June 30, 2009

MEMORANDUM TO: Nader Mamish, Deputy Director
Licensing and Inspection Directorate
Division of Spent Fuel Storage and Transportation, NMSS

FROM: Pierre Saverot, Project Manager **/RA/**
Licensing Branch
Division of Spent Fuel Storage and Transportation, NMSS

SUBJECT: SUMMARY OF JUNE 18, 2009, MEETING WITH HOLTEC INTERNATIONAL REGARDING THE HI-STAR 180 PACKAGE APPLICATION

Summary

On June 18, 2009, Holtec International, Inc. (Holtec) met with staff to resolve remaining technical issues from the Request for Additional Information (RAI) dated June 5, 2009, and reinforce the "path forward" generally agreed to during several teleconference calls held over the past two weeks. The discussion centered on the Metamic qualification studies, as well as the structural, thermal, and containment's findings by staff. Staff indicated that it remains open to having additional teleconference calls in the coming days to ensure the receipt of complete and satisfactory RAI responses.

Discussion

Material Qualification Program for Metamic HT

The RAIs addressed a number of topics, including sampling population, irradiated materials, statistical analysis tables, Minimum Guaranteed Values (MGV) being not appropriate for certain properties, lot-to-lot variability, Metamic HT sampling plan, etc.

Holtec indicated that the Metamic HT Sourcebook will be extensively revised and will incorporate the following changes as an integrated response to all RAIs: (i) the use of the statistical approach is abandoned to eliminate concerns of data scatter and lot-to-lot variability, (ii) the MGV is now required to be less than the minimum measured value of the property, (iii) additional coupons test results with separate data sets of 30 coupons for as-extruded, thermally aged and irradiated coupons at different temperatures, and (iv) an expanded production sampling plan.

Staff indicated that this revised program looks "great on the surface," moves closer to the way the Code approaches things and provides substantial strength in Holtec's arguments. Staff stated that it was hard to correlate the creep rate with the failure strain and Holtec said that it will "fix" the creep equation. Staff requested more details on the application of MIL – STD- 105 as the procedure for the measurement of quality attributes of production lots and for obtaining samples from the extrusions.

Structural Design Considerations

Holtec presented its proposed responses to the 15 structural RAIs. Staff stated that RAI 2-1 provides a "link" to the HI-STAR 60 package so that both the HI-STAR 180 and HI-STAR 60 packages will show that LS-DYNA is conservative. Staff asked what was the purpose of using the "automatic-eroding-single-surface" contact option and Holtec answered that this was the best possible choice. Regarding the value assumed for the dimension of the interstitial space between the single fuel pin model and the contact boundary, staff reiterated its position on Holtec being diligent in its approach to ensure that there is enough margin between the peak strain value of 1.4% versus the 1.7% limit. Staff also stated that filtering in dynamics Finite Element analysis is somehow "suspect" regarding the difference in peak G loads, and said that having a detailed explanation of the rationale chosen to decide where to extract information will be helpful. Staff explained that RAI 2-5 goes back to the question of not minimizing plastic deformation. Regarding the revision of the basket panel deformation criterion in dimensionless form, staff said that Holtec should verify that this new criterion does not "wash out" critical information in the rest of the SAR. Regarding RAIs 2-8 and 2-9, Holtec stated that the sensitivity study regarding the performance of solid shell elements versus solid elements will be incorporated into the SAR and that there is good agreement from the results of the ANSYS and LS-DYNA simulations, the latter including the impact limiters while the ANSYS model does not.

Thermal Evaluations

Holtec will perform a detailed CFD Time-To-Boil analysis, which will be documented in the calculation package i.e., not in the SAR, using 120ºF as the initial water temperature. Holtec will develop a 3-D-Fluent model to model the stack of panels separated by a uniform gap of 0.5 mm, credit conduction and radiation through the helium gaps in the panels and determine the effective thermal conductivity of the basket panels in the axial directions at various temperatures. Holtec will perform a fire analysis with an emissivity of 0.8 or greater for all surfaces exposed to the fire and an emissivity of 0.66 for post-fire analyses consistent with the HI-STAR 100 design. Holtec confirmed that Tables 3.1.1 and 3.1.3 will be revised to include all containment boundary seals.

Containment Evaluation

Holtec presented two methods for testing the inner lid seal, one without having to remove the outer lid in an answer to staff's concerns that it was unclear how the outer seals of the inner lid and vent and drain ports could be tested using the inter-seal test port plug. Staff stated that both methods shall be incorporated to the SAR, that the second method is the "most troubling" at this point and requested Holtec to provide a detailed description of the testing sequence along with a justification of the operating steps. In particular, staff wondered how to ensure that helium will be present during the test, what could be measured if there is a leak in the outer seal of the inner lid, i.e., if a small amount of helium escapes. Holtec explained that such tests will be performed both for acceptance testing at the manufacturing facility and for pre-shipment, periodic and maintenance testing in accordance with Part 71 regulations. Staff requested Holtec to fully describe the periodic and maintenance leakage rate tests in Chapter 8 to ensure consistency with ANSI N14.5.

Regarding Package Operations, staff said that the description of the vacuum drying or helium forced dehydration was still unclear. Staff also indicated that the MNOP inter-lid space is above 5 psig and that a pressure testing of the containment system is required. Holtec agreed to include such a requirement in the Acceptance Tests of the package.

Holtec indicated that the application will be thoroughly reviewed for package manufacturing flexibility and to avoid any cross referencing from one Chapter of the SAR to another so that all of the information is not “de facto” incorporated into the Certificate of Compliance. Holtec also agreed with staff that Section 9 of ASME should not be referenced because it is not a welding code. Staff agreed with Holtec’s proposed response to an RAI regarding the use of “NITS weld” or “non-ASME weld” terminology instead of the phrase “non-code weld.”

The enclosures are the list of meeting attendees, and a copy of the slides Holtec presented at the meeting.

Docket No. 71-9325
TAC No. L24304

Enclosures:
1. List of Meeting Attendees
2. Presentation Slides

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Distribution: NRC Attendees

ADAMS Package No.: ML091820020

OFC	SFST	C	SFST	C	SFST			
NAME	PSaverot		MDeBose		EJBenner			
DATE	06/29/2009		6/30/09		6/30/09			

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C=Without attachment/enclosure E=With attachment/enclosure N=No copy **OFFICIAL RECORD COPY**

Meeting Between HOLTEC International and the Nuclear Regulatory Commission
June 18, 2009
Meeting Attendees

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