HOLTEC INTERNATIONAL

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August 28, 2013

John Goshen, P.E., Project Manager – Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety and Safeguards

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

Docket No. 72-1040
Certificate of Compliance (CoC) No. 1040

Subject: Responses to Second Request for Additional Information (RAI) for HI-STORM UMAX Canister Storage System (TAC No. L24664)

References: [1] Letter from J. Goshen (NRC) to Stefan Anton (Holtec), dated July 5, 2013

[2] Email from J. Goshen (NRC) to Holtec, dated August 22, 2013

Dear Mr. Goshen:

The referenced NRC letter [1] documents the NRC staffs' determination that additional information (RAI) is required to complete their safety evaluation of the HI-STORM UMAX Canister Storage System.

Attachment 1 to this letter contains the RAI responses. Response to RAI 6-1 is not included in Attachment 1 since RAI 6-1 was withdrawn by the NRC [2]. Holtec will submit the marked up HI-STORM UMAX FSAR and CoC pages after NRC accepts the RAI responses. Attachment 2 to this letter contains the Thermal input and output files of the thermal calculation package. Attachment 3 to this letter contains an affidavit prepared in accordance with 10 CFR 2.390 requesting that Attachment 2 be withheld from public disclosure.

If you have any questions, then please contact me at (856)-797-0900 ext. 3703.

Sincerely,

Veena Gubbi

Veena Gubbi
Project Manager of Licensing for HI-STORM systems
Holtec International

KIMSS26

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cc: (letter only w/o Attachments)
Michele Sampson, USNRC
Holtec Marlton (via email)
HUG Licensing Subcommittee (via email)

List of Attachments:

Attachment 1: Responses to Second Request for Additional Information (RAI)
Attachment 2: Input and Output files of the Thermal-Hydraulic Evaluation of HI-STORM UMAX, HI-2114807R3 (Hard drive) (Holtec Proprietary Information)
Attachment 3: Affidavit Pursuant to 10 CFR 2.390 to Withhold Information from Public Disclosure

Chapter 2 Principal Design Criteria

2-1 Clarify if the assumed axial variation in the heat generation rate of the design basis fuel assembly bounds other axial distributions in terms of the maximum predicted peak cladding temperature during vacuum drying.

Response 2-1 of first request for additional information (RAI-1) states that the physics of the heat transfer process in a thermosiphon enabled MPC suggests that the flattened power profile would produce a limiting or near limiting peak cladding temperature out of the infinite number of center- biased distributions that may obtain in practice. However, during vacuum drying the peak cladding temperature will be located at or towards the center of the active fuel length, depending on the assumed power profile which may result in higher temperatures.

This information is needed to assure compliance with 10 CFR 72.236(f)

<u>**Holtec Response**</u>:

It is correct that, when the steady state condition is reached during vacuum drying, the peak cladding temperature, T, will be located at or near the center of the active fuel length under a "center biased" power profile. As described in the response to 2-1 of RAI-1, a center biased power distribution with a linear heat generation rate q in the center equal 120% of the equivalent uniform value provides a bounding condition for this purpose (based on the information in the axial burnup profile database [1]). A thermal evaluation under an assumed full vacuum condition has been performed for the high burnup fuel in MPC-37 using the above bounding center biased power distribution. To ensure robust margins to the limit (400°C for High Burnup fuel) and in light of the Staff's concern to bound the worst case center biased heat generation profile, the *threshold* heat load, allowed for vacuum drying, has been modified (slightly reduced) as shown in Table 2-1.1 below. The analysis performed for this condition, using the 3-D Fluent model, yields the peak cladding temperature equal to 383°C (721°F), providing a sufficiently comfortable cushion against the 400°C (752°F) limit to accommodate any minor changes in the future that, as we know from past experience, are unavoidable in a long term product life cycle.

The above results including the reduced threshold heat load for vacuum drying will be incorporated in the Conformed FSAR, Section 4.5 to be issued after SFST's issuance of the SER.

