

February 3, 2005

Dr. Robert E. Gamble, Manager, ESBWR
General Electric Company
175 Curtner Avenue, M/C 365
San Jose, CA 95125-1014

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 1 RELATED TO
NEDE-33083P, SUPPLEMENT 1, "TRACG APPLICATION FOR ESBWR
STABILITY ANALYSIS"

Dear Dr. Gamble:

By letter dated December 9, 2004, General Electric Company (GE) submitted NEDE-33083P, Supplement 1, "TRACG Application for ESBWR Stability Analysis." The Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this topical report to ensure that the information is sufficiently complete to enable the NRC staff to reach a conclusion on the acceptability of these reports.

The NRC staff has determined that additional information is necessary to continue the review. Enclosure 1 contains requests for additional information (RAIs) regarding NEDE-33083. These RAIs were sent to you via electronic mail on January 3, 2005, and were discussed during a teleconference on January 18, 2005. One RAI was deleted because GE informed the staff that the requested information, namely the eigenvalue separation, had already been provided in Table 8.1-2 of the submitted topical report. Changes of an editorial nature were made to the remaining RAIs, however, the technical content has not been changed. Please provide the requested information by February 28, 2005, so that the review can be completed in a timely manner.

If you have any questions or comments concerning this matter, you may contact me at (301) 415-2875 or aec@nrc.gov.

Sincerely,

/RA/

Amy E. Cubbage, ESBWR Project Manager
New Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Project No. 717

Enclosure: As stated

cc: See next page

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ACCESSION NO. ML050330481

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Requests for Additional Information (RAIs)
NEDE-33083P, Supplement 1, "TRACG Application for ESBWR Stability Analysis"

Requests for Additional Calculations:

1. Startup with Neutronic Feedback

The TRACG ESBWR startup simulations provided in NEDE-33083P, Supplement 1, do not include neutronic feedback. Even though core void generation occurs late in the transients analyzed (when the pressure is significant), the calculations shown are not conclusive because the void feedback could conceivably result in large power oscillations when coupled to operator actions to maintain the reactor at power.

Please provide a TRACG simulation of ESBWR startup that includes the neutronic feedback. Use the limiting heat up rate. Describe in detail the control model used to simulate operator actions to maintain the reactor at power during the startup transient.

2. ODYSY Calculation

Provide a frequency domain ODYSY calculation for ESBWR beginning of cycle (BOC) conditions. Provide a comparison between the channel, core-wide, and out-of-phase decay ratios calculated by ODYSY and TRACG

3. TRACG Calculation of Instability Threshold

Perform a series of TRACG steady-state calculations at BOC conditions with increasing powers until unstable power oscillations develop to demonstrate the power-margin to instability. Provide calculations for the channel, core-wide, and regional instability modes. Do not exceed power levels for reasonable TRACG calculation limits; it is an acceptable response to specify that the stability power-margin is "greater than 20%".

Requests for Additional Data from Existing Calculations:

4. 3D Power Distribution

Please provide the 2D (channel powers) and 3D power distributions for BOC, middle of cycle (MOC), and end of cycle (EOC) in electronic format.

5. Subcritical Mode Power Distribution

Please provide the 2D and 3D power distributions for the calculation shown in Figure 8.1-5 of the first subcritical mode at BOC conditions in electronic format. Also, please provide a short description of the calculation tools used for this calculation.

6. Pressure Drops

Please provide the pressure drop and void fraction as function of elevation for BOC conditions. Provide it at least for a hot channel and an average channel along with their power and flow conditions.

7. TRACG Time Traces

Please provide the time trace data for Figures 8.1-8 through 11, and 8.1-19 through 20 in electronic format.

Request fo ESBWR Design Information:

8. ESBWR Design Parameters

Please provide the following ESBWR design parameters:

Parameter	Units	Value
Number of fuel rods		
Channel height		
Heat transfer area per unit axial length		
Channel flow area		
Hydraulic diameter		
Density of the fuel		
Fuel pellet diameter		
Cladding heat capacity		
Cladding thermal conductivity		
Cladding thickness		
Gap heat transfer coefficient		
Gap width (nominal)		