DRAFT

REQUEST FOR ADDITIONAL INFORMATION (RAI)

ANP-10287P, "INCORE TRIP SETPOINT AND TRANSIENT

METHODOLOGY FOR U.S. EPR TOPICAL REPORT"

(TAC NO. Q00013)

DOCKET NUMBER 52-020

RAI-1. Describe the implications of mixed cores in the methodology. How will multiple DNBR correlations be implemented in the protection system? How will uncertainties and parameters of the on-line DNBR model (e.g. FH and FG) be recalculated?

RAI-2. Describe the tuning of the protection systems based on plant measurements (e.g., actual plant flow) at startup. Would a full set of Chapter 15 analysis be required if the setpoint assumptions are changed?

RAI-3. Provide a simulation of burnup over 15 days and the change in SPND calibration constants. How is Cij changing with time? How does the change in Cij affect the setpoint?

RAI-4. Describe the reload process for setpoint calculations. Define what calculations are performed generically for each fuel type, and which are cycle-specific.

RAI-5. Describe what setpoint values will be included in the COLR. Are any setpoints cycle-independent? What are the criteria to verify the applicability of cycle-independent values?

RAI-6. Provide a description of the process used by Areva to select the database of power shapes and statepoints used for tolerance determination. Specify the typical number of shapes and statepoints that are used for the setpoint determination for a typical reload setpoint analysis.

RAI-7. Provide a description of the process used to simulate the system and in-core scrams for transient analysis. Specify which codes and models are used for every step. Specifically, specify when LYNXT vs the online DNBR models are used.

RAI-8. Provide the process used to calculate the FH and FG functions for the online DNBR calculation. Explain what physical processes (e.g. cross flow) are being captured by these functions to make ALGO and LYNXT conditions

agree. Since FH and FG are part of a complex setpoint, describe what process will be followed to re-set these setpoints for new fuel types. Describe the implications of cycle-specific load patterns (e.g., radial peaking factors)

RAI-9. Provide an example calculation of FH and FG for a representative fuel and the database of power distributions

RAI-10. Using the Areva process for calculating FH and FG for the on-line DNBR algorithm model for new fuels, assume that the new fuel geometry is the exact geometry used for the CHF tests. Develop specific FH and FG curves and apply the on-line DNBR algorithm methodology using the CHF test operating conditions. Compare the on-line DNBR algorithm DNBR predictions against the test data.

RAI-11. For a representative loss of flow event, provide the DNBR as function of time calculated by the on-line DNBR algorithm and by LYNXT. In addition, provide steady state comparisons between both codes.

RAI-12. Describe the isolation systems that will actuate in case an AMS tube ruptures inside the vessel.

RAI-13. Describe in physical terms the MEDIAN methodology used to extrapolate the adjusted fluxes to the non-measured nodes (Section E4 of ANP-10287). Provide an example calculation with the actual numbers for an AMS measurement.

RAI-14. Provide measured data to support local peaking factor uncertainty discussed in Section E.7.4 of ANP-10287 over the relevant range of exposures where a fuel pin would be limiting.