March 26, 2009

Ms. Tammy Morin,
Acting Licensing Manager
Holtec International
Holtec Center
555 Lincoln Drive West
Marlton, NJ 08053

SUBJECT: ACCEPTANCE REVIEW OF RESPONSE TO SECOND REQUEST FOR ADDITIONAL INFORMATION ON HI-STORM 100U SYSTEM, LICENSE AMENDMENT REQUEST 1014-6 (TAC NO. L24085)

Dear Ms. Morin:

By letter dated April 27, 2007, as supplemented June 12, July 14, and December 19, 2008, Holtec International (Holtec) submitted an amendment request to the U. S. Nuclear Regulatory Commission (NRC) for the HI-STORM 100 dry cask storage system Certificate of Compliance (CoC). The amendment proposes to add an underground storage overpack that provides an alternative Vertical Ventilated Module (VVM) design to be used with the Holtec multi-purpose canisters (MPC) and the HI-TRAC transfer cask. On December 4, 2008, the NRC staff issued a second request for additional information (RAI) for the proposed amendment. Holtec provided its responses to the RAIs on January 16, and February 6, 2009.

The staff has reviewed the responses and has determined that Holtec did not provide adequate evaluations for the following three specific cases:

- Response 3-9: No information was provided to demonstrate that the design for the support foundation and top surface pad had been analyzed and evaluated for all applicable load combinations.
- Responses 3-2 and 11-1: An accident analysis related to excavation activities proximate to an existing array of VVMs has not been performed to evaluate the stability of the support foundation and soil within the Radiation Protection Space (RPS).
- Responses 3-2 and 11-1: The addition of a retaining wall between the support foundation and top surface pad to provide a structurally competent barrier to prevent soil instability within the RPS during excavation constitutes a modification to the design that has not been analyzed.

The staff has determined that the other responses provided in the January 16, and February 6, 2009, letter were generally acceptable, but can only proceed with the amendment request evaluation by providing specific constraints and conditions in the amendment 7 CoC and Technical Specifications (TS). Additionally, an analysis and evaluation of the top surface pad for all applicable loads for the selected bounding parameters of this substrate material must be performed by Holtec and submitted to the NRC for evaluation by April 6, 2009, in order for the evaluation process to stay on schedule. The details of the staff's evaluation and these constraints and conditions are provided below.

Parts 72.3, 72.24(d) and 72.212(b)(3) of 10 CFR require the applicant to analyze and evaluate a design and determine the specific controlling parameters for that design, so that the general licensee can determine whether the site specific parameters are enveloped by the design parameters. These requirements must be contained in the applicant's Final Safety Analysis Report (FSAR). After two series of RAIs the staff finds that the application did not adequately meet these requirements for the cases identified above. Specifically, the applicant did not adequately analyze and evaluate all of the components important to safety (ITS) within the design to determine all of the controlling parameters for the design. Without a determination of all the controlling design parameters the general licensee will be unable to determine if the site parameters are enveloped by the controlling parameters for the design.

Response 3-9

The analysis and evaluation of all ITS components of the design is the minimum information that must be included in the FSAR per 10 CFR 72.24(d). In response to the second RAIs, dated January 16, 2009, the applicant provided a design for the top surface pad and the support foundation. However, no information was provided to demonstrate that the design was analyzed and evaluated for the combination of loads to which the HI-STORM 100U System will be subjected. These loads include dead load, live load, seismic load and long-term differential settlement. Instead, the applicant shifted the responsibility for the analysis and evaluation of the design to the general licensee as described in the proposed TS changes to Sections 3.4-8 and 12. Neither the regulation, nor the licensing/rulemaking process, allows the general licensee to assume the obligations of the CoC holder.

In the absence of an analysis and evaluation of all ITS components of the design for specific or bounding site parameters that include site soil characteristics, the staff is required to restrict the present design of the support foundation to sites where the support foundation rests directly on bedrock or on substrate material having a shear wave velocity equal to or greater than 3500 feet per second (fps). For these controlling parameters, the internal forces in the support foundation due to dead load, live load, seismic load and long-term differential settlement are minimal and, as such, the design as discussed in TS Table 3-3 is acceptable. However, any deviation from the support foundation being directly supported on bedrock or on substrate material having a shear wave velocity equal to or greater than 3500 fps will require the applicant to submit an amendment to the CoC.

Responses 3-2 and 11-1

The top surface pad that supports the weight of the transporter during loading operations rests on the substrate material between itself and the support foundation. An analysis and evaluation of the top surface pad for all applicable loads for the selected bounding parameters of this substrate material must be performed by Holtec and submitted to the NRC for evaluation by April 6, 2009, in order for the evaluation process to stay on schedule.

Responses 3-2 and 11-1

The applicant provided a proposed TS Appendix B paragraph 3.4.9 that states the "Radiation Protection Space (RPS)… is intended to ensure that substrate material… remains essentially intact under all service conditions including during an excavation activity adjacent to the RPS. A retaining wall at the edge of the RPS shall be constructed to prevent possible loss of shielding

within the RPS during excavation under any credible event such as human error or an earthquake. If possible, the RPS retaining wall(s) shall be keyed to the reinforced concrete pads at the bottom and top of the VVM. The retaining walls shall be important-to-safety and shall be designed to comply with a national consensus standard (such as ACI 318 (2005))." The addition of the retaining wall(s) constitutes a modification to the design that can significantly alter the structural response of the system due to the application of the design loads. This is particularly true of the seismic response where the addition of the retaining wall(s) will alter the relationship between an array's center of mass and its center of resistance, introducing additional rotational components to the response that have not been considered. This modified design has not been analyzed and evaluated by the applicant. In addition, no accident evaluation has been performed for construction and excavation activities taking place next to an array of loaded VVMs. Therefore, to ensure the stability and integrity of the soil within the RPS, the staff requires that no excavation activities associated with the construction of new VVMs shall take place within a distance from the RPS equal to ten times the depth of the planned excavation. The staff shall provide appropriate language to the CoC and TS to capture this requirement.

Response 9-1, Acceptance criteria and Maintenance

Holtec proposes to restore the ANSI N14.5 Helium leakage rate check test of the MPC fabrication welds to FSAR sections 2.0, 2.2, and 9.1. This applies to all HI-STORM 100 Systems identified in CoC 1014. The staff finds this acceptable. The staff shall provide appropriate language to the CoC and TS to capture this requirement.

Administrative Recommendations

The HI-STORM 100U System is proposed to be licensed as an amendment to CoC 1014. Due to the uniqueness of this system along with its specific TS requirements, CoC 1014 Amendment 7 will be modified to make it applicable to only the HI-STORM 100U System. Future amendments to the HI-STORM 100 CoC that are applicable to the underground system only will be identified by alpha-numeric designations CoC 1014 Amendment 7.A, 7.B, 7.C, etc. The corresponding TS will identify the specific applicable CoC revision in the footer of each TS page. Holtec should consider following a similar approach by maintaining an FSAR assigned specifically to the HI-STORM 100U system.

The details of this letter have been discussed with Holtec staff in telephone conversations made on March 23, and 24, 2009.

Please reference Docket No. 72-1014 and TAC No. L24085 in future correspondence related to this licensing action. If you have any questions, please contact me at (301) 492-3325.

Sincerely,

/RA/

John Goshen, PE, Project Manager
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No: 72-1014

TAC No: L24085

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