November 24, 2008

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 NOVEMBER 12, 2008, MEETING WITH HOLTEC INTERNATIONAL REGARDING PROPOSED RESPONSES TO THE OPEN TECHNICAL ISSUES FOR THE HI-STAR 180 PACKAGE

Summary

On November 12, staff met with Holtec International, Inc. (Holtec), for the third and last pre-application meeting to discuss the HI-STAR 180 transport package, prior to submittal of a new stand-alone application for a certificate of compliance. Holtec still plans on having its submittal ready by the end 2008. The discussion centered on open technical issues resulting from the initial submittal, particularly the staff's structural questions. Teleconferences have been scheduled to address containment, thermal, criticality and shielding issues. Staff encouraged Holtec to ensure that the application is of high quality by having a sufficiency review performed by a third party prior to submittal.

Discussion

The technical discussion focused on the following issues: Impact Limiter Benchmarking, Metamic HT Testing, and Structural Open Technical Issues.

Impact Limiter Benchmarking

- Benchmarking was revised from tetrahedron to hexahedron elements; the mesh sensitivity was analyzed multiple times with different element sizes for three impact conditions (normal compression, off-axis compression, shear load) and it was found that the crush behavior is insensitive to the element size. The effect of secondary strength properties on the impact limiter performance was also found to be insignificant in a series of drop simulations.

- Holtec acknowledged that taking data from the HI-STAR 100 physical tests and using the benchmarking model for the HI-STAR 180 was a "giant leap of faith in modeling" which set the bar too high. Holtec is now "coming back to something more modest" and believes that the work done in recent months will be very valuable for other new cask designs.

- In an answer to staff's questions, Holtec said that the strain levels reached in a 30ft drop approach 60% and that the most adverse slapdown angle was 7º.

Metamic Testing

- Testing is still in progress, there have been delays in the schedule due to the "sample irradiation process," but Holtec said that testing will be completed within 30 days. Staff asked where and how "irradiation testing" was being done but could not get a satisfactory answer.

Structural Open Technical Issues

- Structural Open Technical Issues (OTIs) were previously discussed on June 27 and September 2, 2008 and Holtec said that its approach on the structural qualification has changed. Staff recalled issues with hourglassing, mesh sensitivity, material failures, and that some analytical calculations could not be done due to a lack of appropriate benchmarking. Staff also cautioned Holtec in using empirical equations and said that, if used, those equations need to be justified.

- Holtec answered a staff question by saying that bolts are "linked elements" in the ANSYS model and that a "layer of conservatism had been incorporated." However, staff said that penetration and non-physical deformation are still troublesome issues.

- Staff has no disagreement with the proposed resolution of OTI 2-2 (different result if acceleration output is filtered rather than the differentiated velocity output being filtered) but said that benchmarking should be done to determine which parameters are important. In answering staff's question, Holtec said that there is a bonded contact for connection of the impact limiter to the overpack. Holtec and staff agreed that OTI 2-11 on the mesh sensitivity of the bolt model now goes away since there is no objective to validate the details of the attachment of the bolt model. At that point, the mindset is to make conservative predictions even if OTI 2-11 may have to be revisited in the future. OTI 2-12 on the justification of minimum reduction of area values in a stage 3 benchmark for impact limiter bolts also goes away now (the attachment bolt is out of the scope for benchmarking) but staff still needs to know if the impact limiter can detach during a drop test.

- Regarding OTI 2-16 (justification of methodology change), staff reiterated that this was a very important point to consider in the write-up of the new submittal. Regarding OTIs 2-18 and 2-19 (explanation of severe local panel deformations and strains observed), Holtec said that it is not longer relying on LS-DYNA as a definitive analysis (LS-DYNA is used for analyzing the gap, and the stress results for the basket are derived from ANSYS) and that the fuel basket has been strengthened. Staff suggested that Holtec considered providing a detailed and explicit write-up of what it is doing for the modeling of the gap and

of the pin drop. Regarding OTI 2-25 (revision of the puncture drop analysis), staff said that Holtec needs to provide a justification of what is modeled, e.g., if the nodes are merged or not. Regarding OTI 2-57 (justification of the 15 ft-lb as Charpy energy), staff said that Holtec cannot use an ASME code that has no 15 ft-lb Charpy energy for SA352-LCC.

- Staff remains concerned about the use of analyses which do not include any detailed bolt model as well as by the lack of testing. Staff said that it "needs reasonable assurance that closures are sufficient" and reiterated that it will "scrutinize this issue to have a complete justification on bolt design or that the modeling is sufficiently justified in addition to the gaps."

- Staff cautioned Holtec on the use of the word "storage" in a Part 71 application. Staff said that Part 71 and Part 72 include different regulatory requirements and believes that Holtec does not want to go into long term testing to justify its arguments and position in reference to the basket material creep. Staff reiterated that Holtec is only applying for a Part 71 license and that Part 72 issues such as the basket cumulative creep life data, the metallic seal issue, the maintenance procedures for verification of integrity, and the time limited aging analysis are not considered in a Part 71 submittal. Staff also cautioned Holtec in having statements such as "torque values for both inner and outer closure lid bolts are subject to change per seal manufacturer recommendation."

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. L24246

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

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Distribution: NRC Attendees

OFC	SFST	C	SFST	C	SFST			
NAME	PSaverot		MDeBose		EBenner			
DATE	11/18/2008		11/19/08		11/24/08			

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

Meeting Between HOLTEC International and the
Nuclear Regulatory Commission
November 12, 2008
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