From: "White, Frostie (GE Infra, Energy, Non-GE)" <frostie.white@ge.com>
To: "Martha Barillas" <MCB@nrc.gov>
Date: 01/10/2007 4:35:22 PM
Subject: RE: Supplemental RAI response request (PROPRIETARY)

I thought I had; however, we have reviewed and the Proprietary info has
been captured.
Frostie

Frostie A. White, PhD
Regulatory Affairs
910-675-6880
GE Nuclear

-----Original Message-----
From: Martha Barillas [mailto:MCB@nrc.gov]
Sent: Wednesday, January 10, 2007 3:49 PM
To: White, Frostie (GE Infra, Energy, Non-GE)
Subject: Fwd: Supplemental RAI response request (PROPRIETARY)

Frostie,
I understand we are scheduled to have a phone call on this request
tomorrow. While I was out of the office, did you respond to Amy about
the PROPRIETARY content?
Thanks,

Martha C. Barillas
Project Manager-ESBWR
NRO/DNRL/NGE1
301.415.4115
mcb@nrc.gov

>>> Amy Cubbage 12/27/2006 5:22:21 PM >>>
Frostie,

See attached request for supplemental RAI response related to GE's
response to RAI 4.2-12 (MFN-06-492, Partial RAI Response to RAI Letter
66). Please contact Martha if you have any questions about this
request.

Please note that we have identified some information in the attached
file as proprietary and we have marked it accordingly. The second file
is a redacted version. Please contact Martha to confirm that all of the
proprietary content was appropriately identified.

Thanks,
Amy

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

Mail Envelope Properties (45A55C10.45F : 13 : 62559)

Subject: RE: Supplemental RAI response request (PROPRIETARY)

Creation Date Wed, Jan 10, 2007 4:34 PM
From: "White, Frostie (GE Infra, Energy, Non-GE)" <frostie.white@ge.com>

Created By: frostie.white@ge.com

Recipients
nrc.gov
MCB (Martha Barillas)

Post Office	**Route**
	nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	1197	Wednesday, January 10, 2007 4:34 PM
Mime.822	1	

Options

Expiration Date:	None
Priority:	Standard
ReplyRequested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

Junk Mail Handling Evaluation Results
Message is eligible for Junk Mail handling
This message was not classified as Junk Mail

Junk Mail settings when this message was delivered
Junk Mail handling disabled by User
Junk Mail handling disabled by Administrator
Junk List is not enabled
Junk Mail using personal address books is not enabled
Block List is not enabled

Comments on MFN-06-492, Partial RAI Response to RAI Letter 66

Comments on response to RAI 4.2-12

The response states that the pin power uncertainty established in NEDC-32964P-A is applicable for the ESBWR. The uncertainty referred to in the response is a combination of the [[ ]] uncertainties. The staff accepts that similarities to current fuel products justify the application of the [[ ]] uncertainty. However, the staff does not accept the basis for applying the [[ ]] or [[ ]] uncertainties. The [[ ]] uncertainty should be increased to [[ ]] (see NEDC-33173P). The [[ ]] uncertainty was based on [[ ]] data for fuel types ranging from [[ ]] and were not representative of the [[ ]] for the ESBWR. The response should be modified to adopt a [[ ]] uncertainty based on a [[ ]] for expanded operating domain BWRs. The staff does not find any justification for a smaller [[ ]] uncertainty for the ESBWR. However, the improvement in the PANAC11 methodology over PANAC10 supports reducing the [[ ]] uncertainty to [[ ]].

The [[ ]] uncertainty is derived from gamma scan data from the K5 plant. Were the barium

concentrations predicted in the adapted core simulations based on the PANAC11 isotopic model? If so, justify the use of this model (see RAI 21.6-95). If another off-line technology was used, describe the interface with the PANAC11 calculational engine and the method for determining the barium concentration. Provide the discharge exposure for the scanned fuel. The basis for the [[ ] uncertainty is an RMS difference in Table 7A-4 of the DCD; provide the standard deviation in [[ ]] based on the gamma scan data from the K5 plant. Reevaluate the [[ ]] uncertainty based on a [[l]] uncertainty that is twice the standard deviation or justify the use of the RMS difference.

Verify that the K5 gamma scan data were for modern fuel designs, specifically designs that include [[ ]]. If the gamma scan data did not include bundles with [[ ]] justify the [[ ]] uncertainty by providing TGBLA06AE5/PANAC11AE8 predictive calculations and comparisons to absolute adapted 3D MONICORE [[ ]] power calculations that illustrate there is no degradation of the accuracy of the nuclear methods to predict [[ ]] power for these modern fuel designs over the course of a cycle. This analysis should be performed for plant E cycle 9 or cycle 10 in the experience database detailed in Table 1-14 of NEDC-33239 rev. 0.

[[ ]] gamma TIP uncertainties are known to [[ ]] with increasing power to flow ratios. RMS differences have been shown to [[ ]] by approximately [[ ]] (see MFN-05-029). Provide a basis for not taking into account the difference in power to flow ratio between K5 and ESBWR in the gamma thermometer [[ ]] uncertainty calculation. Provide the core thermal power and flow rate for K5 during the period of operation when the scanned fuel was in-core. Describe the adaption technique used in the K5 core follow analysis (absolute or shape). Verify that the core follow analysis was performed with TGBLA06/PANAC11.

Update Figure 7.2-8 in DCD Tier 2 to indicate the axial elevation of the seven GTs per instrument tube relative to the bottom of active fuel.

Verify that the adaption technique for ESBWR is based on gamma thermometer readings as opposed to LPRM readings. Update DCD Tier 2, Section 7A.3.2 to include the specific adaption technique and the specific means for LPRM calibration for the ESBWR.

Justify the [[ ]] uncertainty adder in NEDC-33173P for a seven GT configuration. Verify that sufficient GTs are included in the ESBWR design such that extrapolation of the GT signal is not necessary to determine the nodal power in every group of four non-peripheral or blanket nodes (assuming that only one instrument is needed for every four quadrant symmetric groups). If the instrument reading calculation is not based on the contribution from the [[ ]] surrounding bundles, [[ ]], specifically address the contribution of the extrapolation technique on the [[ ]] uncertainty for power shapes with multiple local axial peaks (i.e. double humped).

If the [[ ]] in PCGEN (or equivalent module in 3D MONICORE) has been updated for ESBWR GT calculations, provide the update and a discussion of any uncertainties that may have been introduced as a result of the update. Verify that [[ ]] calculations have been performed for the specific lattices used in the ESBWR. Verify that these [[ ]] calculations include any differences between gamma TIP instruments and gamma thermometers that may impact the calculated [[ ]]. Verify that the statistical uncertainty for these [[ ]] calculations is sufficiently small that it does not contribute to the uncertainty (i.e. less than [[ ]]). If [[ ]] has been internally qualified through a [[ ]], provide the basis for the qualification.

The calibration accuracy for the GT system is reportedly [[ ]] (see NEDC-33197P) describe the component of the [[ ]] uncertainty that accounts for the calibration accuracy. If this uncertainty is to be included in the [[ ]] uncertainty, justify an [[ ]] uncertainty of [[ ]].

Update NEDC-33197P to include this information. If the [[ ]] uncertainty is greater than [[ ]], then revise NEDC-33242P accordingly.