specification 3/4.5.5.b? Explain the discrepancy between the UFSAR and the Technical Specification? What is the range of pH in the injection mode using your bounding calculation? Justify your results.

3. Your UFSAR, Section 6.3.1, "Design Bases - Containment Heat Removal Systems," states the following:

   "(Unit 1 only)

   The Containment Spray System is designed to deliver sufficient sodium hydroxide solution which, when mixed with water from the Refueling Water Storage Tank (RWST) which contains approximately 1.5 percent by weight boric acid (2000 ppm Boron), reactor coolant system water and the melted ice, gives a final spray water pH of approximately 9.3 after the spray additive sodium hydroxide (NaOH) tank is emptied."

"(Unit 2 only)

The Containment Spray System is designed to deliver sufficient sodium hydroxide solution which, when mixed with water from the RWST which contains approximately 1.5 percent by weight boric acid (2400 to 2600 ppm Boron), accumulator water, reactor coolant system water and the melted ice, results in the solution recirculated within containment after a LOCA having a pH in the range of 7.6 to 9.5."

According to the UFSAR, the Unit 1 analysis does not take into account the accumulator water and the Unit 2 analysis does. Does your bounding calculation for Unit 1 take the accumulator water into account? If not, justify.

4. In your submittal, you stated that "to facilitate the pH analyses of the LOCA events, the calculations performed assumed the Unit 2 maximum values that are now proposed for Unit 1.

   Unit 2 UFSAR Section 6.3.2, "System Design - System Description - Spray Additive Tank," states the following: "The tank contains sufficient sodium hydroxide solution to ensure that, when mixed with the refueling water, accumulator water, reactor coolant and melted ice in the containment sump, the solution recirculated within containment after a LOCA has a pH between 7.6 and 9.5."

   Unit 2 Technical Specification (TS) Bases 3/4.6.2.2, "Spray Additive System," states the following: "The limits on NaOH volume and concentration ensure a pH value of between 8.5 and 11.0 for solution recirculated within containment after a LOCA."

   Unit 2 TS Bases 3/4.5.5, "Refueling Water Storage Tank," states the following: "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."

   Explain the differences in these Unit 2 UFSAR and TS bases. Since the Unit 1 bounding analysis uses the same values as Unit 2, does the Unit 1 bounding analysis ensure a pH between 8.5 and 11.0 or 7.6 and 9.5 for the solution recirculated within containment after a LOCA? Explain.

5. Your UFSAR, Section 6.3.2, "System Design - System Description," states the following:

   "During the time period that NaOH solution is added to the spray flow, 26 gpm (approximate) is diverted from the Containment Spray Pump discharge and used as motive water for the eductor. The eductor draws 38 gpm (approximate) {Unit 1 only} and between 23 and 64 gpm {Unit 2 only} from the spray additive tank which produces a solution in the recirculation sump suitable for iodine retention."

   Explain how the bounding calculation pH range is between 7.6 and 9.5 for the solution recirculated within containment after a LOCA for Unit 1 and Unit 2 yet the eductor draws different flow rates from the spray additive tank for Unit 1 and Unit 2. What assumptions were made? Justify.

6. In your submittal, you stated that “the proposed upper limit on volume and concentration for the spray additive tank, also, supports a bounding equipment qualification (EQ) calculation of pH during the LOCA and main steam line break (MSLB) events. What is the pH range for the bounding EQ calculation ? Does this pH range bound the chemical effects for injection phase and recirculation phase ?

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