Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

NOV 1 2 1999

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, DC 20004

Dear Mr. Chairman:

SUBJECT: Savannah River Site (SRS) Actions Taken to Increase Seismic Safety Margin

As a follow-up to my letter to you on seismic margin of July 1998, and as a continuation of our seismic issues dialog which began several years ago, I want to acknowledge the beneficial discussions and progress that our site personnel and your staff have made regarding the approach to increase the seismic safety margin for new, critical missions facilities. I especially want to acknowledge the results from our recent meeting of October 19th and 20th, 1999, with Drs. Eggenberger, Mansfield, and members of your staff.

In support of our common objective of minimizing future challenges to the basic assumptions underlying the development of an appropriate site structural design criteria, SRS has incorporated a higher margin of seismic safety in new, moderate and high-hazard SRS facilities. As a result, we have enhanced our existing, conservative PC-3 envelope surface ground motion spectrum by broadening the spectral shape, and we have incorporated the following changes into the SRS Site Standard 01060 (WSRC-TM-95-1, Standard 01060, Rev. 4):

- Adopt the Uniform Building Code ductile detailing requirements for facilities in Zones 3 and 4,
- Apply a load factor of 1.2 to the seismic load component of applicable load combinations for the evaluation of structural members,
- Factor the in-structure floor response spectra by 1.2 for use in the development of seismic loads for the design of systems and components, and
- Factor the surface settlement profile resulting from dynamic settlement and liquefaction analyses by 1.2.

With these changes Site Standard 01060 imposes seismic design requirements above those contained in DOE standards and National Consensus Standards. The additional design requirements will have a significant impact on the seismic reliability of new facilities.

We have met with your staff and consultants on several occasions to present the SRS technical basis on all ground motion issues and have provided additional information and supporting documentation as shown in the enclosed table. Based on those discussions and the information that has been provided, we have validated our position that we have a technically defensible

ground motion spectrum and associated design criteria. Closure of the ground motion issues reflects the desire for enhanced seismic margin in new, moderate and high-hazard facilities.

The revised site standard provides important direction to achieve a robust design for projects such as the Tritium Extraction Facility, for which detailed design is underway and has been rebaselined to incorporate Rev. 4 of Site Standard 01060. The revised site standard also provides direction for other projects supporting Departmental efforts regarding consolidation of certain plutonium inventories and the Department's effort to meet commitment dates made in response to DNFSB Recommendation 94-1.

With the revision to the Standard 01060 and closure of the seismic issues, we consider the objective of enhanced seismic safety margin at SRS has been met. Design will proceed with reduced programmatic risk, and changes to sesimic design criteria would only be necessary if new ground motion characterization information arises. Closure of the issues will ensure these projects proceed in a timely manner minimizing potential redesign, construction modifications and schedule delays. Again, I want to thank you for the valuable technical input provided by your staff and consultants.

Should you or your staff have questions, please contact me or Brent Gutierrez, of my staff at (803) 725-3919.

Sincerely,

Greg Rudy
Manager

VC-00-0007

Enclosure:
Seismic Action Item List Table

cc w/o encl:
M. Whitaker (S), HQ
C. L. Huntoon (EM-1), HQ
T. F. Gioconda (DP-1), HQ
Laura S.H. Holgate (MD-1), HQ
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D. M. Michaels (EH-1), HQ
O. F. Pearson (EH-3), HQ

Issues on the Seismic Action List

Issue	Initial Response	Supplemental Response #1	Supplemental Response #2
1. Charleston Earthquake Size and Response Spectra.	Rev. 0, 4/8/98	Rev. 1, 7/1/98	
2. Source Distance to Charleston.	Rev. 0, 4/8/98		
3. Comparison of USGS hazard curves for soft-rock to SRS hazard curves.	Rev. 0, 4/8/98	7/6/98	
3a. Explanation of rock motion (USGS vs. NEHRP) differences.	Rev. 0, 10/99		
4. PC-3 comparison to NEHRP97 recommended provisions.	Rev. 0, 4/8/98	7/6/98	
5. Basis for spectral amplification (Gilroy).	Rev. 0, 4/8/98		
6. Description and basis for SRS soil-structure interaction analysis approach.	9/30/99*		
7. Relevance of Bollinger's Charleston earthquake intensity map to SRS.	Rev. 0, 4/8/98	7/6/98	Rev. 2, 8/27/98 6/10/99
8. Provide the ground surface acceleration, velocity, and displacement time histories for the PC-3 and PC-4 response spectra.	Rev. 0, 4/8/98		Rev. 1, 8/27/98 Rev. 2, 8/27/98
9. Applicability of the USGS hazard curves for site conditions.	Rev. 0, 4/8/98	7/6/98	
10. Appropriate use of both cone and standard boring measurements to obtain dynamic soil properties.	K-ESR-F-0005, Rev. 0, 5/98		
11. Provide geotechnical and geological characterization of calcareous soft zones.	9/30/99*		
12. DOE STD-1023-95 Natural Phenomena Hazards Assessment Criteria-Historic Earthquake Ground Motion Criteria	Rev. 0, 4/8/98		
13. A comparison of Band-Limited-White Noise/Random Vibration Theory Ground Motion Models for Eastern and Western United States.	Rev. 0, 4/8/98		

* items not required for closing seismic issues