Department of Energy
Washington, DC 20585

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October 5, 2011

The Honorable Peter S. Winokur
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, DC 20004

Dear Mr. Chairman:

On July 29, 2011, Deputy Secretary of Energy Poneman provided you a report describing the Department of Energy's (DOE's) planned actions to address issues with the System for Analysis of Soil-Structure Interaction (SASSI) computer code. I then met with the Board on August 31, 2011, to further discuss the Department's plans.

This letter provides the Board with an update on DOE's plans for addressing the SASSI issues. On September 29, the Assistant Deputy Administrator for Infrastructure and Construction of the National Nuclear Security Administration (NNSA) directed the two DOE construction projects most impacted by SASSI issues—the Chemistry and Metallurgy Research Replacement (CMRR) Project and the Uranium Processing Facility (UPF)—to develop and execute an integrated action plan to resolve SASSI issues for these two projects. The September 29 memorandum directing this action is attached for information. In particular, the plan requested by that memorandum will develop verification & validation (V&V) problems, corresponding to action #6 in the July 29 action plan. The NNSA memorandum goes farther than the July 29 action plan in that it requests a root cause analysis to determine how anomalous results are produced by the SASSI subtraction method. However, it does not ask CMRR and UPF project personnel to develop supplemental guidance for SASSI users in accord with action #7 in the July 29 plan; it notes that project results will be supplied to the Chief of Nuclear Safety to assist in developing such guidance.

The integrated action plan for the SASSI work as described in the September 29 letter is expected to be completed by November 30, 2011. Several SASSI experts and DNFSB staff members plan to participate in the DOE Natural Phenomena Hazards Workshop scheduled for October 25-26 in Germantown, Maryland. The workshop agenda calls for a special breakout session on SASSI. During this session, participants will be able to discuss the current SASSI issues and provide comments for consideration as the NNSA action plan is finalized.

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If you have any questions, please contact me at (202) 586-0799, or Dr. Stephen McDuffie of my staff, who is organizing the Natural Phenomena Hazards Workshop, at (509) 373-6766.

Richard H. Lagdon, Jr.
Chief of Nuclear Safety
Office of the Under Secretary for Nuclear Security

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Attachment

Department of Energy
National Nuclear Security Administration
Washington, DC 20585

September 29, 2011

MEMORANDUM FOR KEVIN W. SMITH
MANAGER, LOS ALAMOS SITE OFFICE

THEODORE D. SHERRY
MANAGER, Y-12 SITE OFFICE

FROM: MICHAEL A. THOMPSON R. D. Herrera for
ASSISTANT DEPUTY ADMINISTRATOR
FOR INFRASTRUCTURE AND CONSTRUCTION Deputy ADA

SUBJECT: Additional analysis to support resolution of concerns with the System for Analysis of Soil-Structure Interaction (SASSI) computer Program

Recent discussions with staff from both the Chemistry and Metallurgy Research Replacement (CMRR) Project and Uranium Processing Facility (UPF) Project have emphasized several remaining concerns with DOE's response to the DNFSB letter, dated July 29, 2011 regarding the use and validation of SASSI. Specifically for UPF and CMRR, interactions between DNFSB and staff members for each project have focused on resolving two issues associated with the SASSI computer program:

1. Additional verification and validation (V&V) problem scenarios needed for SASSI that better represent the geotechnical complexity of the LANL and Y-12 sites and the dimensions of the CMRR Nuclear Facility (CMRR-NF) and UPF facilities.

2. Complete a root cause analysis to determine how anomalous results are produced when using the subtraction method, based on a thorough understanding of the numerical algorithm and the theoretical basis of the SASSI code.

Please work with your respective Contracting Officers to direct your Management and Operating (M&O) contractor teams to develop and execute an integrated action plan that will resolve these two issues for the two projects. I expect the action plan to emphasize the use of qualified subject matter experts to perform the work. In addition, I expect the results of this effort to be provided to the DOE Chief of Nuclear Safety for consideration in future departmental guidance on the use of SASSI for DOE projects. Analysis of the second issue should include specific treatment of why the modified subtraction method resolves the anomalous results from the subtraction method. Work to resolve these issues should be funded using appropriated Project Engineering and Design (PED) funds from both projects. An integrated action plan for the two projects that is coordinated with NA-16, NA-17, CDNS, and CNS is requested by November 30th, 2011.

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Both projects recognize the issues associated with SASSI and have performed analysis of SASSI using models representative of the CMRR-NF and UPF structures. This analysis indicates that SASSI is applicable for the structure and soil interaction component of seismic design for facilities like CMRR-NF and UPF. The purpose of resolving the two items listed above is to reinforce the validity of the seismic design and to validate that SASSI calculates the structural and soil interaction for these two projects. Given that each project's current seismic design is conservative and developed with other validated analysis tools, it is appropriate for this resolution to occur in parallel with ongoing design efforts.

Since these issues must be resolved and reflected in the soil-structure analyses of each project prior to establishing the full performance baseline for each nuclear facility (Critical Decision (CD)-2/3), I request that you perform the following steps prior to CD-2/3 submittal in FY 2013:

- M&O evaluation and acceptance that resolution of the two issues has been achieved.
- Submittal to the FPD of a technical basis for concluding that the facility design includes sufficient margin, based on current technical design criteria, to compensate for the degree of uncertainty associated with the SASSI analysis.
- Confirmation from the Federal Project Directors (FPDs) that the M&O contractor has adequately addressed the known issues raised associated with soil-structure seismic interaction for their project, and the results are incorporated into the design.

Upon completion, please submit a letter signed by each FPD stating that the integrated project action plan has been successfully completed. If you have any questions, please contact me at (202) 586-5091 or Robert Dino Herrera, Deputy, Assistant Deputy Administrator, at (202)-586-5366.

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