From: "White, Frostie (GE Infra, Energy, Non-GE)" <frostie.white@ge.com>
To: "Amy Cubbage" <AEC@nrc.gov>
Date: Mon, Jan 8, 2007 11:13 AM
Subject: RE: Request for supplemental info on 4.4 RAIs

Amy,

We do not see any proprietary information either in the document.

Martha,

When you get back and have time, would like to schedule a brief phone cal on RAIS 4.4-23 and 4.4-31 at your earliest convenience.

Thanks,

Frostie

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

-----Original Message-----
From: Amy Cubbage [mailto:AEC@nrc.gov]
Sent: Friday, January 05, 2007 9:57 PM
To: Hinds, David H (GE Infra, Energy); White, Frostie (GE Infra, Energy, Non-GE); Kinsey, James C (GE Infra, Energy); Sedney, Kathy K. (GE Infra, Energy); Marquino, Wayne (GE Infra, Energy); Moen, Stephan C. (GE Infra, Energy); Fawcett, Russ M. (GNF)
Cc: Anthony Attard; James Gilmer; Martha Barillas
Subject: Request for supplemental info on 4.4 RAIs

Kathy,

See attached request for supplemental information needed to resolve several Chapter 4.4 RAIs (4.4-2, 4.4-5, 4.4-23, 4.4-25, 4.4-26, and 4.4-31). We have not identified any proprietary information in the attached file. However, please verify that there is no proprietary content so we can place this request in ADAMS.

Please give high priority to supplemental response to RAI 4.4-25 to support the staff's planned confirmatory studies. Please contact me with a schedule for your response to this item next week.

If you have any questions regarding this request or would like to schedule a telecon please contact Martha. If you have any immediate questions before Martha returns please reply to me.

Thanks,

Amy E. Cubbage, Sr. Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing, NRO
301-415-2875

CC: "Martha Barillas" <MCB@nrc.gov>, "Marquino, Wayne (GE Infra, Energy)" <wayne.marquino@ge.com>

Mail Envelope Properties (45A26D9A.4B5 : 9 : 1205)

Subject: RE: Request for supplemental info on 4.4 RAIs
Creation Date Mon, Jan 8, 2007 11:12 AM
From: "White, Frostie (GE Infra, Energy, Non-GE)" <frostie.white@ge.com>

Created By: frostie.white@ge.com

Recipients
nrc.gov
AEC (Amy Cubbage)

nrc.gov
MCB CC (Martha Barillas)

ge.com
wayne.marquino CC (Wayne (GE Infra Energy) Marquino)

Post Office	**Route**
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Files	**Size**	**Date & Time**
MESSAGE	1603	Monday, January 8, 2007 11:12 AM
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

NRC Staff comments on GE's partial responses to RAI letter no. 53 (MFN-06-297)

1. Comments on response to RAI 4.4-2:

On November 3, 2006, the NRC staff conducted an audit of Reference 4.2.-2.1, Topical Report NEDE-21565, "BWR Void Fraction Correlation and Data". It was noted that the report was prepared in 1977 and includes data for 4x4, 6x6, 7x7, and 8x8 fuel bundle designs. It does not include test data for fuels with greater than 8x8 bundles (such as the 10x10 arrangement of the ESBWR fuel). Most of the data was collected at approximately 1000 psia. A limited number of measurements were taken at lower or higher pressures. Some limitations and recommendations were provided in Section 7.0 of the report. These include:

- No transient data
- Radial peaking of power distribution resulting in shifting of data
- Lack of data for the countercurrent flow regime
- Lack of low pressure multi-rod data

Additionally, it was stated that the correlation was heavily weighted by the CISE (4x4) data, since it was deemed to be most accurate.

Table 4.2-2-1 (Void Fraction Correlation Database) does not include test data for a 10x10 bundle configuration representative of the GE14E design. Also, the data supplied for other geometries gives only the maximum void fraction and exit quality data points for the range of pressure, mass flux, and inlet subcooling conditions specified.

For the 10x10 configuration, provide a graph or table of the test results for void fraction as a function of quality. Show both the measured values and the correlation-predicted (calculated) values of void fraction. Provide a discussion of the uncertainty in the void fraction correlation due to bundle geometry.

2. Comments on response to RAI 4.4-5:

The explanation provided in the response for the applicability of referenced Topical Report NEDO-10958-A for bundle critical power performance prediction is acceptable. However, the response refers to NEDC-33237P to address applicability to GE14E fuel for the ESBWR. The NRC Staff is currently evaluating this Topical Report, and cannot complete its assessment until the revision is submitted and confirmatory analyses have been performed. The proposed response includes a reference to revision 1 to DCD Reference 4.4-12. The phrase 'scheduled October 2006' should be updated to reflect the actual publication date.

3. Comments on response to RAI 4.4-31:

The response is not complete; the staff requests that GE submit the time-to-boiling transition calculation for the GE14E fuel**.**

NRC Staff comments on GE's partial responses to RAI letter no. 53 (MFN-06-399)

1. Comments on response to RAI 4.4-23:

The proposed response is not complete; the NRC staff requests that GE submit the flow blockage calculation for the GE14E fuel (showing the critical power as a function of percent blockage).

NRC Staff comments on GE's partial responses to RAI letter no. 53 (MFN-06-350)

1. Comments on response to RAI 4.4-25:

The NRC staff plans to perform confirmatory studies to evaluate the use of the GEXL14

correlation for the GE14E fuel of the ESBWR. The staff requests the COBRAG program executable and identification of the computer platform and operating system, the User Manual, and the code input decks used for the geometry difference studies (including spacer separation and part length rod height). It should be noted that this request does not imply a formal staff review of the COBRAG program at this time.

NRC Staff comments on GE's partial responses to RAI letter no. 53 (MFN-06-405)

1. Comments on response to RAI 4.4-26

The response was discussed in a conference call on November 17, 2006. In Part D of the RAI, the staff requested 95/95 confidence level calculations for the data provided. GE's position is that the statistical analyses performed for BWR's is the demonstration that at least 99.9 percent of the fuel rods would be expected to avoid boiling transition during the transient of the limiting analyzed AOO.

This approach not acceptable to the staff since GE has no GE14E-specific fuel test data. The staff had expected GE to support the staff in arriving at a satisfactory resolution by providing the needed statistical information.
Other questions raised during the conference call which should be addressed in the supplemental response include:

- In Table A-1, how is the standard deviation determined?
- In Table A-2, why is no standard deviation provided for the combined inlet and outlet peak?
- In Table A-3, why is no cosine peak provided?
- In Table 4-1 of the Topical Report NEDC-33237P, referred to in the response to RAI 4.4-26, how were the standard deviations determined (i.e., weighted average or simple addition)?
- In Table 4-1 of the Topical Report NEDC-33237P, referred to in the response to the RAI, what are the 'interaction effects' referred to?