Holtec Response to Request for Additional Information (Part 2)

Docket No. 72-1032
Holtec International
HI-STORM FW
Multipurpose Canister Storage System
Certificate of Compliance No. 1032
Amendment No. 7

RAI 3-1

Provide descriptions of the evaluations of the Version unventilated high density (UVH) cask in chapter 3.I of the safety analysis report (SAR). These descriptions should include the methodologies and acceptance criteria used in the evaluations as well as the results and discussions of those results that supports the stated conclusions. Specifically include the following evaluations:

a) The evaluation of the MPC containment boundary in the Version UVH cask,

b) The evaluation of Version UVH cask under internal and external pressure loads mentioned in section 3.I.3.2 of the SAR,

c) The evaluation of Version UVH closure lid under lifting and snow load conditions mentioned in section 3.I.3.3 of the SAR,

d) The evaluations of Version UVH cask's stability in the event of flood, explosion, and earthquake mentioned in sections 3.I.3.4 through 3.I.3.6 of the SAR,

e) The evaluation of Version UVH cask in the event of tornado (wind and missile impacts) mentioned in section 3.I.3.7 of the SAR, and

f) The evaluation of Version UVH cask in the event of non-mechanistic tip-over mentioned in section 3.I.3.8 of the SAR.

In accordance with 10 CFR 72.230(a), the applicant for a CoC must submit a SAR describing the proposed cask design and how the cask should be used to store spent fuel safely. However, the description of the design of the Version UVH cask in the SAR, specifically for the structural evaluations listed above, merely refences other reports in lieu of describing the methodology, acceptance criteria, results, and discussion for the structural evaluations. For example, the description of the tornado missile penetration analysis in SAR section 3.I.3.7 is a single sentence, "The penetration analysis for Version UVH cask using the wind and missile characteristics defined in Tables 2.2.4 and 2.2.5 is presented in Appendix J of [3.4.15] demonstrating all results are acceptable." This statement does not describe the penetration analysis; it references other tables and reports. The staff requests descriptions of the structural evaluations of Version UVH cask be added to the HI-STORM FW SAR that include the methodologies used in the evaluations, the acceptance criteria considered for the evaluations, the results of the analyses, discussions of those results that support the conclusions, and the conclusions of the evaluations.

This information is needed to determine compliance with the regulatory requirements in 10 CFR 72.230(a) and 10 CFR 72.236(l).

Holtec RAI Response:

Holtec understands Staff's concerns regarding the presentation of analysis material in Chapter 3.I of the SAR. Therefore, additional discussion related to methodology, acceptance criteria and results is added for all evaluations in Section 3.I.3. However, in certain cases where the methodology and acceptance criteria are same as those presented in the main Chapter 3 for specific evaluations, references to those sections or

paragraphs in Chapter 3 are made.

For example, the MPC confinement boundary evaluation is performed using the same analysis model, methodology and acceptance criteria described in Section 3.4 of Chapter 3 as the MPC's are not different in the HI-STORM UVH system, and only the input pressure and temperatures are varied based on the pressure limits in Table 2.2.1 and the thermal analysis results of HI-STORM UVH system presented in Chapter 4.I, respectively. Therefore, references to Paragraphs 3.1.3.2 and 3.4.3.2, and Subparagraph 3.4.4.1.5 are made in Subsection 3.I.3.1 along with the presentation of results for the two new analyses under normal and off-normal conditions to respond to Staff's request. The analyses under design, handling, short-term normal and accident conditions are bounded by those presented in Section 3.4 of Chapter 3 for the MPC confinement boundary.

Similarly, references to the main chapter section/paragraph are made in the discussion of other evaluations, where applicable, to avoid repetition of information.

RAI 3-2

Provide full versions of the following reports: (1) Holtec proprietary report HI-2094418, "Structural Calculation Package for HI-STORM FW System," revision 37 and (2) Holtec proprietary report HI-2094392, "Tornado Missile Analysis for HI-STORM FW System," revision 13.

The applicant submitted change pages of the three documents requested to assist the staff in the review. However, some of the changes in this amendment rely on or reference information in sections of these documents that were not included in the change pages versions. For example, table 2.I.2.1 of the SAR states, "the lifting analysis of Version E cask using bounding lifted weight in Table 3.2.8 remains applicable for Version UVH cask." To verify this statement, the staff needs to review the lifting analysis of the Version E cask, which was not included in the change pages versions of HI-2094418.

This information is needed to determine compliance with the regulatory requirements in 10 CFR 72.236(l).

Holtec RAI Response:

Holtec understands Staff's concerns and therefore, the complete reports, HI-2094418R37 and HI-2094392R13, are provided with this RAI response.

RAI 3-3

Clarify the editorial changes with regard to handling and short-term operations made in sections 2.2.3 and 9.1 of the SAR. Specifically, address the followings:

a) Discuss the intent of the editorial changes, including which regulatory requirements, if any, these statements are addressing, and explain the view that the changes are merely editorial.

   In the Summary of Proposed Changes for this amendment, the applicant listed these changes in the last two bullets under editorial changes. However, it appears to the staff that the applicant may be defining new methods of evaluation for loadings, operations, and equipment. If these changes are intended to define new methods of evaluation, they would be considered technical changes, not editorial changes. NRC Regulatory Information Summary 2017-05, "Administration of 10 CFR Part 72 Certificate of Compliance Corrections and Revisions," and section 4.3 of NEI 12-04, "Guidelines for 10CFR 72.48 Implementation," provide guidance on editorial changes.

