



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

October 24, 2014

Dr. Stefan Anton  
Licensing Manager  
Holtec International  
Holtec Center  
One Holtec Drive  
Marlton, NJ 08053

SUBJECT: FIRST REQUEST FOR ADDITIONAL INFORMATION FOR THE HOLTEC INTERNATIONAL HI-STORM UMAX CANISTER STORAGE SYSTEM, CERTIFICATE OF COMPLIANCE NO. 1040, AMENDMENT NO: 1 (TAC NO: L24938)

Dear Dr. Anton:

By letter dated July 11, 2014, Holtec International (Holtec) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to amend the HI-STORM UMAX Canister Storage System, Certificate of Compliance No. 1040. The proposed amendment application introduces a seismically enhanced version of the HI-STORM UMAX model, labeled "Version MSE" (abbreviation for the Most Severe Earthquake (MSE)). This model is intended to meet the requirements of the California Coastal Commission for new facilities at certain coastal locations.

The NRC staff has reviewed your application and has determined that requests for additional information (RAIs) are required to complete its detailed technical review. The RAIs are provided in the enclosure to this letter. We request that you provide the information by November 13, 2014. Please inform us in writing at your earliest convenience, but no later than October 31, 2014, if you are not able to provide the information by the requested date. You should also include a new proposed submittal date and the reasons for the delay to assist us in re-scheduling your review.

Please reference Docket No. 72-1040 and TAC No. L24938 in future correspondence related to this licensing action. If you have any questions, please contact me at (301) 287-9250.

Sincerely,

**/RA/ H. Akhavannik for**

John Goshen, P.E., Project Manager  
Spent Fuel Licensing Branch  
Division of Spent Fuel Management  
Office of Nuclear Material Safety  
and Safeguards

Docket No.: 72-1040  
TAC No.: L24938  
Enclosure: As stated

**REQUEST FOR ADDITIONAL INFORMATION  
HOLTEC INTERNATIONAL  
DOCKET NO. 72-1040  
AMENDMENT NO. 1  
HI-STORM UMAX CANISTER STORAGE SYSTEM**

By letter dated July 11, 2014, Holtec International (Holtec) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to amend the HI-STORM UMAX Canister Storage System, Certificate of Compliance No. 1040. The proposed amendment application introduces a seismically enhanced version of the HI-STORM UMAX model, labeled "Version MSE" (abbreviation for the Most Severe Earthquake (MSE)). The NRC staff (staff) reviewed your application and determined that requests for additional information (RAIs) are required to complete its detailed technical review.

Chapter 3 Structural Evaluation

**RAI 3-1**

Explain accuracy and validity of values shown in Table 9.4 of HI-2125239 (Rev. 1), "Minimum Safety Factor for the SFP under the MSE Condition."

Provide justification for using a simple ratio of peak seismic load applied to the Support Foundation Pad (SFP) to determine the factor of safety. In the new analysis, the design basis earthquake accelerations are applied at a new SFP level, which is at 25 feet (ft.) below grade. In the previous Generic Analysis Model, accelerations applied were at the Bedrock level 100 ft. below grade. Demonstrate that the approach used in the current analysis for the MSE condition (including the resulting amplification of the seismic accelerations) is appropriate and meets the regulatory seismic analysis and design requirements.

This information is required to verify compliance with 10 CFR 72.212(b)(5).

**RAI 3-2**

Justify and demonstrate that concrete cracking will not reduce the frequencies of the embedded structures, thereby, increasing the damping and as a result potentially decrease or increase the seismic demand.

In previous analysis of HI-STORM UMAX, the applicant used NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," and the staff accepted this approach. NUREG - 0800 endorsed the approaches described in ASCE/SEI 43-05, "Seismic Design Criteria for Structures, Systems, and Components in Nuclear Facilities," and ASCE 4-98, "Seismic Analysis of Safety-Related Nuclear Structures," as reasonable and acceptable to address the issue of effects of concrete cracking on embedded structures. Similar performance characteristics apply to the concrete structure in the HI-STORM UMAX MSE system, therefore, the staff finds that it can be used for this application. The current amendment did not address the issue of effects of concrete cracking on potential increase in seismic demand on embedded structures. The staff needs this information to verify that the structural integrity will still be maintained.

This information is required to verify compliance with 10 CFR 72.212(b)(5).

Enclosure

**RAI 3-3**

Provide the location of the new analysis for HI-STORM UMAX, Version MSE, Reference Number [13] of calculation HI-2125239 (Rev. 1) and explain how this analysis has been used in this amendment request. Provide pertinent pages of this reference, as applicable.

Reference Number [13], "Design Aids in Soil Mechanics and Foundation Engineering," Shenbaga R. Kaniraj, is listed on page 6 of 71 of calculation HI-2125239 (Rev. 1). The application does not provide context for the use of this reference and staff cannot evaluate its usage and impact on evaluating the performance of the system during normal, off-normal, or accident conditions. If this reference has been used in this amendment request, provide the information for allowing the staff to verify the validity of the information in order to ensure the safety of the structure. If it is not used, remove the reference and update the reference list.

This information is required to verify compliance with 10 CFR 72.236.

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Docket No.: 72-1040

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Enclosure: As stated File Location: G:\SFST\HI-STORM UMAX\Amendment 1\RAI 1

**ADAMS: ML14297A022**

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