



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

January 30, 2018

MEMORANDUM TO: Anthony H. Hsia, Deputy Director  
Division of Spent Fuel Management, NMSS

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

SUBJECT: SUMMARY OF JANUARY 23, 2018, MEETING WITH HOLTEC  
INTERNATIONAL

Background

Holtec requested this meeting to present a new version of the Model No. HI-STAR 100 package, which was initially licensed in 1998, to transport high burn up fuel in either a multi-purpose canister (MPC) or in a basket. The application for this new package, designated as HI-STAR 100MB, will be submitted in February 2018.

The meeting was noticed on December 21, 2017 (ML17355A002). The meeting attendance list and presentation are provided as Enclosure Nos. 1 and 2, respectively.

Discussion

The Model No. HI-STAR 100MB is a new package, with a high heat load, designed for the transport of high burnup fuel, whereas the HI-STAR 100 is currently limited to spent fuel with a burnup of 45 GWD/MTU and a 20 year cooling time. The HI-STAR 100MB will feature the same cavity inner diameter than the HI-STAR 100, thus allowing, in the future, the transportation of currently licensed HI-STAR 100 or HI-STORM 100 MPCs. The HI-STAR 100MB will have either a single lid for MPCs or a double lid for bare baskets (the second bolted lid providing the additional water barrier for moderator exclusion under hypothetical accident conditions (HAC)). Apart from the different cask lengths for MPCs and bare baskets, the construction of the cask body and of the top forging are identical in each version.

The pending application will only include at this time the MPC-32M (M stands for Metamic) and the F-24M and F-32M bare baskets for either 24 PWR or 32 PWR fuel assemblies.

In the structural evaluation, some pairings that were not limiting were screened out, and critical drop orientations (due to the different weights and lengths of the packages compared to previously approved packages such as the HI-STAR 180, HI-STAR 180D, and HI-STAR 190) were clearly identified. Staff requested a full justification for all bounding case scenarios and asked Holtec if they were going to leverage the two-step approach for the HI-STAR 100MB, considering it is an amendment of the HI-STAR 100, or if they were going to use the LS-DYNA approach that was previously used for the HI-STAR 190.

Staff noted that the HI-STAR 100 used a two-step process in which an LS-DYNA model was used to determine the deceleration values for the various drop heights and orientations, and those values were subsequently used as the inertial load in an ANSYS model to determine deformation, stress, strain, etc. Staff also noted that the HI-STAR 190 used a different one-step approach while including the justifications required. Holtec responded that the one-step LS-DYNA approach will be used in this application; staff is thus expecting Holtec to create an LS-DYNA model for the HI-STAR 100MB and use it to determine the response of the package due to impact events (deformation, stress, strain, etc.). Staff is not expecting Holtec to determine deceleration values and compare them to those of the HI-STAR 100. This approach, while justified and approved for other applications, would be new for this package; thus staff expects a full analysis because there shall be no commingling of approaches between different packages such as the HI-STAR 190 and the HI-STAR 100.

The thermal analysis bounding case will be for the bare basket, which is shorter than the MPC and has a higher heat load. Staff reminded Holtec that HAC initial thermal conditions shall use normal conditions of transport (NCT) conditions with solar heat and that, if a gap is modeled, the gap has to be shown on the licensing drawing. The shielding evaluation will feature MCNP5 dose rate calculations and Triton/Origen/Origami (Scale 6.21) source term calculations. Staff noted that the application should include a discussion of the dose rates contributed by the secondary gammas created by the (n, gamma) reactions. Staff also stated that the application should include a discussion of the burnup profile and its impact on gamma and neutron source strengths along the axial direction of the fuel since Triton/Origen/Origami do not provide that information along the axial direction. The criticality safety evaluation will utilize ISG-8, Rev.3, for burnup credit and have the same loading curves than those of the HI-STAR 190. Staff underlined the need to read carefully the Appendix of ISG-8. Finally, Holtec confirmed that ANSI N14.5 (2014 edition) will be used in this application, and staff reminded Holtec to demonstrate that the package maintains leaktightness on the entire containment boundary.

Holtec stated that (i) Amendment 11 is focused on the design approval for this new package, (ii) Amendment 12 will be primarily a shielding review with a change of content's burnup and enrichment, and is likely to be submitted during the course of the technical review of Amendment 11, and (iii) future amendments will be submitted later for other MPCs currently qualified for the HI-STAR 100 and the HI-STORM 100 packages.

A member of the public asked a question on the transportation of canisters previously in storage; since this question was not related to this pending application, staff responded by mentioning the technical review, performed during the licensing of the Model No. HI-STAR 190, on aging considerations of MPCs, inspections to be performed, and MPC maximum flaw sizes tolerated in accidental conditions for such transport to take place. Staff made no regulatory commitment during the meeting.

Docket No. 71-9261  
EPID L-2018-LLA-0001

Enclosures 1. Meeting Attendees  
2. Presentation

SUMMARY OF JANUARY 23, 2018, MEETING WITH HOLTEC INTERNATIONAL,  
DOCUMENT DATE: JANUARY 30, 2018

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Presentation 01-23-2018

**ADAMS Package No.: ML18030A942**

<b>OFC</b>	SFM	E	SFM	C	SFM			
<b>NAME</b>	PSaverot		SFiguroa		MRahimi			
<b>DATE</b>	01/24/2018		01/25/2018		1/30/2018			

**OFFICIAL RECORD COPY**

**Meeting Between HOLTEC and the  
Nuclear Regulatory Commission  
January 23, 2018  
Meeting Attendees**

**NRC/NMSS/SFM**

Pierre Saverot  
John Wise  
Yong Kim  
Steve Everard  
Christina Leggett  
Zhian Li  
Jimmy Chang  
Dan Forsyth  
John Nguyen  
Chris Bajwa  
Travis Tate

**HOLTEC**

Stefan Anton  
Chuck Bullard  
Joyce Tomlinson

**MEMBER OF THE PUBLIC**

Donna Gilmore