Table 2-1.1 THRESHOLD HEAT LOAD UNDER VACUUM DRYING OF HIGH BURNUP FUEL FOR MPC-37		
Storage Cell Number Note 1	**Current Heat Load Pattern MPC-37 (kW)**	**Proposed Heat Load Pattern MPC-37 (kW)**
11-13, 18-20, 25-27	0.8	0.7
5-7, 10, 14, 17, 21, 24, 28, 31-33	0.97	0.97
Remaining Locations	0.97	0.97
Total MPC Heat Load	***34.36***	***33.46***
Note 1: See Figure 2.1.7 of the UMAX FSAR for storage cell locations.		

[1] R. J. Cacciapouti and S. Van Volkinburg, “Axial Burnup Profile Database for Pressurized Water Reactors”, Yankee Atomic Electric Company Report YAEC-1937, 1997.

2-2 Justify by analysis that the direction of wind does not affect the aerodynamics and thermal performance of the HI-STORM UMAX system.

The safety analysis report (SAR) pages 1-15 states that the air passages in the closure lid are configured in such a manner that the aerodynamics in the system is not affected by the change in the horizontal direction of the wind. However, no analysis is provided to justify this statement. Additional analysis with varying wind direction should be provided.

This information is needed to evaluate compliance with 10 CFR 72.236(f)

Holtec Response:

We regret the imprecise statement on page 1-15 of the FSAR. The statement will be modified to recognize that the arrangement of inlet and outlet ducts in "UMAX" minimizes (but does not eliminate) the effect of wind direction on the peak cladding temperature (PCT). Absolute insensitivity to the wind direction is not feasible in any ventilated rectilinear cask array.

In order to evaluate effect of the directionality of the wind, as requested by this RAI and clarified in a public teleconference, an additional evaluation has been performed for the (previously identified) limiting wind speed of 7 mph that is constant and blowing in a fixed oblique direction as shown in Figure 2-2.1. Because of the loss of symmetry introduced by the oblique angle of the wind vector, the current half-symmetric model had to be expanded to a 360° model. This evaluation is performed for the MPC type that produced the highest PCT under normal (quiescent) condition of storage i.e. MPC-37 with short fuel loaded to heat load chart 1. The table below provides the PCT for both the 45 degree (oblique) flow and the previously calculated parallel air flow (Table 4.6.2 of Attachment 3 to Letter 5021010) cases:

Item	*PCT (deg C)*
Parallel Flow	378
Oblique Flow	381

As can be seen from the above results, the effect of oblique direction is quite minor and the predicted PCT corrected for the uncertainties discussed in Sub-section 4.4.2 of the FSAR remains below the 400 deg. C temperature limit.

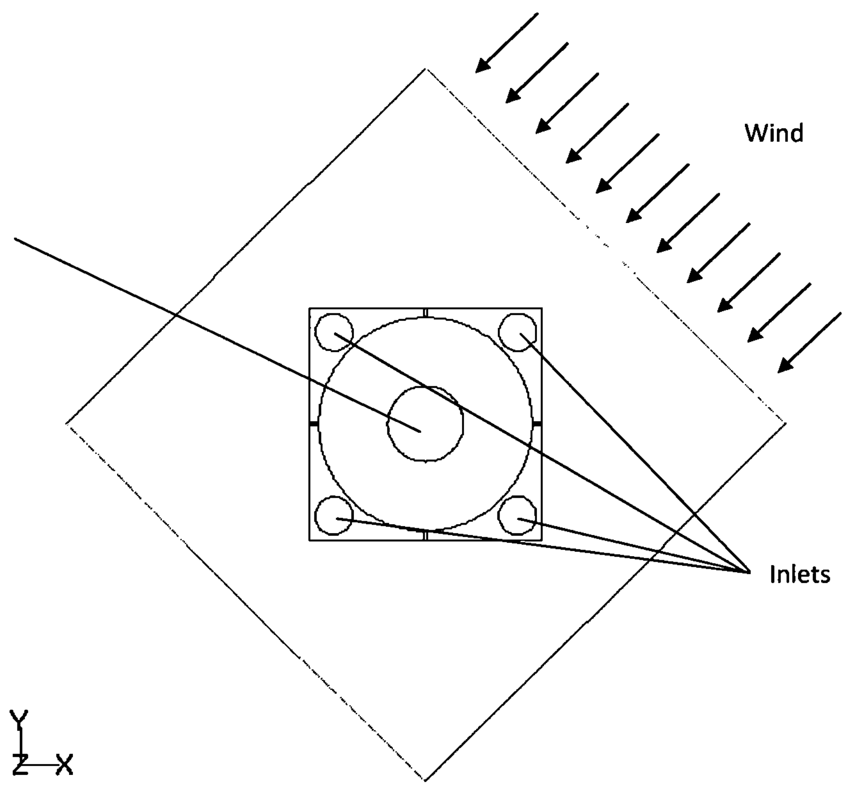

Figure 2-2.1 Schematic of the Analysis Condition - HI-STORM UMAX Full Model (Oblique Flow)

Chapter 4 Thermal Evaluation

4-1 Clarify why wind is not treated as a normal environmental variable to perform the thermal evaluation during normal storage.

