

April 29, 2013

Dr. Stefan Anton
Acting Licensing Manager
Holtec International
555 Lincoln Drive West
Marlton, NJ 08053

SUBJECT: HOLTEC INTERNATIONAL TOPICAL REPORT HI-2125263R0, "DYNAMIC ANALYSIS OF A FREESTANDING STACK SUBJECT TO A POSTULATED EARTHQUAKE" - WITHDRAWAL OF THE JANUARY 2013 TOPICAL REPORT (DOCKET 72-1014) (TAC L24715)

Dear Dr. Anton:

By letter dated January 24, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13028A310), Holtec International (Holtec) submitted Topical Report HI-2125263R0, "Dynamic Analysis of a Freestanding Stack Subject to a Postulated Earthquake," to the U.S. Nuclear Regulatory Commission (NRC) for review and approval under the NRC's licensing topical report program. The topical report, if approved, would be referenced in subsequent Holtec cask licensing actions.

The acceptance review was performed to determine the topical report contained sufficient technical information in scope and depth to allow the staff to begin its detailed technical review.

By letter dated April 26, 2013, you requested to withdraw the topical report from NRC review. The NRC acknowledges your request to withdraw the topical report. NRC staff activities on the review have ceased and the associated Technical Assignment Control number has been closed.

To assist in your potential re-submittal of the topical report, major areas in need of additional information are discussed in the enclosure to this letter, and are summarized below. If you choose to resubmit this topical report for review, a pre-submittal meeting is recommended.

Summary of Deficiencies with Topical Report HI-2125263R0
“Dynamic Analysis of a Freestanding Stack Subject to a Postulated Earthquake,”

Stack or stack-up refers to a configuration where the transfer cask with a loaded spent fuel canister rests atop the storage overpack during the vertical transfer of the canister from the transfer cask to the storage overpack. During the transfer operation when the transfer cask is not attached to the single-failure-proof crane, the stack-up becomes an unanchored, freestanding structure that could potentially become unstable during a seismic event.

1. Treatment of Damping

Conservative damping values for various structural materials and components are provided in NRC Regulatory Guide 1.61, “Damping Values for Seismic Design of Nuclear Power Plants.” The topical report does not use the damping values suggested in Regulatory Guide 1.61 and does not provide adequate justification for an alternative. Additionally, the topical report proposes to use analytical models to predict damping but does not either: 1) benchmark the models against experimental data or previously validated analytical solutions, or 2) require licensees using the topical to provide such benchmarking. Without such a benchmark, the staff cannot conclude whether the topical report methodology is adequate to determine the seismic stability of a freestanding stack-up.

2. Design Basis for the Mating Device Connections

The connection of the HI-TRAC and HI-STORM to the Mating Device relies on a combination of friction between the interfaces and bolt bearing to resist lateral seismic forces. However, the topical report does not discuss the design basis for the connections, how the connections are expected to perform, and how much seismic load is resisted by friction and how much is resisted by the bolts. Additionally, only a single mean value of coefficient of friction (COF) is used, and there is no discussion of uncertainty with respect to the COF or the sensitivity of the bolt loads to the COF. Without such information, the staff cannot conclude whether the connection between the HI-TRAC, HI-STORM and Mating Device will adequately resist lateral loads during a seismic event.

3. Use of the Finite Element Model

The topical report relies on a finite element model to evaluate the response of a freestanding stack-up to a seismic event. However, the topical report discussion of the finite element model does not include discussions regarding element selection, element options, element integration order, mesh density, bolt modeling, hourglass control or contact definitions. Without such information, the staff cannot conclude that the topical report provides adequate guidance to licensees using this methodology.

4. Calculation of Mean Sliding Response

The topical report computes the best estimate sliding response due to seismic input as the mean response from all time history and COF combinations, which does not provide a high confidence of a non-exceedance. The best estimate sliding response should be the maximum of the mean sliding response of the five time histories from each of the three COF values used; otherwise, it could result in a significant underestimate of response. This is consistent with the guidance provided in American Society of Civil Engineers (ASCE) Standard 43-05.

5. Acceptance Criteria for Sliding of a Freestanding Stack-up

The topical report defines the factor of safety against sliding of a freestanding stack-up on the support surface as the ratio of the maximum sliding displacement of the stack to the distance between the stack's centerline and the edge of the stack's footprint." This criterion is not acceptable because it does not consider the dimensions of the support surface upon which the freestanding stack rests and could result in the stack sliding past the edge of the support surface. The acceptance criteria must consider the limits of the support surface.

If you have any questions, please contact me at (301) 492-3315.

Sincerely,

/RA/

Daniel T. Huang, P.E., Senior Project Manager
Rules, Inspections, & Operations Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No.: 72-1014

TAC No.: L24715

Enclosure: As stated

cc: Vena Gubbi, Holtec Int'l

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