August 7, 2009

Mr. Russell J. Bell, Director
New Plant Licensing
Nuclear Generation Division
Nuclear Energy Institute
1776 I Street, NW, Suite 400
Washington, DC 20006-3708

SUBJECT: RESPONSE TO NUCLEAR ENERGY INSTITUTE LETTER ON BACKFILL INSPECTION, TEST, ANALYSIS, AND ACCEPTANCE CRITERIA

Dear Mr. Bell:

By letter dated June 1, 2009 (Agencywide Documents Access and Management System Accession No. ML091590424), the Nuclear Energy Institute (NEI) submitted a letter to the U.S. Nuclear Regulatory Commission (NRC) to document understandings from the May 8, 2009 meeting with NRC staff to discuss generic inspection, test, analysis, and acceptance criteria (ITAAC) on shear wave velocity (SWV) and compaction for backfill under Category 1 structures.

The NRC staff met internally to discuss questions introduced at the public meeting and the summary enclosure attached to your letter dated June 1, 2009. NRC staff comments are summarized below.

As you noted in your section "Conclusions from meeting on December 18, 2008," through our joint interactions we have clearly identified construction activities which the NRC staff anticipates should not require ITAAC. We have also established a common understanding on how to treat effects of confining pressure and for which backfill parameters ITAACs are needed (i.e., SWV and compaction). As we mentioned in the May 8, 2009 meeting, in the case where the backfill source material is not known at the combined license (COL) phase, or the backfill is not fully characterized at the COL phase, additional ITAAC to confirm parameters other than SWV and compaction may be necessary to demonstrate compliance with Title 10 of the *Code of Federal Regulations*, 52.80(a). This will be evaluated on a site-specific basis.

As you stated in your letter, the SWV ITAAC is unique in some regards because of various factors and the ITAAC acceptance criteria development needs to take inherent uncertainties into account. However, as discussed below in detail regarding the proposals in your section "Recommended approach for Design Certification and COL ITAAC," these uncertainties need to be addressed during the COL review. The NRC staff has proposed some alternative approaches to minimize uncertainty. We recognize that these approaches do not totally eliminate the possible need to amend a license, if the ITAAC is not met. The following is a detailed evaluation of your proposal, along with some alternate strategies.

Regarding your discussion of design control document (DCD) Tier 1 requirements, the NRC staff position is that the provision for performing a site-specific analysis in some DCDs is already allowed by Part 52 whether or not the DCD specifically mentions that a COL applicant may propose a site-specific alternative. However, such site-specific changes would still

represent a departure from the DCD, and would need to be evaluated using the change process in the applicable design certification rule (DCR). This also applies to the situation you noted under Special Case 1 – in this instance the applicable DCR change process would also need to be followed.

Regarding the proposed SWV ITAAC, the acceptance criteria states that "An engineering report exists that concludes that the SWV within the backfill material placed under Seismic Category I structures meets [Tier 1 or site-specific value]; **or seismic design adequacy is demonstrated through site-specific SSI and structural analyses.**" The NRC staff position is that because the section in bold appears to contemplate a demonstration at the ITAAC closure stage that was not reviewed and approved by the NRC staff in its review of the COL application, it is not consistent with the format and intent of other ITAAC acceptance criteria and should be deleted from the acceptance criteria.

Also with relation to the wording of your proposed ITAAC, the wording should reflect that the SWV is "greater than or equal to," not "meets," to be consistent with other ITAAC. NRC staff understands, as confirmed by industry's statements at the meeting, that it is expected to be an infrequent occurrence that the criteria are not met. The NRC staff position is that if the ITAAC criteria are not met, the COL holder would require a license amendment to change the ITAAC; the Amendment Request would need to provide site-specific analyses to demonstrate design adequacy.

However, the NRC staff has identified several alternative approaches available to applicants wishing to reduce the risk of not meeting the ITAAC criteria. First, as part of the COL application, the applicant could perform a site-specific analysis to demonstrate that a lower SWV value is acceptable for its site and follow the applicable DCR change process. Second, a COL applicant could provide a justification or evaluation of analytical uncertainties present in its current analyses that could potentially justify a lower SWV ITAAC, and follow the applicable DCR change process. Third, there are various methods an applicant could use, such as construction of test pads, that can reduce the uncertainty associated with meeting the SWV ITAAC criteria during final construction.

Further, regarding Special Case 2, in the case where the confining pressure of a structure is not sufficient to make the site specific SWV to meet the DCD value, the site-specific soil-structure interaction and structural analyses you mentioned would need to be provided by the COL applicant and reviewed prior to COL issuance. The lower site-specific analysis assumptions for SWV could be used to justify inclusion of a lower SWV ITAAC criteria. Alternately, if the inability to meet the ITAAC value was discovered during ITAAC testing, a license amendment with the new analyses justifying a lower value could be applied for at that time.

Also regarding the proposed shear wave velocity ITAAC, the details of the measurement methods are generally appropriate for inclusion in the SAR, but the "Design Requirement," "Inspections, Tests, and Analyses," and "Acceptance Criteria" sections need to include wording similar to that in the Vogtle LWA ITAAC that specifies the locations at which the Tier 1 or site-specific value SWV is met. Sample wording is provided below. Sites with multiple Category 1 structures may wish to propose separate ITAAC for each structure to clarify the wording for each structure individually.

Design Commitment	Inspections, Tests, and Analyses	Acceptance Criteria
SWV of Category I backfill material is greater than or equal to [Tier 1 or site-specific value] at the depth of each Seismic Category 1 structure foundation and below.	Field measurements and analyses of SWV in backfill will be performed when backfill placement is at the elevation of the bottom of each Seismic Category 1 structure foundation and at finish grade.	An engineering report exists that concludes that the SWV within the backfill material placed under Seismic Category I structures at their foundation depth and below is greater than or equal to [Tier 1 or site-specific value].

Regarding your proposed backfill density ITAAC, consistent with our statements at the May 8, 2009, meeting, the wording proposed is generally acceptable.

If you have any questions or comments regarding this matter, please contact Ms. Sheryl A. Burrows by telephone at (301) 415-6086 or via e-mail at Sheryl.Burrows@nrc.gov.

Sincerely,

/RA/ George M. Tartal for

William F. Burton, Chief
Rulemaking and Guidance Development Branch
Division of New Reactor Licensing
Office of New Reactors

Project No. 689

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If you have any questions or comments regarding this matter, please contact Ms. Sheryl A. Burrows by telephone at (301) 415-6086 or via e-mail at Sheryl.Burrows@nrc.gov.

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