Response 4-2 of RAI-1 states that to qualify the effect of wind as a contributor to the normal condition of storage, the wind vector must remain constant for one whole year. It also states that the issue is generic so that its resolution should be sought in a general forum since it affects many dry storage dockets. The staff disagrees with these statements. The system will undergo a quasi steady state in a matter of days, not an entire year and wind remains at constant average values for many days for the system to experience this condition. Also, wind only affects underground systems per a study conducted by the staff on several of the certified designs. During the review of the HI-STORM 100U design, the staff determined that since low speed wind has a direct impact in the calculated peak cladding temperature, staff's position was to treat wind as a normal environmental variable (along with ambient temperature, pressure, or insolation). Therefore, Holtec should add wind as an environmental variable which affects the thermal performance of the HI-STORM UMAX system for normal conditions of storage.

This information is needed to assure compliance with 10 CFR 72.236(f)

Holtec Response:

To comport with the direction provided by the Staff, sustained wind will be included in the FSAR as a site specific environmental parameter along with other previously recognized location sensitive parameters such as normal temperature and elevation above sea level (which affects the ambient air density). Parametric calculations have been performed with sustained wind velocity in the range of 0 (quiescent) to 20 mph for the design basis heat load and design basis normal ambient temperature. The case of heat load chart 1 (see Table 4.1.2 in the FSAR) for "short PWR" fuel was used for this parametric analysis because it gave the highest PCT for the normal condition of storage under the quiescent air scenario (no wind).

Table 4-3.1 (see response to 4-3 below) provides the computed PCT values for different wind velocities. It is observed from the results compiled below that the effect of wind is to elevate the PCT by a small amount. Even for the design basis case for the most limiting fuel type, however, the PCT remains below the 400 deg. C in all cases. However, to ensure the MPC cavity pressure remains below the pressure limit after including the effect of wind for all the scenarios, the helium backfill pressure range is modified. The proposed minimum backfill helium pressures for all the scenarios ensure that the operating pressure used in the thermal analyses is achieved. Therefore, all the existing temperature results remain unaffected. The proposed maximum helium backfill specifications ensure that the MPC cavity pressures at operating conditions remain below the pressure limit. Table 4.4.6

of the FSAR will be modified with Table 4-1.1 as shown below. Correspondingly, all the MPC cavity pressures in Chapter 4 will be re-calculated and modified in the FSAR.

TABLE 4-1.1
MPC HELIUM BACKFILL SPECIFICATIONS

	Item	**Specification[1] psig**
MPC-37, Charts 1 and 3 (Table 2.1.8)	Minimum Gauge Pressure	41.0
	Maximum Gauge Pressure	44.2
MPC-37, Chart 2 (Table 2.1.8)	Minimum Gauge Pressure	41.0
	Maximum Gauge Pressure	44.5
MPC-37 90% of Chart 1 (Table 4.4.3) Threshold Heat Load (Table 4.4.5)	Minimum Gauge Pressure	39.0
	Maximum Gauge Pressure	46.0
MPC-89 Design Heat Load (Table 2.1.9)	Minimum Gauge Pressure	42.0
	Maximum Gauge Pressure	45.2
MPC-89 90% of Design Heat Load Threshold Heat Load (Table 4.4.5)	Minimum Gauge Pressure	39.0
	Maximum Gauge Pressure	46.0

The MPC cavity pressure for the normal condition of various scenarios discussed in Chapter 4 are re-evaluated using the following:

1. Proposed new maximum helium backfill pressures tabulated above are used.
2. Effect of wind is included by adding the temperature difference of MPC cavity average temperature between wind condition and normal condition of storage without the effects of wind to all the scenarios.

