

June 6, 2002

MEMORANDUM TO: John Flack, Chief  
Regulatory Effectiveness Assessment and Human Factors Branch  
Division of Systems Analysis and Regulatory Effectiveness

FROM Daniel Dorman, Chief/**RA**/  
Engineering Research Applications Branch  
Division of Engineering Technology

SUBJECT: PROPOSED GENERIC SAFETY ISSUE ON THE IMPLICATIONS OF  
UPDATED PROBABILISTIC SEISMIC HAZARD ESTIMATES

Pursuant to Management Directive 6.4, Appendix A, I nominate the attached candidate generic issue for review. If you have any questions, please call me at 415-6010 or the contacts identified in the attachment.

Attachment: As stated

Distribution:

A. Thadani, RES  
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ERAB r/f, DET r/f

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OAD in ADAMS? (Y or N) Y

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DATE OF RELEASE TO PUBLIC \_\_\_\_\_

SENSITIVE? N

\*see previous concurrence

OFFICE	ERAB/DET	ERAB/DET	ERAB/DET	
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DATE	5 /30 /2002	6/6/2002	6/6/2002	/ /2002

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**PROPOSED GENERIC SAFETY ISSUE ON  
THE IMPLICATIONS OF UPDATED PROBABILISTIC SEISMIC HAZARD ESTIMATES**

Submittal Section	Explanation/Comments (provided by submitter) <sup>1</sup>
(1) Proposed generic issue (GI) title	Implications of Updated Probabilistic Seismic Hazard Estimates
(2) Proposed GI classification	
(3) Description of proposed GI	A draft report on the trial implementation of the Senior Seismic Hazard Analysis Committee (SSHAC) guidance (Ref. 1) for probabilistic seismic hazard assessment to Watts Bar and Vogtle (Ref. 2) shows a higher probabilistic seismic hazard estimate for the Watts Bar site than the value obtained from NUREG-1488 (Ref. 3). The increase in the seismic hazard estimate was investigated in a follow-on study that attributed the increase to experts assigning greater importance to the East Tennessee Seismic Zone. This represents a new interpretation of new seismicity data.
(4) Date of sumittal to GIP Manager in RES	open
(5) Operational events	Not applicable
(6) Affected licensee, certificate holders, or facilities	All power reactor licensees in the Mid-Atlantic and Southeast regions

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<sup>1</sup>Indicate if information requested is either unknown, indeterminate, speculative, does not apply.

(7) Safety issue	<p>A draft report on the trial implementation of the SSHAC guidance for probabilistic seismic hazard assessment (PSHA) on Watts Bar and Vogtle sites (Ref. 2) shows a higher probabilistic seismic hazard estimate for the Watts Bar site than the value obtained from NUREG-1488 (Ref. 3). The PSHA results for the Watts Bar site show that the mean annual frequency of exceeding the SSE design ground motion level of 0.18 g has slightly increased from about 0.0002 exceedances/year, based on the earlier LLNL results, to 0.0004. Since this increase was unexpected, the contractor was requested to review the first study to determine the reasons for the change in the Watts Bar hazard estimate.</p> <p>LLNL (Ref. 4) has identified two sources for the increase in seismic hazard for the Watts Bar site. The first source is associated with using an updated model for the propagation of earthquake ground motion in the eastern United States. The second source, which is considerably more important, is a new composite seismicity model for the region. The seismicity experts, used for the trial implementation of the SSHAC methodology, identified and assigned high credibility to the East Tennessee Seismic Zone (ETSZ), which includes the Watts Bar site. Although the ETSZ has not produced a damaging earthquake in historical time (the largest recorded magnitude is 4.6), there has been a increase in the number of small earthquakes (magnitude 3 earthquakes) recorded by seismic stations in the ETSZ over the past 20 to 30 years.</p> <p>The safety issue is: "Do the new data warrant concerns regarding the seismic design bases for NPPs in the region around the ETSZ?" Also, are other NPPs in the region adversely affected?</p>
(8) Possible solutions	<ol style="list-style-type: none"> <li>1. Evaluate whether the Watts Bar plant could continue operation without undue risk, given the higher value for the probabilistic seismic hazard estimate.</li> <li>2. Evaluate the implication of the higher Watts Bar results by implementing the SSHAC guidance to develop new probabilistic seismic hazard estimates for all other operating power reactors in the Central and Eastern US.</li> </ol>
(9) Affected regulations	10 CFR 100, Appendix A, Seismic and Geological Siting Criteria for Nuclear Power Plants
(10) Applicable standards	None identified
(11) Industry initiatives	None identified

(12) Applicable references	<p>1. NUREG/CR-6372, Vols 1 &amp; 2, Recommendations for Probabilistic Seismic Hazard Analysis: Guidance on Uncertainty and Use of Experts, April, 1997</p> <p>2. Draft LLNL Report NUREG/CR-6607, Guidance for Performing Probabilistic Seismic Hazard Analysis for a Nuclear Power Plant Site: Example Application to the Southern United States.</p> <p>3. NUREG-1488, Revised Livermore Seismic Hazard Estimates for Sixty-Nine Nuclear Power Plants Sites East of the Rocky Mountains, April 1994.</p> <p>4. Draft LLNL Report UCRL-ID 142039, Comparison of The PSHA Results of The 1993-EUS-Update and The 1998-TIP Studies for Watts Bar, March 26, 2002.</p>
(13) Submitter Identification	<p>1. Sada Pullani, RES/DET/ERAB, 301-415-6843</p> <p>2. Andrew Murphy, RES/DET/ERAB, 301-415-6011</p>

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