From: Boska, John
Sent: Friday, March 01, 2013 2:18 PM
To: Alter, Kent R
Cc: Guill, Paul F
Subject: Oconee Nuclear Station, Units 1, 2, and 3, NRC Request For Additional Information on Errors Reported per 10 CFR 50.46 (TACs ME9119, ME9120, ME9121)

On March 9, 2012, Duke Energy Carolinas, LLC (Duke), submitted a report on emergency core cooling system (ECCS) analysis errors, ADAMS Accession No. ML12073A354, for Oconee Nuclear Station, Units 1, 2, and 3. On October 26, 2012, the Nuclear Regulatory Commission (NRC) staff issued a request for additional information (RAI), ML12300A201. On December 7, 2012, Duke replied to the RAI, ML12348A055. The NRC staff is reviewing the submittal and has determined that additional information is needed to complete its review. The specific questions are found below. Please provide a response to this RAI within 30 days of the date of this email.

REQUEST FOR ADDITIONAL INFORMATION:

1. For the analyses completed pertaining to the ECCS bypass error for the lowered loop design, a 2.506-ft peak power location was used, and the analyses for the ECCS bypass error for the raised loop design used a 9.536-ft peak power location. In the December 7, 2012, supplemental letter, the effects of the end-of-bypass timing error are expressed in terms of liquid inventory available to reach the lower plenum and initiate a bottom-up core reflood. The effects of an adiabatic heatup, which is terminated by the core reflood, are also discussed. In consideration of these phenomena, it would appear that a higher
elevation in the core would be a more limiting location to evaluate the effects of an error associated with end-of-bypass timing.

Provide information to demonstrate that the bottom-peaked power shape being used for the lowered loop design is conservative and/or appropriate.

2. After evaluating a 177 fuel assembly (FA) lowered loop (LL) plant with column weldments modeled for a 205 FA plant, details of the column weldments for a 177 FA plant were developed. The model for column weldments of a 177 FA plant were then used for the analyses of a raised loop (RL) plant. Two 177 FA raised loop cases showed that the newly developed column weldments increased PCT for an unruptured fuel segment by 3 degrees Fahrenheit.

It was also reported that the column weldments in a lowered loop plant increased PCT by 11.5 degrees Fahrenheit for an unruptured fuel segment and 26.2 degrees Fahrenheit for a ruptured fuel segment. This result was bounded by generically estimating the effect of column weldments to be an increase in PCT of 80 degrees Fahrenheit.

Column weldments in a raised loop plant increased PCT by 8.9 degrees Fahrenheit for an unruptured segment, which is less than the effect seen in the lowered loop design.

a. Provide justification to show that analyzing column weldments modeled for a 177 FA plant has an effect on PCT of the same magnitude in a lowered loop plant as in a raised loop plant.
b. Describe the nodalization for the column weldments used in RELAP5 analyses.
c. Provide simplified drawings to compare the column weldment design for a 205 fuel assembly plant to the column weldments for the 177 fuel assembly plant.

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