

Request for Supplemental Information
Holtec International
Docket No. 71-9375
Model No. HI-STAR ATB 1T Package

By letter dated February 6, 2017, Holtec International (Holtec) submitted an application for Certificate of Compliance No. 9375, Revision No. 0, for the Model No. HI-STAR ATB 1T package.

This request for supplemental information (RSI) identifies information needed by the U.S. Nuclear Regulatory Commission staff (the staff) in connection with its acceptance review of the Model No. HI-STAR ATB 1T package application to confirm whether the applicant has submitted a complete application in compliance with regulatory requirements.

The requested information is listed by chapter number and title in the package application. NUREG-1609, "Standard Review Plan for Transportation Packages for Radioactive Material," was used for this review.

Chapter 2 – Structural Evaluation

- 2.1 Provide the following software input files reported missing by ANSYS and LSDYNA to support submitted calculations related to lifting, normal conditions of transport, and hypothetical accident conditions.
- (i) HI-STAR 1TB 1T STEP.STEP. ANSYS expects this file to be located at D:\Project\2404-Drop Test\step files\HI-STAR 1TB 1T STEP.STEP and is used for calculation 2 in support of the HI-2177540 calculation package.
 - (ii) 9786-1000.step. ANSYS expects this file to be located at D:\PROJECTS\2404-Full model\9786-1000.step and is used for calculation 3 in support of the HI-2177540 calculation package.
 - (iii) ATB-CASK.DYN, ATB-TANK.DYN, BAR-PV.DYN. These LS-DYNA files are reported to be missing when the run.dyn file for the 1m-CGOC puncture scenario is opened. These files support the HI-2177539 calculation package.
 - (iv) ATB-CASK.DYN, ATB-TANK.DYN, CONTACTS.DYN. These LS-DYNA files are reported to be missing when the run.dyn file for the 30 foot bottom end drop scenario is opened. These files support the HI-2177539 calculation package.
 - (v) CONTACTS.DYN. This LS-DYNA file is reported to be missing when the run.dyn file for the 30 foot oblique drop scenario is opened. This file supports the HI-2177539 calculation package.

This information is needed to determine compliance with 10 CFR 71.45 and 71.73(c)(1).

- 2.2 Provide the following documents used to support normal conditions of transport and hypothetical accident conditions:
- (i) Reference 2.6.7 of the SAR titled: SAND2017-0404 "Holtec HI-STAR ATB 1T Impact Test Program Report", Sandia National Laboratories, January 2017.
 - (ii) Reference 3.8 of report HI-2167517R1 titled: Holtec Dwg. 10429, Revision 2
 - (iii) Reference A.1 of report HI-2167517R1 titled: "Construction of True-Stress-True-Strain Curves for LS-DYNA Simulations," Holtec Position Paper DS-307, Revision 1.

This information is needed to determine compliance with 10 CFR 71.71 and 71.73

Chapter 5 – Shielding Evaluation

- 5.1 Provide a complete characterization of the proposed contents, including the scope of physical form(s), their material properties, and the radionuclides along with their maximum allowable quantities.

In accordance with 10 CFR 71.33(b), the description of the contents should be complete with respect to the chemical and physical form of the material, as well as its radioactive content (radionuclides and quantity). The Division of Spent Fuel Storage and Transportation's Interim Staff Guidance-20 (SFST-ISG-20), "Transportation Package Design Changes Authorized Under 10 CFR Part 71 Without Prior NRC Approval," states that the content description must be consistent with the assumptions made about the contents in the package evaluation (e.g., in the containment, shielding, and criticality evaluations). These features must be described in sufficient detail to provide a basis for evaluating the package.

The application only currently discusses typical form(s) and materials that the proposed contents include. This is not adequate to characterize the contents because it indicates contents of different materials properties are, or may also be, intended for transport in the package. In terms of radionuclides, the application only describes fissile nuclides, taken from the 10 CFR Part 71 definition of fissile material, and cobalt-60 and limits that apply to these nuclides.

However, the application indicates that other nuclides may also be present in the contents but neither identifies these nuclides nor provides limits for the allowable quantities of these nuclides. These indications include the use of a 10% increase in the package dose rates for cobalt-60-bearing contents. The supporting basis for this factor is not provided and cannot be evaluated without an understanding of the materials properties and radioactive characteristics (including the radionuclides, their allowable quantities, concentrations, and energy spectra) for all of the contents for which use of the package is intended. The contents characterization may also impact the evaluation of the amount of material considered releasable as well. Since the applicant is seeking a Type B package certification, the contents characterization should provide a sufficient description of the allowed contents, including the different radionuclides that may be present in the contents and their allowable quantities.

The package analyses, including shielding, should be modified as necessary to adequately address the scope of the contents for which use of the package is intended. For example, as described in NUREG-1609, Section 5.5.2, "Radiation Source," the contents used in the shielding analysis should be consistent with the contents specified in the "General Information" section of the application. This guidance section also states that shielding analyses for packages with multiple types of contents should identify and evaluate the contents that produce the highest dose rates at each location around the package.

This information is needed to determine compliance with 10 CFR 71.33(b), 71.47, and 71.51.

- 5.2 Provide technical design drawings for all proposed packaging components, including the Type E waste packaging.

Section 1.4 of NUREG-1609 states "The design must be shown on engineering drawings that can be referenced in the certificate of compliance." The application indicates that there are five waste package types, Types A through E. However, only drawings for Types A through D are provided. The applicant reasons that because the Type E packaging includes a secondary container and optional waste basket that are not important to safety that drawings for the Type E packaging are not needed.

This statement is not correct. Since the components associated with the Type E configuration are part of the packaging and intended to be used with the certified package, the application needs to include drawings for these components. The level of details in the drawings should be commensurate with how these components are relied on in the package analyses and operations.

For example, the drawing does not need to include component tolerances that can impact a component's shielding capability (e.g., thickness tolerances) for a component that is not credited in the shielding analyses to reduce package dose rates. However, as described in NUREG-1609, Section 1.5.1.1 and guidance in SFST-ISG-20 regarding engineering drawings (pages 2-3) the package drawings, which the CoC will incorporate by reference, still need to include these components in order for the components to be considered as part of the package and to ensure the package configuration with those components is authorized by the CoC.

This information is needed to determine compliance with 10 CFR 71.33(a).

Chapter 7 – Operating Procedures

- 7.1 Provide operations descriptions addressing the following scenarios:
- a. Loading the package when loading of the BFA tank occurs when the BFA tank is not already within the ATB 1T cask (outer packaging),
 - b. Loading of the BTCs for the possible loading sequences and configurations identified in the application.

Section 7.5.1.2, "Loading of Contents," of NUREG-1609, describes the minimum information that the package operations in the application should address in terms of package loading. Similar guidance is also given in NUREG/CR-4775, "Guide for Preparing Operating Procedures for Shipping Packages," Section 1.3, "Package Loading," which is in the chapter that addresses operating procedures in safety analysis reports. The BFA tanks and the BTCs are components of the package.

Thus, the package operations in the application should describe the essential elements of loading operations applicable to these components, consistent with guidance in SFST-ISG-20 regarding package operations descriptions. This includes appropriate operations descriptions that address the different configurations and sequences identified or considered in the application for package loading, such as those identified in this RSI question. Including these descriptions will ensure the package is operated and will perform consistent with the technical analyses in the application and in compliance with relevant regulatory requirements.

This information is needed to determine compliance with 10 CFR 71.35(a) and 71.87.