   The staff requests clarification on the intent of these editorial changes and the reasoning for listing them as "editorial."

b) Describe in the SAR the methods of evaluation and acceptance criteria for the analyses of the loadings, handling operations, and equipment used for the safety analysis mentioned in section 2.2.3 of the SAR and for the reports referenced in section 9.1.

The changes in sections 2.2.3 and 9.1 of the SAR state that the "method of analysis shall follow prior established precedent" and "a series of generic reports [9.1.4 thru 9.1.7] that address various loading scenarios have been adopted in Holtec's configuration control system." The staff requests the applicant supplement these statements to describe in the SAR the methodologies and acceptance criteria used in these analyses.

c) Clarify the statement in section 2.2.3 of the SAR, "To perform the site-specific safety analysis of the handling evolutions, the magnitude of the incident load should be informed by its frequency of likely occurrence and the mitigative measures employed."

It appears to the staff that this statement is introducing a new method of evaluation for analyzing handling operations that includes considerations of the likelihood of certain loads and potential mitigative measures. Clarify the followings: (1) what was the intent of this statement; (2) what loads does this statement apply to; (3) how are these likelihoods and mitigative measures determined; (4) how are the likelihood and mitigative measures considered in or affect these site-specific safety analyses; and (5) what regulatory requirement, if any, does this statement address.

d) Define the terms "short-term operations" and "transitional transitory steps" as they are used in the statement from section 2.2.3 of the SAR, "All short-term operations, except the transitional transitory steps (such as upending or down-ending of the cask, placement of the Closure Lid on HI-STORM), shall be subject to safety analysis under the postulated environmental loads."

e) Justify the exception of "transitional transitory steps" to the conditions that require safety analysis, as stated in section 2.2.3 of the SAR.

In accordance with 10 CFR 72.236(l), an applicant for a CoC shall evaluate the Important to Safety (ITS) Systems, Structures, and Components (SSCs) under normal, off-normal, and credible accident conditions, and the definition of ITS SSCs in 10 CFR 72.3 includes features that prevent damage to the spent fuel during handling. Given these regulatory requirements, it's not clear to the staff what "transitional transitory steps" are or why they do not require safety analysis.

f) Describe in the SAR the method of evaluation and acceptance criteria for the probabilistic risk assessment (PRA) discussed in the statement from section 2.2.3 of the SAR, "With respect to short-term operations in dry storage campaigns, a [PRA] may be employed at a geologically stable and low return frequency site, characterized by a small number of annual loadings, to evaluate the risk associated with a simultaneous earthquake event." Additionally, clarify: (1) how this PRA would be considered in or affect the safety evaluation of operations; (2) which operations would be affected; (3) how the PRA would be used to address regulatory requirements, if any; (4) which regulatory requirements would the PRA address; (5) the definitions of "geologically stable" and "low return frequency site;" and (6) the justification for those definitions."

It appears to the staff that the quoted sentence from SAR section 2.2.3 is attempting to establish a new method of evaluating operations using a risk assessment, however, the applicant has not provided any information on this analysis.

g) Describe in the SAR the methods of evaluation and acceptance criteria for the sliding analysis mentioned in the statement from section 2.2.3 of the SAR, "Safety against potential sliding of the assemblage leading to an impact with a safety significant structure proximate to the haul path shall also be ascertained."

h) Justify the statement in section 9.1 of the SAR that characterizes loading configurations and ancillary equipment as being outside of the scope of the final safety analysis report (FSAR). Additionally, clarify which loading configurations and ancillary equipment are being discussed in the editorial change in section 9.1 of the SAR and which regulatory requirements this editorial change is addressing, if any.

In section 9.1 of the SAR, the applicant stated, "The safety evaluation of the various loading

configurations and ancillaries is outside the scope of this FSAR because such equipment and analyses must, of necessity, be site specific to accord with the exigencies of the architecture of each plant." It's not clear to the staff which loading configurations and ancillary equipment the applicant is referring to. The staff notes that 10 CFR 72.236(l) requires an applicant for a CoC to evaluate the ITS SSCs under normal, off-normal, and credible accident conditions and the definition of ITS SSCs in 10 CFR 72.3 includes features that prevent damage to the spent fuel during handling. Given these regulatory requirements, it's not clear to the staff why the applicant considers the safety evaluation of certain loading configurations and equipment outside the scope of this FSAR. The staff recognizes the site-specific nature of handling operations at individual independent spent fuel storage installations, but it's not clear to the staff how the presence of site-specific characteristics preclude the applicant from meeting the regulatory requirements applicable to CoC holders in 10 CFR Part 72.

This information is needed to determine compliance with the regulatory requirements in 10 CFR 72.230(a) and 10 CFR 72.236(l).

Holtec RAI Response:

The changes in FSAR Sections 2.2.3 and 9.1 were intended to clarify the approach to various short-term operations, in light of some of the on-going industry discussions around this topic. However, since the submittal of this amendment, there have been further industry wide discussions with NRC staff, and issuance of an Enforcement Guidance Memorandum. Additionally, there has been submittal of a guidance document for potential NRC endorsement. Therefore, to avoid inconsistency between this FSAR and other industry activities, these proposed FSAR changes have been removed from this application.