The FSAR will be updated with the new results.

[1] Specification at a reference temperature of 21.1°C (70°F).

4-2 Clarify if in order to obtain the thermally limiting MPC, the wind analysis performed for the one by eight array model also considered the effect of other casks in the mass flow rate at the inlet and outlet vents.

SAR pages 4-36 states that to properly evaluate the effect of wind on pre-heating the inlet air of HI-STORM UMAX modules located inside an ISFSI array, a one by eight array model is constructed. However, the analysis only considered the effect of increasing the air inlet temperature. The effect of wind and other neighboring casks should also be obtained to determine if the mass flow rate is affected as compared to the casks exposed directly to wind. The applicant should compare the predicted mass flow rate of the different casks in the array with the case for quiescent conditions (for the range of wind speeds considered in the analyses) to obtain the limiting case. The effect of reduced mass flow rate and mixing effect should be used to obtain the maximum peak cladding temperature.

This information is needed to evaluate compliance with 10 CFR 72.236(f).

Holtec Response:

The wind has two potential thermal impacts on the CFD solution of the MPC in HI-STORM UMAX System

1. It may affect the ventilating air flow entering the UMAX system
2. It may increase the inlet air temperatures

A one by eight array CFD model with all the fuel, basket, MPC and CEC details can be as large as approximately 40 million cells. Because of the extremely large size of the CFD model, two separate models are constructed and evaluated to quantify the effect of the two above mentioned impacts:

A. For the HI-STORM UMAX VVM located in the front row of ISFSI array, a half-symmetric detailed model is constructed to analyze system subject to the direct aerodynamic effect of the wind on the inlet and outlet openings. A series of steady state computations are performed for different wind speeds and results are tabulated in Table 4-3.1.
B. To properly evaluate the effect of wind on pre-heating the air inlet temperature and mass flow rate of HI-STORM UMAX modules located inside an ISFSI array, a one by eight array model is constructed with MPC contents grossly modeled.

The objective is to determine the effect of wind on inlet air temperature and air mass flow rate through the inlets using the array model (B) and use them as an input to the detailed model discussed in (A) above.

The mass flow rates for each UMAX system (module) placed in a one by eight array at different wind speeds using model B above are reported in Table 4-2.1 below. In addition, the inlet air temperatures at various wind speeds for each module in a one by eight array are also summarized in Table 4-2.2 below (same as Table 4.6.3 of the FSAR). Based on these results, the detailed wind analysis is performed with the following conditions:

- The wind directly blows into Module #1 of the array model. Therefore, the first cask (module # 1) is used in the detailed single cask analysis since the mass flow rate is the lowest for the first module in an array of casks.
- A wind speed of 7 mph is analyzed since it results in bounding PCT and reasonably lower bounding mass flow rate.
- Though the inlet temperature is the highest for module #7 of the array model under a 5 mph wind speed, detailed single cask analysis is performed for Module #1 using the *worst case inlet temperature amongst all the modules.*

The thermal analysis due to the combined effects of inlet air temperature and mass flow rate are considered in the detailed analysis reported in Paragraph 4.6.1.3 of the FSAR which is confirmed to be reasonably bounding by the supplemental information summarized above.

Table 4-2.1

EFFECT OF WIND ON AIR MASS FLOW RATE THROUGH HI-STORM UMAX SYSTEM STORED IN AN ISFSI ARRAY

	Air Mass Flow Rate[1], kg/s				
	0 MPH	2 MPH	5 MPH	7 MPH	10 MPH
Module 1[2]	0.801	0.751	0.646	0.622	0.614
Module 2	0.801	0.780	0.790	0.762	0.732
Module 3	0.801	0.771	0.758	0.756	0.742
Module 4	0.801	0.764	0.752	0.744	0.746
Module 5	0.801	0.748	0.744	0.758	0.748
Module 6	0.801	0.698	0.746	0.742	0.734
Module 7	0.801	0.726	0.746	0.742	0.746
Module 8	0.801	0.734	0.704	0.750	0.736

1 Air inlet mass flow rate reported in this table is calculated in the cross-section surface of inlet pipe immediate below the inlet vent screen.
2 The series of module is numbered in the sequence as the wind direction, i.e. Module 1 is the front module facing the wind inlet.

