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Mr. John Goshen  
c/o Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

August 20, 2010

**Subject:** Submittal of Responses to Second Request for Additional Information for the Holtec International HI-STORM Flood/Wind Multipurpose Canister Storage System General License Application, USNRC Docket No. 72-1032 (TAC L24321)

**References:**

- [1] Holtec Letter 5018004, dated September 18, 2009
- [2] Holtec Letter 5018007, dated December 18, 2009
- [3] Holtec Letter 5018008, dated April 13, 2010
- [4] Holtec Letter 5018009, dated June 4, 2010
- [5] NRC Letter (Goshen) to Holtec (Morin), dated August 11, 2010
- [6] NRC Letter (Goshen) to Holtec (Morin), dated January 21, 2010

Dear Mr. Goshen:

By letter dated September 18, 2009 [1], Holtec submitted a license application (LA) request for certification of the HI-STORM FW MPC Storage System Under 10CFR72, Subpart L. This LA submittal was supplemented on December 18, 2009 [2], April 13, 2010 [3], and June 4, 2010 [4].

Staff sent a second request for additional information (RAI) on the LA on August 11, 2010 [5]. We are pleased to herein submit the QA validated responses to the second request for RAI on the HI-STORM FW system within the agreed upon time of one week. One RAI question each on criticality safety and structural qualification required additional analyses which have been performed and incorporated in the SAR along with the text clarifications needed to satisfy the remaining RAI questions. There has been no adverse change in the margins of safety previously reported as a result of the supplemental analyses performed to complete the response to this RAI.

The criticality and tornado missile calculation packages have been accordingly supplemented and archived in our configuration control system. Since the extent of the required changes to the SAR is minor, we believe that a stand alone presentation of the changes will facilitate an expedited Staff review. Accordingly, we have compiled all affected SAR pages in Attachment 1, these are presented as proposed changes and will be finalized with the rest of the SAR within 90 days of the issuance of the Certificate of Compliance, in accordance with 10 CFR 72.248(a)(1).



Attachment 1 to this letter contains the individual responses to the RAI questions. Attachment 2 contains the updated SAR pages; changes are marked as follows: new text in *italics*, deleted text in ~~strikethrough~~, and revision bars in the right hand margin.

Attachments 3 and 4 are the revised calculation packages for criticality and the tornado missile analysis, respectively. Holtec considers the SAR and the calculation packages to be proprietary information, therefore Attachment 5 to this letter is an affidavit prepared in accordance with 10 CFR 2.390 requesting that they be withheld from public disclosure.

We thank SFST for convening the clarifying phone call on August 11, 2010 which enabled us to meet the specified deadline for the response. We would expect that this slight deviation from the original review plan [6] will not have a significant effect on the overall schedule for the approval of the HI-STORM FW System.

Please do not hesitate to contact me if you require any additional information or clarification at 1-856-797-0900 x687 or t.morin@holtec.com.

Sincerely,

Ms. Tammy S. Morin  
Licensing Manager  
Holtec Technical Services, Holtec International

cc (letter only):

Mr. Eric Benner, USNRC  
Mr. Douglas Weaver, USNRC  
Ms. Vonna Ordaz, USNRC  
Holtec Group 1

List of Attachments:

- Attachment 1: Responses to Request for Additional Information
- Attachment 2: Holtec Report HI- 2084239, "Safety Analysis Report on the HI-STORM FW System," Proposed Revision 2, changed pages only (Proprietary)
- Attachment 3: Holtec Report HI-2094432, "Criticality Evaluation of the HI-STORM FW System," Revision 2 (Proprietary)
- Attachment 4: Holtec Report HI-2094392, "Tornado Missile Analysis for the HI-STORM FW System," Revision 2 (Proprietary)
- Attachment 5: Affidavit Pursuant to 10CFR2.390 to Withhold Information from Public Disclosure

Attachment 1 to Holtec 5018010 –  
Response to Second Request for Additional Information on the  
HI-STORM FW MPC Storage System

**3.0 STRUCTURAL EVALUATION**

- 3-1. Evaluate the sliding resistance under large tornado missile impact for the HI-STORM FW and the HI-TRAC Variable Weight (VW) transfer cask.

Holtec Report No: 2094392, "Tornado Missile Analysis for HI-STORM FW System" states (page 13):

"The missile impacts plus steady tornado wind do not cause the HI-STORM FW or HI-TRAC VW overturning or excessive sliding."

