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October 18, 2021

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Docket No. 99902086 - HDI Spent Fuel Pool Heatup Calculation Methodology

Subject: Response to Request for Additional Information 10 - Holtec Spent Fuel Pool Heat Up Calculation Methodology Topical Report

References:

1. Letter from Holtec International to US NRC, "Holtec Spent Fuel Pool Heat Up Calculation Methodology Topical Report," September 29, 2020 (ML20280A524)
2. US NRC Electronic Mail Request to Andrea Sterdis (HDI) "Formal Transmittal of the US NRC Request for Additional Information 10 for Holtec Topical Report HI-2200750 Revision 0, "Holtec Spent Fuel Pool Heat Up Calculation Methodology," October 14, 2021

Dear Sir or Madam:

In Reference 1, Holtec Decommissioning International, LLC (HDI) submitted a Topical Report providing a methodology for calculating Spent Fuel Pool heat up for NRC review and approval. Holtec believes the methodology will be a large benefit in reducing zirconium fire risks in the spent fuel pool.

In Reference 2, the NRC transmitted a request for additional information (RAI) concerning the Topical Report. The following Enclosures to this letter provide a response to the NRC RAI.

This letter provides the Holtec response to the NRC RAI 10 provided in Reference 2.

Enclosure 1 provides a proprietary version of the Holtec response to RAI 10. This enclosure contains information proprietary to Holtec and is therefore supported by an affidavit signed by Holtec which is provided in Enclosure 3. The RAI and RAI response provided in Enclosure 1 provide markings identifying those portions that are proprietary.



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Enclosure 2 provides a non-proprietary, redacted version of the Topical Report including Supplement 2.

If you have any questions, please contact me at 856-797-0900 ext. 3813.

Sincerely,

Andrea L. Sterdis
VP, Regulatory and Environmental Affairs
Holtec Decommissioning International

Enclosures:

- Enclosure 1 Holtec Topical Report HI-2200750, Revision 2, "Holtec Spent Fuel Pool Heat Up Calculation Methodology." (Holtec Proprietary Withhold Information from Public Disclosure pursuant to 10 CFR 2.390)
- Enclosure 2 Holtec Topical Report HI-2200750, Revision 2, "Holtec Spent Fuel Pool Heat Up Calculation Methodology." (Non-Proprietary)
- Enclosure 3 Affidavit Pursuant to 10 CFR 2.390 to Withhold Information from Public Disclosure

cc:

Robert Lucas, NRC, NRR/DORL/LLPB
Dennis Morey, NRC, NRR/DORL/LLPB
Ekaterina Lenning, NRC, NRR/DORL/LLPB
Christopher Regan, NRC, NMSS/DFM

~~HOLTEC PROPRIETARY INFORMATION~~

Enclosure 1

Holtec Response to Request for Additional Information concerning Spent Fuel Pool Heat Up

Calculation Methodology Topical Report

Proprietary Version

Withhold Information From Public Disclosure Under 10 CFR 2.390

(3 Pages not including this Cover Page)

SUBMITTED SEPARATELY

Enclosure 2

Holtec Response to Request for Additional Information concerning Spent Fuel Pool Heat Up

Calculation Methodology Topical Report

Non- Proprietary Version

(3 Pages not including this Cover Page)

RAI-10

[

] 4.a, 4.b

Holtec Response

Introduction

The Topical Report uses [] 4.a, 4.b to determine heat load limits, [

] 4.a, 4.b the analysis for a single rack cell surrounded by adiabatic boundaries in all direction. It is [] 4.a, 4.b to the adiabatic methodology discussed in References [1] and [3] in the Topical Report, which has been reviewed and approved by USNRC for several plants¹. Based on this, [

] 4.a, 4.b

Comparison of Methods

The calculation and method used for Kewaunee is documented in Calculation 2013-07050, Rev 2, which is included in ML13351A040, beginning on page 37 of the document.

The principal characteristics of the methodologies are summarized in the table below.

Characteristic of the Methodology	Topical Report	Calculation 2013-07050 R2
No cooling by air considered	[] 4.a, 4.b	Section 1.1

¹ Examples: Kewaunee (ML14261A223); Fort Calhoun (ML16356A578); Pilgrim (ML19142A043)

Temperature limit of 900 °C	[] ^{4.a, 4.b}	Section 1.2, Section 4.1
10 Hour time limit	[] ^{4.a, 4.b}	Section 1.2
Reference to NUREG-1738 and SECY-99-168	[] ^{4.a, 4.b}	Section 1.2
Only zirconium and uranium considered, and only along the heated length	[] ^{4.a, 4.b}	Section 4.2,4.3 and 4.4
Starting temperature	[] ^{4.a, 4.b}	Section 5.4 – 32 °C
Heat-up time starts when pool is drained	[] ^{4.a, 4.b}	Section 5.5

The information in the table above supports the conclusion that []^{4.a, 4.b}

USNRC SER and Approval

The USNRC SER (ML14261A223) discusses the calculations and methodology in various places. The most relevant place is Page 19 which states the following (emphasis added):

The NRC staff found the adiabatic heat-up calculation adequate to demonstrate that a time exceeding 10 hours would be available before a significant radiological release might occur following an accident leading to loss of SFP water with no air cooling. The adiabatic heat-up calculation is a simplified method for determining the minimum time available for deployment of mitigation equipment and, if necessary, implementation of protective actions by offsite authorities using a CEMP approach. **The methodology used was suitably conservative to compensate for simplifications related to phenomena such as axial variation in heat generation** and the potential acceleration of the temperature increase as exothermic zirconium oxidation begins at high temperatures. The conservatisms include discounting the time for the water to drain from the SFP and neglect of additional heat sinks and heat transfer mechanisms that would exist in scenarios involving loss of SFP water inventory, even in situations where cooling air flow would be blocked.

This discussion confirms the adequacy of the methodology, and specifically addresses using the heat load without any further adjustments such as axial decay heat variations.

Summary

The methodology in the Topical Report to determine []^{4.a, 4.b} to that discussed in References [1] and [3] to the topical report (i.e., adiabatic approach), and has been reviewed and approved by USNRC for several plants, including Kewaunee

] 4.a, 4.b

Enclosure 3

October 18, 2021 Letter, Holtec International to US

NRC Affidavit for Withholding

(5 Pages Attached)

AFFIDAVIT PURSUANT TO 10 CFR 2.390

I, Andrea L. Sterdis, being duly sworn, depose and state as follows:

- 1) I have reviewed the information provided in the RAI responses provided in Enclosure 1 which is sought to be withheld, and am authorized to apply for its withholding.
- 2) The information sought to be withheld is in Enclosure 1 to the October 18, 2021 letter to NRC providing “Response to Request for Additional Information (RAI) 10 - Holtec Spent Fuel Pool Heat Up Calculation Methodology Topical Report.” The Enclosure 1 response contains information that is proprietary to Holtec International.
- 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 10 CFR 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 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

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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.
- 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

AFFIDAVIT PURSUANT TO 10 CFR 2.390

Holtec International's comprehensive decommissioning and 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 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.