Table 4-2.2

EFFECT OF WIND ON AIR INLET TEMPERATURES THROUGH HI-STORM UMAX SYSTEM STORED IN AN ISFSI ARRAY[3]

	Air Inlet Temperature Note 1, °F				
	0 MPH	2 MPH	5 MPH	7 MPH	10 MPH
Module 1	82	84	84	84	84
Module 2	82	83	85	86	86
Module 3	82	85	86	86	88
Module 4	82	90	86	89	90
Module 5	82	93	88	89	91
Module 6	82	91	89	89	92
Module 7	82	91	**93**	90	92
Module 8	82	90	90	87	89
Note 1: Air inlet temperature reported in this table is the mass-average temperature calculated in the cross-section surface of inlet pipe immediate below the inlet vent screen.					

[3] This table is duplicated from Table 4.6.3 in the HI-STORM UMAX FSAR.

4-3 Perform additional analysis to show that lower cladding temperatures are obtained for wind speeds in the range of 10 to 20 miles per hour (mph). Use smaller increments in the range of 7 to 10 mph to verify that the bounding case is obtained.

The wind evaluation provided in Holtec Report HI-2114807 only considered a range between 0 to 10 mph, Also the report shows a temperature difference of only one degree Celsius between 7 and 10 mph. These results show the bounding case may be in this range and may result in a higher cladding temperature.

This information is needed to evaluate compliance with 10 CFR 72.236(f).

Holtec Response:

As asked, additional steady state analyses are performed with wind speeds of 8, 9, 12, 15, 17 and 20 miles per hour (mph) to study the effect of wind on fuel cladding temperature. The runs for 8 and 9 mph wind speeds were made explicitly to explore whether a peak PCT condition lies between 7 and 10 mph cases. The results are presented in Table 4-3.1 below. The results show that the PCT remains essentially the same for wind speeds in the range of 7 to 10 mph. In other words, there is no cresting of the PCT in the suspected range (7 to 10 mph). Moreover, the PCT decreases as the wind speed increases beyond 10 mph. Therefore, the conclusion made in Section 4.6.1 that 7 MPH is the bounding wind speed has been further validated. These thermal evaluations for additional wind speeds will be documented in Section 4.4 of the HI-STORM UMAX FSAR.

Table 4-3.1

EFFECT OF WIND ON HI-STORM UMAX PEAK CLADDING TEMPERATURES - A SINGLE HI-STORM UMAX SYSTEM SIMULATED

Wind Speed (MPH)	Fuel Cladding Temperature °C (°F)
0	367 (693)
2	371 (700)
5	377 (711)
7	378 (712)
8	379 (714)
9	379 (714)
10	377 (711)
12	378 (712)
15	376 (709)
17	373 (703)
20	369 (696)

4-4 Justify the assumption of turbulent flow for the water jacket and air gap between the MPC and the transfer cask.

The staff's review of analysis files for transfer configuration shows the applicant assumes turbulent flow in these regions. Adequate justification should be provided in order to model these regions with turbulent flow (for example, since these are enclosures with buoyancy driven flow, Reynolds and Raleigh numbers should be obtained) in order to determine an adequate flow regime.

This information is needed to evaluate compliance with 10 CFR 72.236(f).

<u>**HOLTEC RESPONSE:**</u>

The Raleigh numbers (Ra) are calculated to determine the nature of the flow regime in the following two regions:

(1) Annulus gap between the MPC and the HI-TRAC
(2) Water motion in the water jacket region

The Raleigh numbers for the above two regions are computed as 346 and 1.53×10^9 respectively[4] for an MPC-37 with minimum fuel length loaded to heat load chart 1 in a HI-TRAC VW. The Raleigh numbers indicate that the water motion in the water jacket is in the turbulent regime. This is appropriately modeled in the HI-TRAC VW 3-D CFD model.

However, the Raleigh number is small in the annular gap between the MPC and HI-TRAC, indicating that the flow regime in this region is laminar. The staff is correct in identifying that the viscous air flow in the annular gap is laminar. The normal on-site transfer evaluation of the HI-TRAC is re-evaluated by modeling the annular gap between the MPC and HI-TRAC as laminar. The PCT, however, is unaffected by making this change to the CFD model.