However, there is no analysis of the sliding potential. Furthermore, the assumption utilized for the tipover analysis (page A.3, "The coefficient of friction between the cask and the foundation is assumed to be infinite. In other words, there is no conversion of the missile kinetic energy into translation motion of the cask"), by definition precludes sliding.

This information is required to determine compliance with 10 CFR 72.236(l).

Holtec Response: A calculation has been performed to assess sliding of the HI-STORM FW and the HI-TRAC VW after an impact from the design basis large tornado missile and tornado wind. This has been added to Holtec Report HI-2094392 in Appendices A and C. Subsection 3.4.4.1.3 of the HI-STORM FW FSAR has also been updated to include a description of the sliding calculation, and Table 3.4.16 has been added to summarize the results.

**6.0 CRITICALITY EVALUATION**

- 6-1 Justify that the 10x10G fuel assembly class is conservatively modeled with respect to partial length rods (PLRs).

When determining modeling assumptions for fuel assemblies that contain part-length rods (PLRs), it was found for most all assembly classes with PLRs that it was more conservative to remove the PLRs completely. This changes the water-to-fuel ratio but is consistent with the conclusion that these assemblies are undermoderated. However, for the 10x10G assembly, it was found that removing the PLRs reduce reactivity and therefore this assembly is modeled with all rods full length. Although the staff understands that adding fuel can be more conservative, it also changes the water-to-fuel ratio making the assembly more undermoderated. Therefore there may be an intermediate length of the PLRs that is more reactive than 0 or full length. Was this assembly type evaluated for the actual length of the partial length rods? Justify that the most conservative length of the PLRs was used to model this assembly. Justify that this assembly is undermoderated or justify that all of the modeling assumptions (dimensions, flooding, etc.) that are based on the conclusion that the assemblies are undermoderated is applicable for this assembly. (Reference HI-STORM FW Safety Analysis Report (SAR) Section 6.2.1 pages 6-15 and 6-15)

The staff needs this information to determine that k-eff has been calculated with the maximum reactivity and to ensure that the applicant has met the requirements in 10 CFR

72.124(a) and 72.236(c).

Holtec Response: The discussion in Section 6.2.1 regarding the partial length rods has been expanded, and a new Table 6.2.7 has been added, to address more fully the specific condition of the partial length rods in the 10x10G assembly class. The newly presented results show that the condition where all partial length rods are replaced by full length rods remains bounding, and that no optimum condition exists with any partial length rod length.

- 6-2 Provide an explanation why the reactivity (k-eff value) of the 15x15I assembly increased in the revision of the SAR submitted in response to staff RAIs on June 4, 2010. Although the increase is not substantial and does not cause any safety limits to be exceeded, it does not appear that the increase is due to any questions asked by the staff.

The staff needs this information to determine that k-eff has been calculated with the maximum reactivity and to ensure that the applicant has met the requirements in 10 CFR 72.124(a) and 72.236(c).

Holtec Response: The increase in the reactivity (k-eff value) of the 15x15I assembly in the revision of the SAR submitted in response to staff RAIs on June 4, 2010 was a result of the response to RAI question 6-13 from the first request for additional information. In the RAI Staff had requested Holtec to "Justify that the assumed location of guide tubes and water rods is conservative" and "Provide additional information demonstrating that the locations of guide tubes and water rods assumed in the criticality models are conservative as compared to the actual lattice geometry." Holtec had then analyzed the 15x15I assembly (see Section 6.B.4) with and without guide rods and the comparison was presented in Table 6.2.5. Holtec then chose to report the higher reactivity, i.e. the case without the guide rods, as the design basis case for this assembly type in Table 6.1.1, therefore there are no specific restrictions on the location and number of guide rods. Unfortunately our original response to the RAI was not complete in identifying the resulting changes reported in Table 6.1.1 for the 15x15I assembly.

- 6-3 With respect to the damaged fuel evaluations, correct the statement "The active length of these rods is chosen to be the maximum active fuel length of all fuel assemblies listed in Section 6.2." on page 6-49 of the HI-STORM FW SAR.

The paragraph above the section titled "Bare Fuel Rod Arrays" on page 6-49 states that the calculation was performed for an active fuel length of 150 inches, and that there are two assembly classes with an active length greater than this. Therefore, the staff finds that the statement on the third bullet under the heading "Bare Fuel Rod Arrays" that states "The active length of these rods is chosen to be the maximum active fuel length of all fuel assemblies listed in Section 6.2." is incorrect.

