

**From:** Amy Cabbage  
**To:** Hinds, David H (GE Energy); Kinsey, James C (GE Infra Energy); Marquino, Wayne (GE Infra Energy); White, Frostie (GE Infra Energy Non-GE)  
**Date:** 12/06/2006 11:52:03 PM  
**Subject:** new draft RAI and supplemental RAI response request (PROPRIETARY)

Frostie,

See attached new draft RAI 21.6-95 that was identified by the staff as a result of the recent audit regarding ESBWR methods. We plan to include this item in our audit report and to formally issue this RAI in a future RAI letter.

The second attachment provides requests for supplemental RAI responses for the following RAIs:

RAI 4.3-4 - This request for supplement is also tied to audit results and will also be documented in the audit report. Please note that this is additional feedback on this RAI. Feedback was previously provided via e-mail on 9/26/06;

RAI 21.6-86 - This is related to new RAI 21.6-95 discussed above; and  
RAI 21.6-88

Please contact Martha to arrange a call to discuss the new draft RAI and the RAI supplement requests.

Please note that we have identified some information in the attached files as proprietary and we have marked it accordingly. **Please contact Martha to confirm that all of the proprietary content was appropriately identified.**

Thanks,  
Amy

**CC:** Barillas, Martha; Klein, Veronica; Landry, Ralph; Yarsky, Peter

**Mail Envelope Properties** (457794FA.F7B : 18 : 35676)

**Subject:** new draft RAI and supplemental RAI response request (PROPRIETARY)  
**Creation Date** 12/06/2006 11:13:46 PM  
**From:** Amy Cabbage

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Files	Size	Date & Time
MESSAGE	1655	12/06/2006 11:13:46 PM
Draft RAI 21.6-95 PROPRIETARY.pdf	30558	12/06/2006 10:39:22 PM
ProprietaryStaffcommentsonGEResponsetoMFN06297andMFN06467.pdf	28417	12/06/2006 10:48:42 PM

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**ReplyRequested:** No  
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NRC staff comments on GE's partial response to RAI letter 53 (MFN-06-297)

Additional Comments on response to RAI 4.3-4

Provide a cycle re-analysis of [[ ]]. The purpose of this analysis is to demonstrate that the code error corrections and revisions have not resulted in a significant change to the predictive capability of the nuclear design codes or have lead to an unnoticed error in the implementation of the methodology.

The calculation will use TGBLA06AE4 and TGBLA06AE5 generated lattice parameters and be performed with PANAC11AE8. The re-analysis will be performed with the [[ ]]\_disabled. The re-analysis

will include a plot of the cycle [[ ]]. Provide the [[ ]]. Provide a comparison of the [[ ] to the quantities provided in MFN-098-96.

As part of this analysis provide the [[ ] in the [[ ]] GE fuel lattices as calculated using TGBLA06AE4 and TGBLA06AE5 for each depletion analysis in the standard production method [[ ]].

#### NRC staff comments on GE's partial response to RAI letter 66 (MFN-06-467)

##### 1. Comments on response to RAI 21.6-86

Confirm whether or not GE is seeking NRC approval of the PANAC11 isotopic tracking methods, referred to in the response to RAI 21.6-86, for application to the ESBWR.

##### 2. Comments on response to RAI 21.6-88

In the linear interpolation calculation for the individual channel flow rates, the response reiterates that the bundle flows are based on linear interpolation from characteristic channel flow rates. To evaluate the efficacy of the individual flow rate calculation for the ESBWR, the staff must understand:

1. How are characteristic channels selected? If they are based on user supplied information, what procedure or internal guidance is used to make the selection?
2. Are the characteristic channels that exist found in the PANACEA core model or hypothetical channels?
3. If the channels are hypothetical channels, are there any administrative controls that ensure that the hypothetical channels include a spectrum of bundle characteristics that encompass those likely to be experienced by the bundles in the core? Specifically, is there any requirement that the characteristic channels include: radial and axial power shapes that bound those experienced in the core, clean and maximum crud thicknesses, channel geometries for each fuel type in the core, and minimally and maximally orificed geometries? For the five characteristic channels provide: the channel powers, axial power shapes, the crud thicknesses, geometries, and orifices considered. Compare these quantities to the maximum and minimum values of the channels in the PANACEA ESBWR core model at BOC and EOC.
4. The characteristic channel flow is based on pressure drop equalization, however, the only flow input is the total core flow. How is the total core flow rate number used mathematically to determine the flow that must be subdivided across the five characteristic channels (if they are hypothetical or otherwise)?
5. Provide two examples, one for the channel power and one for the axial power shape, how a difference in these quantities between a PANACEA bundle and one of the characteristic channels mathematically translates into the PANACEA bundle flow rate.
6. If the five characteristic channels are used to correlate flow (linearly or otherwise) to channel characteristic parameters, provide the mathematical representation of the response surface.

Update the LTR to include this information.

**Draft Requests for Additional Information (RAIs) NEDC-33239P “GE14 for ESBWR Nuclear Design Report”**

RAI Number	Reviewer	Question Summary	Full Text
21.6-95	Yarsky P	PANAC11 isotopic tracking method	<p>Section 1.4.7 of NEDC-33239P, Rev. 0, describes an isotopic tracking method. As part of an audit, the staff reviewed aspects of the [[ ]]. Confirm whether or not GE is seeking NRC approval of the [[ ]] isotopic tracking method for the ESBWR since this tracking method is different from the tracking method provided in LTR NEDC-33239P, and GE is proposing to remove this section as stated in RAI response 21.6-86 (MFN 06-467). If GE is seeking NRC approval for this methodology for the ESBWR:</p> <p>A. Provide a list of the specific licensing analyses that rely on calculations performed using this methodology.</p> <p>B. Provide an analysis comparing the PANAC11AE8 [[ ]] and TGBLA06AE5. This analysis should compare the isotopic inventory predicted for a GE14E [[ ]] node, a GE14E [[ ]] node near [[ ]], and a GE14E [[ ]] node through a full range of exposure (initial loading to discharge) based on a characteristic bundle exposure history in the ESBWR equilibrium cycle. The PANAC11 calculated inventory for these nodes should be compared to an explicit depletion calculation performed using TGBLA06AE5 where restart calculations are used to emulate the control, exposure and void history for the aforementioned nodes. The TGBLA06AE5 restart calculations should use an [[ ]] that is equivalent to the [[ ]].</p> <p>C. Justify the dependence of the isotopic inventory on [[ ]].</p>