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[4] The detail calculations of the Raleigh numbers in these regions will be provided to the NRC with this response.

4-5 Justify the adequacy of the analytical methods used to perform the HI-STORM UMAX thermal evaluation by validating the methods using data from similar geometry, heat transfer characteristics, and operating conditions.

Due to the uniqueness of the design in terms of heat transfer characteristics and type of flow pattern, the applicant needs to validate the analytical tools used in this design. The validation should use high fidelity data (temperature, mass flow rate, etc.) from an experiment that resembles the HI-STORM UMAX design.

This information is needed to evaluate compliance with 10 CFR 72.236(f).

HOLTEC RESPONSE:

The analytical method used to characterize the thermal performance of HI-STORM UMAX uses the same Fluent CFD platform as was used for the HI-STORM 100U system (certified in 2009) with which it shares a common anatomical geometry. In fact, every aspect of the "UMAX" model is based on a previously used model that underlies a prior affirmative safety evaluation by the USNRC.

The above said, no thermal performance data is yet available for the HI-STORM UMAX system which has not yet been built. However, consistent with the prior practice in the HI-STORM 100 docket, the air flow test at sub- design heat load are specified (via the Technical Specification) to confirm the accuracy (rather the conservatism) of the thermal model used to predict "UMAX's" performance. In this manner, the veracity of Holtec's safety analysis (and of NRC's safety evaluation) is confirmed at sub-par heat loads before any system at the Design Basis heat duty is loaded. For the HI-STORM 100 System, such an air flow test measurement was conducted at the ANO site which was used to benchmark the CFD thermal model developed in the HI-STORM 100 FSAR. Holtec has proposed a similar test regimen for the first loaded UMAX System with some modifications based on the experience gained during the air flow measurement tests performed for the HI-STORM 100 System.

Based on the discussion with NRC staff, the air mass flow rate through the cooling passages of a loaded UMAX VVM will be determined by direct measurements of the air mass flow velocity at the air flow outlets using a calibrated thermal gauge. Letters summarizing the results of each thermal validation test and analysis shall be submitted to the NRC in accordance with 10 CFR 72.4.

In this context, we should observe that the following modification will occur to texts in CoC, Condition 8 (Special Requirements for First Systems in Place): A thermal acceptance test shall be performed in accordance with Section 10.3 of the HI-STORM UMAX FSAR on the first loaded MPC whose aggregate heat load is equal to 80% of the Design Basis MPC heat load. The measured thermal performance of the storage system shall be used to benchmark the computational fluid mechanics model used in the safety analysis in Chapter 4 of the HI-STORM UMAX FSAR." Similar modification will be made to the HI-STORM UMAX FSAR Section 10.3 to reflect these changes.

The above provisions are expressly included to validate the safety analysis model for UMAX *before* the system is subject to a heat duty that is anywhere near approaching its certified value. Thus the thermal capacity of the system is confirmed by real life test data from the actual system under conditions that are non- threatening to the PCT limit.

ATTACHMENT 2 TO LETTER # 5021014
INPUT AND OUTPUT FILES OF THE
THERMAL-HYDRAULIC EVALUATION OF HI-STORM UMAX

MPC-37

Sub-Design Basis Heat Load

G:\Projects\5021\REPORTS\Thermal Reports\Revision 3\fluent\sub-design

08/26/2013	03:59 PM	232,187,698	umax-mpc37-min-mesh3-90hl-sub90-r3.cas
08/26/2013	04:00 PM	3,683,111,890	umax-mpc37-min-mesh3-90hl-sub90-r3.dat
08/27/2013	07:45 AM	232,187,112	umax-mpc37-min-threshold-r3.cas
08/27/2013	07:47 AM	3,683,174,290	umax-mpc37-min-threshold-r3.dat
08/26/2013	11:09 AM	3,627	udf-mpc37-min-threshold-r3.c

Miscellaneous

G:\Projects\5021\REPORTS\Thermal Reports\Revision 3

08/27/2013	03:06 PM	81,920	mpc-pres-umax-R3-rai-2.xls
08/26/2013	11:08 AM	31,744	heat-gen-rate-umax-threshold-R3.xls

