July 20, 2007

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

SUBJECT: RESPONSE TO HOLTEC'S JULY 10, 2007, LETTER RELATED TO NRC'S REVIEW OF THE HOLTEC HI-STAR 180 APPLICATION (TAC NO. L24076)

Dear Dr. Anton:

I am writing in response to your letter dated July 10, 2007. In that letter you provided your synopsis of the main points made by Holtec in the July 5, 2007, meeting with U.S. Nuclear Regulatory Commission staff. Based on the results of our acknowledgment review of Holtec's April 11, 2007, Hi-Star 180 application, we found it to be a substantial improvement when compared to Holtec's original application, which you chose to withdraw by letter dated March 9, 2007. However, we also found that we were still unable to make a determination that the application provided sufficient information to proceed with the review. Thus we requested a meeting to provide you with an opportunity for you to clarify your positions in several areas.

This meeting did provide us a clearer understanding of what Holtec intended to communicate in its application with respect to structural analyses assumptions, the suitability of Metamic as a structural material, and an approach to justify moderator exclusion. As a result of Holtec's presentation we conclude that the application does contain sufficient information to initiate a technical review provided that the application reflected the clarifying information presented by Holtec in our July 5, 2007, meeting. Therefore, we will begin our technical review of Holtec's HI-STAR 180 application when Holtec has provided these clarifications. I have enclosed a copy of our meeting summary for your use and I have provided below some general comments on your letter of July 10, 2007.

Observations on your comments in your July 10, 2007, letter:

1. Material Design Data:

   You stated that based on the Metamic creep test data provided in the safety analyses report (SAR) the upper bound estimate of the total creep in the basket panels after one year in the horizontal position with a loaded basket is only 0.066 percent, equivalent to a basket deflection of 0.015 inches. Further, you noted that additional data acquired over the past two months corroborates Holtec's position that creep is not a controlling design parameter. Finally, you stated that additional data cannot hurt.

From our perspective, the data provided thus far does not provide a high degree of confidence that Metamic will perform as intended for extended periods when exposed to elevated temperatures. However, we are aware that Holtec is continuing to collect applicable data and, we found the clarifying information presented in the July 5 meeting to be helpful in moving forward with an evaluation in this area.

2. Structural Analyses:

You stated that Holtec benchmarked its LS-DYNA analytical model with a quarter-scale physical test. You further stated that while there was an error in a scale model test report identification number you believed “that this editorial error would not have stymied the reviewer if he were familiar with the quarter-scale test program (which continues to be used by people from the NRC and the labs in their cask dynamics work).”

As we explained in the July 5, 2007, meeting, Interim Staff Guidance (ISG)-19, “Moderator Exclusion Under Hypothetical Accident Conditions and Demonstrating Subcriticality of Spent Fuel Under the Requirements of 10 CFR 71.55(e),” provides guidance for cask qualification that includes physical testing of a cask model that incorporates the bolt closure system. This approach ensures that the interaction among the bolt closure system, the impact limiter and impact limiter attachment hardware is captured. It also ensures that the impact limiter hardware has been adequately designed to maintain the attachment of the impact limiter to the cask during and after the test. Holtec has elected not to perform such a physical test. Instead Holtec proposes to benchmark a full-scale LS-DYNA finite element model against the previous test results of a quarter-scale HI-STAR 100 model.

We recognize that a properly constructed LS-DYNA model can effectively duplicate the rigid body deceleration time history of the tested cask, as well as the crush depth of the impact limiter. However, such a model can lack the behavioral sophistication to duplicate the failure modes that might occur in a physical test, such as the failure of the impact limiter attachment hardware. This is precisely what the staff discussed at the public meeting of March 27, 2007, regarding modeling bias, whereby the LS-DYNA analyst might unintentionally incorporate bias into the model, based on his/her perception of behavior, that does not allow the model to behave as it would in a physical test. Because Holtec will replace the physical test with a computer simulation, the benchmark must clearly demonstrate that the LS-DYNA computer model can duplicate test failures as well as test successes.

We expect Holtec’s benchmark submittal will contain sufficient test photographs, impact limiter dimensioned drawings and connection details for the attachment of the impact limiter to the test overpack, accelerometer attachment locations and explanation for why some accelerometer data may not have been used. In addition the benchmark should contain a detailed discussion of the methodology used to construct the LS-DYNA model from the impact limiter drawings and attachment details, attachment bolt mechanical properties and honeycomb data. The benchmark should also include discussion of any shimming that may have been done, the selection of coefficients of friction and other such details.

Should you have any questions regarding this matter please do not hesitate to contact me, at telephone number (301) 492-3310 or Dr. Gordon Bjorkman of my staff at telephone number (301) 492-3298.

Sincerely,

/RA/

Edwin Hackett, Deputy Director
Technical Review Directorate
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Enclosure: July 5, 2007, Meeting Summary

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Edwin Hackett, Deputy Director
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Enclosure: July 5, 2007, Meeting Summary

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