



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

September 7, 2018

MEMORANDUM TO: Aida Rivera-Varona, Acting Deputy Director
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

FROM: Pierre Saverot, Project Manager /RA John McKirgan Acting for/
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

SUBJECT: SUMMARY OF AUGUST 24, 2018, MEETING WITH HOLTEC
INTERNATIONAL

Background

On September 23, 2015, Holtec International (Holtec) submitted an application for the Model No. HI-STAR ATB 1T package. The staff issued a request for supplemental information letter dated November 10, 2015. Meetings were held on November 24, 2015, January 19, and March 16, 2016, on a benchmark test program, the general acceptability of the test model, and test sequences. Drop tests were conducted at Sandia National Laboratories on September 12-14, 2016, and Holtec submitted a new application by letter dated February 6, 2017. A request for supplement information (RSI) was issued on March 21, 2017, followed by two requests for additional information (RAI) on August 9, 2017, and May 29, 2018. Holtec requested this meeting to discuss the approach it will take to respond to this second round of RAIs.

The meeting was noticed on August 8, 2018 (ML18218A306). The meeting attendance list and the presentation are provided as Enclosures Nos. 1 and 2, respectively.

Discussion

The Model No. HI-STAR ATB 1T package is a rectangular package, 3.7 m long, 1.8 m wide, and 2.9 m high, with a gross weight of 116 metric tons. The package, which does not have any impact limiters, is designed for the transport of up to 12 tons of Greater Than Class C (GTCC) waste, such as core grids, core shrouds, shroud heads, top guides, etc.

The second round of RAIs focused on containment (sealing surface plastic deformation and gaskets tests program) and the structural qualification of the package using strain-based acceptance criteria. The application, as submitted, included plastic deformation in the closure region, in contradiction with Section 4.5.3 of NUREG-1609 that states that it should be verified that the containment boundary does not undergo any inelastic deformation. During the meeting, Holtec proposed removing the current sealing surface plastic deformation, by combining higher strength materials with package design modifications.

Staff and the applicant discussed the proposed responses of every RAI, as shown in the presentation included in Enclosure 2.

Regarding the parameters used to model concrete in LS-DYNA, staff noted the applicant shall provide additional information on the derivation of properties based on those of the test site at SNL or perform a sensitivity analysis for the variation of the concrete parameters. Staff said that a bill of materials should not include the wording "or better" for material specifications because it is ambiguous: material specification should be clear and precise.

Regarding the plastic strain reported for the top end puncture simulation, staff requested a clear explanation of the strains observed in the model versus those reported in the application. For strain based acceptance criteria, as used in this application, staff noted that ASME Appendices EE and FF do acknowledge numerical singularities but that the user has also to develop a definition, i.e., acceptance criterion, of a numerical singularity, and justify its application during the analyses. The user must provide material test data to support material properties such as uniform strain values. Staff noted that Holtec calculated uniform strain values rather than provide test data based on a sample size of at least 5 tests to support a 98% exceedance probability value for a true uniform strain limit. Staff observed that there are very few publications showing strain rate curves for Nitronic 50, to determine a 98% exceedance rate. Staff also observed the 2017 ASME edition was available in addition to the 2013 edition.

Staff stated that the thermal RAI was necessary because of the limited test report that was provided in the application. The applicant stated it will analyze any shearing or weakness associated with the hollow O-rings for both normal and accident conditions. Staff also noted that the margins to the allowable temperatures are very small and that Holtec shall address the cumulative damages due to a 30 foot top down center of gravity over corner drop followed by a 1 foot puncture accident.

The applicant said that the inelastic strain in the sealing surfaces of the package will be eliminated by adding high strength Incoloy cladding in the top flange and the closure lid, and by modifying the package design, although it is acknowledged that welding may be a burden on the fabrication side. Holtec will be analyzing options numerically and probably choose the one with no geometric discontinuity between the inner and outer seals. Staff reminded Holtec that NUREG-1609 is unambiguous on the absence of plastic deformation, and suggested that the application clearly states that the closure design "never loses any sealing capability" during both normal and accident conditions. Holtec confirmed the use of a pre-shipment leak test and said that their proposed RAI response was poorly worded. Regarding shielding, the changes made by Holtec appear to be responsive to the RAIs and Holtec confirmed it does not credit the presence of the cassette under accident conditions.

Management concluded the meeting by saying that there is more work to do to provide clarity, cohesiveness, and consistency of the licensing design basis for this package and that the changes and modifications to be made to the package design may warrant the need for a "clean" application, where analyses and references support the regulatory findings the staff has to make.

Management said that, in the case of a withdrawal followed by a new submittal, the same review team will be kept to maintain some level of continuity. Staff made no regulatory commitment during the meeting.

Docket No. 71-9375
EPID L-2017-LLA-0059

Enclosures:

1. Meeting Attendees
2. Presentation

SUBJECT: SUMMARY OF AUGUST 24, 2018, MEETING WITH HOLTEC INTERNATIONAL,
DOCUMENT DATE: September 7, 2018

DISTRIBUTION: SFST r/f, MLayton,

RPowell, RI

BBonser, RII

JKatanic, RIII

JWhitten, RIV

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2nd round RAIs presentation 08-23-18 final.pdf

ADAMS No.: ML18256A100 Memo & Encl. 1: ML18256A102 ML18256A101

OFC	SFM	E	SFM	C	SFM			
NAME	PSaverot		WWheatley		JMcKirgan			
DATE	08/30/2018		08/30/2018		09/07/18			

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**Meeting Between HOLTEC and the
Nuclear Regulatory Commission
August 24, 2018
Meeting Attendees**

NRC/NMSS/SFM

Pierre Saverot
Antonio Rigato
Gordon Bjorkmann
Joe Borowski
Veronica Wilson
David Tarantino
Jeremy Smith
John McKirgan
Yoira Diaz-Sanabria

HOLTEC

Stefan Anton
Chuck Bullard
Venkat Prabhala
Abrar Mohammad