Wind

G:\Projects\5021\REPORTS\Thermal Reports\Revision 3\gambit

07/31/2013	01:35 PM	844,902,400	umax-mpc37-min-mesh3-back-panelgap.dbs
07/31/2013	01:44 PM	952,045,096	umax-mpc37-min-mesh3-back-panelgap.msh
07/31/2013	03:12 PM	844,881,920	umax-mpc37-min-mesh3-front-panelgap.dbs
07/31/2013	03:50 PM	952,045,102	umax-mpc37-min-mesh3-front-panelgap.msh

G:\Projects\5021\REPORTS\Thermal Reports\Revision 3\fluent\wind\half model

Additional Half Symmetric Detail Model

07/31/2013	11:34 AM	491,954,783	umax-mpc37-min-mesh3-half-90hl-12mile.cas
07/31/2013	11:36 AM	7,611,371,141	umax-mpc37-min-mesh3-half-90hl-12mile.dat
08/01/2013	08:57 AM	491,954,809	umax-mpc37-min-mesh3-half-90hl-15mile.cas
08/01/2013	08:59 AM	7,611,329,861	umax-mpc37-min-mesh3-half-90hl-15mile.dat
08/01/2013	08:54 AM	491,954,809	umax-mpc37-min-mesh3-half-90hl-17mile.cas
08/01/2013	08:56 AM	7,611,315,845	umax-mpc37-min-mesh3-half-90hl-17mile.dat
08/03/2013	11:19 AM	491,954,801	umax-mpc37-min-mesh3-half-90hl-20mile.cas
08/03/2013	11:20 AM	7,611,359,813	umax-mpc37-min-mesh3-half-90hl-20mile.dat
08/04/2013	08:32 AM	491,954,859	umax-mpc37-min-mesh3-half-90hl-8mile.cas
08/04/2013	10:34 AM	7,611,331,973	umax-mpc37-min-mesh3-half-90hl-8mile.dat
08/05/2013	08:55 AM	491,954,806	umax-mpc37-min-mesh3-half-90hl-9mile.cas
08/05/2013	08:57 AM	7,611,320,261	umax-mpc37-min-mesh3-half-90hl-9mile.dat

G:\Projects\5021\REPORTS\Thermal Reports\Revision 3\fluent\wind\full model

Full Detail Model

08/19/2013	10:50 AM	1,004,775,338	umax-mpc37-min-mesh3-full-90hl-7mile-revised-t_s-24000-CONVERGED.cas
08/19/2013	04:20 AM	15,246,169,143	umax-mpc37-min-mesh3-full-90hl-7mile-revised-t_s-24000-CONVERGED.dat

ATTACHMENT 2 TO LETTER # 5021014
INPUT AND OUTPUT FILES OF THE
THERMAL-HYDRAULIC EVALUATION OF HI-STORM UMAX

HI-TRAC
G:\Projects\5021\REPORTS\Thermal Reports\Revision 3\fluent\hi-trac
08/12/2013 07:25 PM 142,400,970 hitrac-water-6.2atm-90hl-laminar.cas
08/12/2013 07:27 PM 2,390,702,535 hitrac-water-6.2atm-90hl-laminar.dat

G:\Projects\5021\REPORTS\Thermal Reports\Revision 3
08/12/2013 04:02 PM 11,048 Raleigh.xlsx

Vacuum Drying
Directory of G:\Projects\5021\REPORTS\Thermal Reports\Revision 3\fluent\vacuum
06/20/2013 08:50 AM 51,772,398 MPC37-VACDRY-PF1.2-panelgap-revised-33.46kw.cas
06/20/2013 05:05 AM 990,767,851 MPC37-VACDRY-PF1.2-panelgap-revised-33.46kw.dat
06/19/2013 03:09 PM 3,461 udf-mpc37-min-pf1.2-33.46kw.c

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Document ID 5021014
Non-Proprietary Attachment 3

AFFIDAVIT PURSUANT TO 10 CFR 2.390

I, Nick Abraczinskas, 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 Attachment 2 to Holtec Letter 5021014, 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).

AFFIDAVIT PURSUANT TO 10 CFR 2.390

(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

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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.

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

Nick Abraczinskas, being duly sworn, deposes and says:

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

Executed at Marlton, New Jersey, this 29th day of August, 2013.

Nick Abraczinskas
Vice President of Contracts
Holtec International

Subscribed and sworn before me this 29th day of August, 2013.

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

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