

SAFETY EVALUATION REPORT

Docket No. 72-1008
HI-STAR 100 CASK SYSTEM
Certificate of Compliance No. 1008
Amendment No. 2

SUMMARY

By application dated August 4, 2000, Holtec International, (Holtec) requested approval of an amendment, under the provisions of 10 CFR Part 72, Subpart K, to the Certificate of Compliance (CoC) for the HI-STAR 100 Cask System. For this amendment, Holtec requested changes to Appendix B of the CoC. Appendix B of the CoC specifies the approved contents and design features for the HI-STAR 100 Cask System. The changes to CoC Appendix B modify the specifications for the cask pad and foundation. The principal design criteria and the allowable cask contents are not being altered with this amendment. All other aspects of the cask design and operation, including the thermal, shielding, criticality, confinement, operating procedures, acceptance tests and maintenance, radiation protection, accident analysis, quality assurance and decommissioning are also unaffected. As a result, this Safety Evaluation Report (SER) only addresses the structural aspects of the cask design and operation.

The HI-STAR 100 Cask System was evaluated against the regulatory standards in 10 CFR Part 72. NRC staff reviewed the application using the guidance in NUREG-1536, "Standard Review Plan for Dry Cask Storage Systems." Based on the statements and representations in the application and the conditions discussed in this SER, the staff concluded that the HI-STAR 100 Cask System meets the requirements of 10 CFR Part 72. The changes to the CoC are indicated by change bars in the margin.

REFERENCES

Holtec International application dated August 4, 2000.

STRUCTURAL

The current CoC requires that all independent spent fuel storage installation (ISFSI) pads be designed to meet a specific set of detailed parameters, including pad thickness, concrete compressive strength, reinforcing bar yield strength, and subgrade modulus of elasticity. Holtec requested that these parameters, which are specified in Section 1.4.6 of Appendix B in the CoC, be removed from the CoC and be replaced by a single requirement. The single requirement is that all ISFSI pads be designed such that all design basis postulated accident cask drop and non-mechanistic tipover events on the pad result in a HI-STAR 100 cask deceleration of less than or equal to 60-g at the top of the fuel basket.

The staff concurs that the 60-g deceleration limit is an appropriate safety limit to be included in the CoC. The 60-g limit is the current HI-STAR 100 Cask System's design basis g-load. As a result, there is reasonable assurance that no structural failure of the cask system will occur after a postulated accident drop or a non-mechanistic tipover event. Removing the detailed pad parameters from the CoC and leaving the specific ISFSI pad design parameters to the discretion of the cask users allows more flexibility for the cask users to design their ISFSI pads according to their site-specific needs and geological characteristics, while continuing to meet the design basis cask deceleration limit.

In the existing Safety Analysis Report (SAR), the HI-STAR 100 Cask System has been evaluated using the ISFSI pad design parameters presented in Table 2.2.9. With this amendment, Holtec has evaluated the HI-STAR Cask System using an additional set of ISFSI parameters. The second set of ISFSI pad design parameters is also presented in Table 2.2.9 of the proposed SAR changes in the amendment request. Finite element analyses have been performed using the second set of pad design parameters to confirm that the cask drop and tipover events will result in cask decelerations less than or equal to the design basis 60-g limit. Based on these analyses results, additional site-specific cask impact analyses are not needed when the ISFSI pads and subgrade are in compliance with either of the two sets of ISFSI design parameters provided in Table 2.2.9 of the proposed SAR. Although a site-specific impact analysis is not needed if the parameters from SAR Table 2.2.9 are chosen, 10 CFR 72.212(b)(2)(ii) continues to require a structural analysis of the ISFSI pad be performed to ensure that the ISFSI pads are adequately designed for the HI-STAR 100 Cask System and the foundations of ISFSI sites. The ISFSI pad structural analysis should be included in 10 CFR 72.212 evaluations performed by the ISFSI cask user.

In conclusion, the amendment does not change the structural design aspects of the HI-STAR 100 Cask System nor will it affect the ability of the package to meet the requirements of 10 CFR Part 72.

CONDITIONS FOR CASK USE - TECHNICAL SPECIFICATIONS

Certificate of Compliance No. 1008, Appendix B, "APPROVED CONTENTS AND DESIGN FEATURES FOR THE HI-STAR 100 CASK SYSTEM," is being modified with this amendment. Specifically, item 6 in Section 1.4, "Site Specific Parameters and Analyses," is being modified to eliminate the specific requirements associated with concrete thickness, concrete compressive strength, concrete reinforcement, and the effective modulus of elasticity for the soil. The revised CoC replaces the specific parameters with a requirement that the analyzed cask deceleration be limited to 60-g for the design basis cask drop and non-mechanistic tipover event. The revised specification requires the analysis be performed using the methodologies described in the FSAR.

CONCLUSION

The staff reviewed the amendment request and the proposed SAR changes for the HI-STAR 100 Cask System. Based on the statements in the application and representations contained in the proposed SAR changes and the conditions in the CoC, the staff concludes that the HI-STAR 100 Cask System meets the requirements of 10 CFR Part 72.

Issued with Certificate of Compliance No. 1008,
Amendment No. 2, on May 25, 2001.