RAI 3-6. Provide a dose rate analysis associated with the non-mechanistic tipover accident.

In Proposed Change #9, the applicant proposes to remove the dose evaluation from the accident analyses for the non-mechanistic tipover event. The applicant states that the basis for this removal is that the event is not credible.

The original RAI 3-6 requested that the applicant define "credible" and provide an assessment that this event meets that definition or provide the dose analysis. In its response to RAI 3-6, the applicant provided some information to justify that the event is not credible. The staff evaluated the response and found that it is not sufficient in that it only considered the risk of seismic events rather than a broader spectrum of possible initiating events.

The tipover event is a part of the design basis for this system as the non-mechanistic tipover event is identified as a design basis accident in the Final Safety Analysis Report Sections 2.2.3.2 and 11.2.3. The definition of Design Basis is provided in 10 CFR Part 72.3, which requires, in part, controlling parameters for "…the effects of a postulated event under which a structure, system, or component must meet its functional goals."

Thus, in order to support Amendment No. 15 for the HI-STORM 100, the staff is requesting that the applicant include the dose evaluation of the non-mechanistic tipover event. The regulations in 10 CFR 72.236(b) require, "design bases and design criteria must be provided for structures, systems, and components important to safety." Further, 10 CFR 72.236(d) requires that the applicant for a CoC demonstrate that the shielding is sufficient to meet the requirements of 10 CFR 72.106, which includes maximum dose limits from any design basis accident.
Based on the aforementioned statements, the staff requests that the applicant provide the dose evaluation associated with the non-mechanistic tipover event.

This information is needed to ensure compliance with 10 CFR 72.236(b) and (d).

Holtec Response:

The dose rate analysis associated with the non-mechanistic tip-over accident for HI-STORM 100S Version B is restored in Subsection 11.2.3 of the FSAR. For the HI-STORM 100S Version E overpack, a new analysis associated with the non-mechanistic tip-over accident is added in Subsection 11.II.2.3 of the FSAR. The results demonstrated that for the bounding source term, the dose at the controlled area boundary remains in compliance with the regulatory requirements of 10CFR72.106 for the accident duration up to 11 days. Corrective action after a tip-over would include a radiological and visual inspection to determine the extent of the damage to the overpack and the contained MPC. The dose rate measurements will be performed and the actual dose rate levels will be established. Based on the dose rates, special handling procedures, including the use of temporary shielding, will be developed and implemented to ensure ALARA during recovery operations.

RAI 4-3 Provide calculations and analysis results for the case that HI-STORM 100S Version E overpack is used in a sheltered configuration

Section 1.II.2.1 of the FSAR states, "Like all other versions, Version E can be deployed in an unsheltered or sheltered storage mode. However, if the sheltered configuration is used then site-specific evaluations should be performed to ensure that the temperature profile (time averaged, as applicable) of the ventilation air entering the cask complies with the normal storage temperature limit set forth in Supplement 2.II (Principal Design Criteria) herein." However, the applicant did not provide any thermal models, calculations, and analysis results that demonstrate the predicted temperatures would be below any applicable temperature limits for a sheltered configuration. The staff needs this information to make sure the HI-STORM 100S Version E overpack in a sheltered configuration will not results in temperatures exceeding the criteria specified in the FSAR.

This information is needed to determine compliance with 10 CFR 72.236(b) and (f).

Holtec Response

In order to address this comment, detailed description of the thermal models and analysis methodology are added in Section 4.II.4.7 of the HI-STORM 100 FSAR. A thermal evaluation of a representative sheltered configuration has been performed for both normal and a postulated "loss of building ventilation" scenario and are documented in Sections 4.II.4.7 and 4.II.7.2 respectively. The evaluations demonstrate that the computed temperatures and pressures under sheltered configuration are well within their respective normal and accident condition limits.

The calculations are also documented in Appendix R of the companion calculation package HI-2043317.