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Sent: Monday, November 01, 2010 1:32 PM
To: Helen Etheridge; Joe Waters (jrwaters@aep.com); mkscarpello@aep.com
Cc: Mendiola, Anthony; Huang, Tai; Pascarelli, Robert; Ulses, Anthony; Ward, Leonard
Subject: D.C. Cook Unit 2 - Draft RAI re.downcomer boiling for the proposed LBLOCA amendment (TAC ME1017)

Helen::

The NRC staff completed its sensitivity study on downcomer boiling and the effect of lateral k-factor on this phenomenon. The case with zero lateral k-factor in the downcomer cross flow paths joining the azimuthal cells resulted in a 400 degrees F reduction in peak clad temperature. This was due to the maximization of mixing between the downcomer azimuthal cells which severely limited downcomer boiling. The cold water entering the downcomer during the long term readily mixed into the adjacent downcomer volumes and reduced boiling and the resulting core uncover and clad temperature. ECC bypass and liquid sweep-out that dominate the very early portion of the event (the first 100-200 seconds) does not prevail during the longer term when the downcomer fills with liquid and vapor velocities are no longer high enough to entrain and sweep out the injected liquid.

Based on these results, the NRC staff needs to request that an additional analysis of downcomer boiling be performed for D. C. Cook Unit 2 with the lateral k-factors based on Idelchik included in the downcomer resistance model in the WCOBRA/TRAC model. The additional comparative study should show the impact of the lateral k-factor on PCT during downcomer boiling following a large break LOCA.

If you so desire, the NRC staff will be ready to discuss with you in a conference call this information request.

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