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CNRO-2005-00046

August 19, 2005

U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001  
Attention: Document Control Desk

DOCKET: 52-009

SUBJECT: Response to Request for Additional Information to Resolve the Grand Gulf Early Site Permit draft Safety Evaluation Report Open Item 2.5-3

REFERENCE:

1. System Energy Resources, Inc. (SERI) letter to USNRC – Early Site Permit Application (CNRO-2003-00054), dated October 16, 2003.
2. USNRC letter to SERI – Potential Open Items for the Draft Safety Evaluation Report for the Grand Gulf Early Site Permit Application (CNRI-2005-00003), dated March 24, 2005.
3. USNRC letter to SERI – Draft Safety Evaluation Report for the Grand Gulf Early Site Permit Application (CNRI-2005-00004), dated April 7, 2005.
4. SERI letter to USNRC – Response to Request for Additional Information to Resolve the Grand Gulf Early Site Permit Draft Safety Evaluation Report Open Items (Additional Seismic Questions) (TAC No. MC1378) (CNRO-2005-00034), dated June 23, 2005.
5. Case Study of Alternate Treatments of PA=0.5 Source Hazard by Steve Harmsen, USGS, for NRC; NRC ADAMS Accession Number ML052070247, dated July 26, 2005

CONTACT:

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On Monday, July 25, 2005, the NRC requested additional information relating to DSER Open Item 2.5-3. This letter transmits information as outlined in Attachment 1 to this letter.

Additionally on July 26, 2005, the NRC provided SERI the summary of the independent evaluation done by the USGS to assess the possible contribution to the hazard at the Grand Gulf ESP site from the Saline River Source Zone (SRSZ) if an alternative deaggregation approach were used (Reference 5). SERI expects to provide comments on the summary by August 26, 2005. As shown in Attachment 1 of this letter, SERI has concluded that the

assumed 5 to 10 percent contribution from the SRSZ, based on the alternative USGS deaggregation approach, results in only slight differences (<1%) in the 5-10 Hz controlling earthquake rock ground motions for the GGNS ESP site. Although SERI has completed the sensitivity analysis agreed to in our July 25, 2005 conference call, and demonstrated that there are insignificant differences in results for the GGNS EPS site, we wish to point out that the independent evaluation methods are inconsistent with the EPRI methodologies approved by the NRC for use in Regulatory Guide 1.165 (03/1997). Therefore, further discussion of the alternative USGS approach should not impact the NRC review of the GGNS ESP Application (Reference 1) or closure of DSER Open Item 2.5-3 (Reference 3).

Should you have any questions, please contact me.

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 19, 2005.

Sincerely,

A handwritten signature in black ink, appearing to read 'G. Zinke', with a large, stylized flourish at the end.

George A. Zinke  
Project Manager  
System Energy Resources, Inc.

Attachment: Attachments 1

cc: Mr. R. K. Anand, USNRC/NRR/DRIP/RNRP  
Ms. D. Curran, Harmon, Curran, Spielberg, & Eisenberg, L.L.P.  
Mr. W. A. Eaton (ECH)  
Mr. B. S. Mallett, Administrator, USNRC/RIV  
Mr. J. H. Wilson, USNRC/NRR/DRIP/RLEP

Resident Inspector's Office: GGNS

## ATTACHMENT 1

### Additional Information Regarding NRC Open Item 2.5-3

At the request of the NRC, a conference call was held on Monday July 25, 2005 to discuss the NRC Open Item 2.5-3. Participants included staff from the NRC, USGS, SERI, Inc. (the Applicant), and the Applicant's consultants William Lettis & Associates, Inc. and Jack Benjamin & Associates, Inc.

The purpose of the teleconference call was to address outstanding issues related to the de-aggregation of the Probabilistic Seismic Hazard Analysis (PSHA) results to determine the controlling earthquakes for development of the median  $10^{-5}$  annual probability of exceedance rock ground motion for the Grand Gulf ESP site. The discussions focused on the relative contribution of the Saline River seismic source (SRSZ) to the de-aggregated PSHA results.

The NRC and their consultant, the USGS, agreed that the source characterization of the SRSZ was acceptable. However, the USGS suggested their calculations, using an alternative computational approach for de-aggregating the PSHA results might lead to differences in the relative contribution of the SRSZ to median  $10^{-5}$  ground motion.

In their evaluation the USGS estimated the contribution of the Saline River source to the  $10^{-5}$  median ground motion for the average spectral acceleration for 5 and 10 Hz could be between 5 and 10 percent. The Applicant agreed to evaluate the sensitivity of this contribution to the 5 – 10 Hz controlling earthquake and resultant spectral shape for postulated SRSZ contributions of 5% and 10%. The NRC staff agreed that if there was no sensitivity to the site response spectra, this would be sufficient to close this open item. The results of this sensitivity analysis are presented below.

### RESULTS OF SENSITIVITY ANALYSIS

A sensitivity analysis was completed to evaluate the influence on the estimate of the controlling earthquake for the average spectral acceleration between 5 and 10 Hz and the resultant rock response spectra, assuming that the SRSZ contributes between 5% and 10% to the median  $10^{-5}$  ground motion at the Grand Gulf ESP site.

In the original PSHA, the controlling earthquake for the average spectral acceleration between 5 and 10 Hz for the Grand Gulf Site was determined to be  $M_w$  6.94 at 175.5 km.

The sensitivity calculation was performed, assuming the relative contribution of the SRSZ (magnitude bin 6.5 to 7 and distance bin 100 to 200km) to the median hazard for 5-10Hz was 5

percent. The relative contribution of the other magnitude-distance bins was normalized to reflect this change. With an increase in the contribution of the SRSZ, the contribution to the hazard from other seismic sources is proportionally lower, in particular from the dominant New Madrid Source Zone that has large magnitude earthquakes and short recurrence intervals. The sensitivity calculation was repeated assuming the SRSZ contribution was 10 percent.