10 CFR 72.11 requires that the information provided by the applicant be complete and accurate in all material respects.

Holtec Response: The 3rd bullet under the section titled "Bare Fuel Rod Arrays" on page 6-49 has been revised to be consistent with the discussion above it under the section titled "Bounding Undamaged Assemblies" (also on Page 6-49), and to clearly indicate the conservatism associated with the choice of the active length of the damaged fuel.

- 6-4 Provide the conditions for the calculations performed on temperature effects using CASMO-4.

The staff requested in first round RAI 6-29 that the applicant provide the conditions for the calculations presented in Table 6.3.1 of the HI-STORM FW SAR. In response to this RAI, the applicant stated that "the conditions used in those analyses have been clarified in the SAR" however the staff is still unable to locate this information. Provide further clarifying information as to the location of this information.

The staff needs this information to determine that k-eff has been calculated with the maximum reactivity and to ensure that the applicant has met the requirements in 10 CFR 72.124(a) and 72.236(c).

Holtec Response: The discussion in Section 6.3.1 on the CASMO-4 calculations, including the information provided in Table 6.3.1, has been updated to clearly identify and justify the conditions of those calculations.

**AFFIDAVIT PURSUANT TO 10 CFR 2.390**

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I, Tammy S. Morin, being duly sworn, depose and state as follows:

- (1) I have reviewed the information described in paragraph (2) which is sought to be withheld, and am authorized to apply for its withholding.
- (2) The information sought to be withheld is provided in Attachments 2 through 4 to Holtec letter Document ID 5018010, which contain Holtec Proprietary information.
- (3) In making this application for withholding of proprietary information of which it is the owner, Holtec International relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4) and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10CFR Part 9.17(a)(4), 2.390(a)(4), and 2.390(b)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

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- (4) Some examples of categories of information which fit into the definition of proprietary information are:
- a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by Holtec's competitors without license from Holtec International constitutes a competitive economic advantage over other companies;
  - b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product.
  - c. Information which reveals cost or price information, production, capacities, budget levels, or commercial strategies of Holtec International, its customers, or its suppliers;
  - d. Information which reveals aspects of past, present, or future Holtec International customer-funded development plans and programs of potential commercial value to Holtec International;
  - e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs 4.a and 4.b above.

- (5) The information sought to be withheld is being submitted to the NRC in confidence. The information (including that compiled from many sources) is of a sort customarily held in confidence by Holtec International, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by Holtec International. No public disclosure has been made, and it is not available in public sources. All

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disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within Holtec International is limited on a "need to know" basis.
- (7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his designee), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside Holtec International are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.
- (8) The information classified as proprietary was developed and compiled by Holtec International at a significant cost to Holtec International. This information is classified as proprietary because it contains detailed descriptions of analytical approaches and methodologies not available elsewhere. This information would provide other parties, including competitors, with information from Holtec International's technical database and the results of evaluations performed by Holtec International. A substantial effort has been expended by Holtec International to develop this information. Release of this information would improve a competitor's position because it would enable Holtec's competitor to copy our technology and offer it for sale in competition with our company, causing us financial injury.

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- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to Holtec International's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of Holtec International's comprehensive spent fuel storage technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology, and includes development of the expertise to determine and apply the appropriate evaluation process.

The research, development, engineering, and analytical costs comprise a substantial investment of time and money by Holtec International.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

Holtec International's competitive advantage will be lost if its competitors are able to use the results of the Holtec International experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to Holtec International would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive Holtec International of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Document ID 5018010  
Non-Proprietary Attachment 5

**AFFIDAVIT PURSUANT TO 10 CFR 2.390**

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STATE OF NEW JERSEY     )  
  )     ss:  
COUNTY OF BURLINGTON )

Ms. Tammy S. Morin, being duly sworn, deposes and says:

That she has read the foregoing affidavit and the matters stated therein are true and correct to the best of her knowledge, information, and belief.

Executed at Marlton, New Jersey, this 20<sup>th</sup> day of August, 2010.



Tammy S. Morin  
Holtec International

Subscribed and sworn before me this 20<sup>th</sup> day of August, 2010.



**MARIA C. MASSI**  
**NOTARY PUBLIC OF NEW JERSEY**  
My Commission Expires April 25, 2015