Changing the relative contribution of the SRSZ results in a slight decrease in the  $S_a(5-10\text{Hz})$  controlling earthquake (Table 1). The response spectra based on the original controlling earthquake and the alternative controlling earthquakes (assuming 5% and 10% contribution to hazard from SRSZ) are compared on Figure 1. The comparison indicates there is a very small difference in the rock ground motions. The percent differences for spectral ordinates are shown in Table 2.

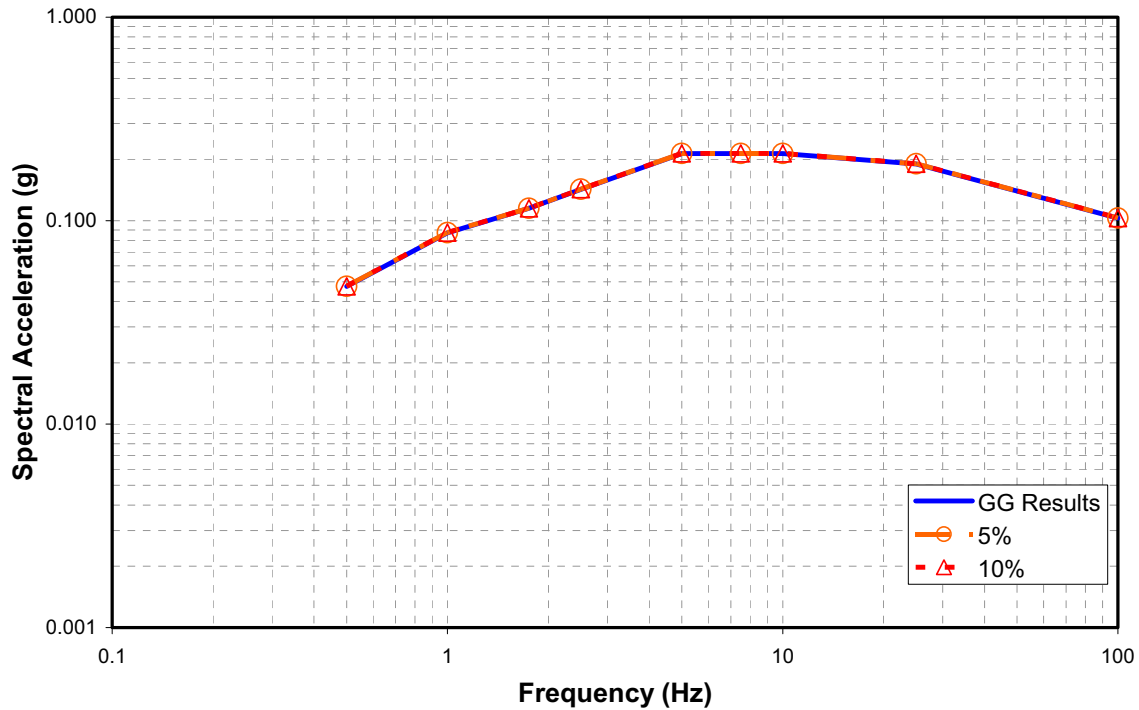
The results of the sensitivity analysis indicate there is a very small change in the 5 to 10Hz controlling earthquake (Table 1) and associated median rock response spectrum (Figure 1) assuming a 5 or 10 percent contribution to the  $10^{-5}$  median hazard from the SRSZ. The differences in response spectral values range from +0.06 to -0.23% of the comparable Grand Gulf spectra (Table 2). Therefore, based on the assumed 5 to 10 percent contribution to the hazard from the Saline River Source Zone used in this analysis, there is less than a 0.23% difference in the computed spectral accelerations.

As a result of the sensitivity calculations, we conclude that a change in the relative contribution of the SRSZ of 10 percent would not result in a significant change to the median rock ground motion at the Grand Gulf site and thus not produce a significant change in the estimate of the Safe Shutdown Earthquake.

**Table 1. Deaggregation of controlling earthquakes at a frequency of 5-10 Hz (all distances) assuming a 5 and 10% contribution to hazard from the Saline River Seismic Zone (SRSZ).**

Contribution to Hazard from SRSZ	Magnitude and Distance Related to Assumed Percent Contribution to Hazard from SRSZ		Original Controlling Earthquake Magnitude and Distance
	5%	10%	
Magnitude (Mw)	6.93	6.92	6.94
Distance (km)	174.46	173.44	175.5

**Figure 1. Comparison of response spectrum for original Grand Gulf controlling earthquake at 5-10Hz, and controlling earthquakes at 5-10Hz assuming 5 and 10% contribution to hazard from the SRSZ.**



**Table 2. Percent difference of spectral acceleration values derived from 5-10Hz controlling earthquakes for assumed 5% and 10% contribution to hazard from SRSZ.**

Median Response at 5 - 10Hz		Median Response at 5 - 10Hz	
5 %: Mc: 6.93 Dc: 174.5 (km)		10 %: Mc: 6.92 Dc: 173.4 (km)	
Frequency (Hz)	Percent Difference in Sa(g)	Frequency (Hz)	Percent Difference in Sa(g)
0.5	-0.23	0.5	-0.23
1	-0.23	1	-0.23
1.75	0.06	1.75	0.06
2.5	-0.23	2.5	-0.23
5	-0.23	5	-0.23
7.5	-0.23	7.5	-0.23
10	-0.23	10	-0.23
25	-0.23	25	-0.23
100	-0.23	100	-0.23

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