



**Pacific Gas and  
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November 22, 2011

PG&E Letter DIL-11-006

U.S. Nuclear Regulatory Commission  
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Rockville, MD 20852

Materials License No. SNM-2511, Docket No. 72-26  
Diablo Canyon Independent Spent Fuel Storage Installation  
Modification and Supplement to the Diablo Canyon Independent Spent Fuel Storage  
Installation License Amendment Request 11-001

References:

1. PG&E Letter DIL-11-001, "License Amendment Request 11-001, Revision to Technical Specifications 1.1, 2.0, 3.1.1, 3.1.2, 4.1.2, and 5.1.3; Addition of Technical Specifications 2.3 and 3.1.4; and, Request for an Exemption from the Requirements of 10 CFR 72.236(f)," dated January 31, 2011
2. PG&E Letter DIL-11-003, "Supplement to License Amendment Request 11-001, Revision to Technical Specifications 1.1, 2.0, 3.1.1, 3.1.2, 4.1.2, and 5.1.3; Addition of Technical Specifications 2.3 and 3.1.4; and, Request for an Exemption from the Requirements of 10 CFR 72.236(f)," dated June 8, 2011
3. PG&E Letter DIL-11-004, "Supplement No. 2 to License Amendment Request 11-001, Revision to Technical Specifications 1.1, 2.0, 3.1.1, 3.1.2, 4.1.2, and 5.1.3; Addition of Technical Specifications 2.3 and 3.1.4; and, Request for an Exemption from the Requirements of 10 CFR 72.236(f)," dated July 28, 2011
4. PG&E Letter DIL-11-005, "Response to NRC Request for Additional Information Pertaining to Diablo Canyon Independent Spent Fuel Storage Installation (ISFSI) License Amendment Request 11-001," dated September 15, 2011

115526



Dear Commissioners and Staff:

By letter dated January 31, 2011 (Reference 1), Pacific Gas and Electric Company (PG&E) submitted License Amendment Request (LAR) 11-001 to the Nuclear Regulatory Commission (NRC), which proposed to revise Technical Specifications (TS) 1.1, "Definitions," TS 2.0, "Approved Contents," TS 3.1.1, "Multi-purpose Canister (MPC)," TS 3.1.2, "Spent Fuel Storage Cask (SFSC) Heat Removal System," TS 3.1.4 (new), "Supplemental Cooling System," TS 4.1.2, "Design Features Important to Criticality Control," and TS 5.1.3, "MPC and SFSC Loading, Unloading, and Preparation Program."

During the review of the January 31, 2011, submittal, the NRC expressed concerns related to the thermal analysis methodology. By draft letter received November 17, 2011, "Diablo Canyon Independent Spent Fuel Storage Installation Materials License No. SNM-2511, Amendment Request No. 2 – Second Request for Additional Information, Part 1 (TAC NO. L24515)," the NRC provided a request for additional information on the thermal analysis previously submitted. To eliminate the NRC concerns, PG&E is modifying the January 31, 2011, submittal to limit the loading of high burn-up fuel to less than or equal to a 24 kilowatt (kW) heat load based on a uniform loading of 750 watts (W) fuel assemblies and is providing supplemental information in support of this modification. All the other proposed TS changes in LAR 11-001 and supporting information provided in References 1, 2, 3, and 4 still apply. This supplement modifies the TS in the following areas:

- (1) TS 2.0, "Approved Contents," Table 2.1-7 Fuel Assembly Cooling and Maximum Decay Heat (Uniform Fuel loading) for a MPC - 32 is being revised to limit the decay heat load to 750 W per assembly for a canister containing high burn-up fuel.
- (2) TS 2.0, "Approved Contents," the previous proposed changes in LAR 11-001 to Tables 2.1-8 and 2.1-9 are no longer being requested.
- (3) TS 2.0, "Approved Contents," deleted reference to Table 2.1-9 as regionalized loading of high burn-up fuel is not being requested, and changed the watts in the sample to 750 to be consistent with the license amendment being requested.

The Enclosure to this letter provides five attachments. Attachment 1 of the Enclosure contains Holtec International Report HI-2104625, "Three Dimensional Thermal-Hydraulic Analyses for Diablo Canyon Site-Specific HI-STORM System Design," Revision 9 – Proprietary Version, with one disc of proprietary data files on optical storage medium (OSM) DVD-ROM.



Attachment 2 of the Enclosure contains an affidavit signed by Holtec, the owner of the proprietary information. The affidavit sets forth the basis on which the Holtec information contained in Attachment 1 of the Enclosure, may be withheld from public disclosure by the Commission consistent with the Freedom of Information Action ("FOIA"), 5 USC Section 552(b)(4) and the Trade Secrets Act, 18 USC Section 1905, and NRC regulations 10 CFR 9.17(a)(4), 2.390(a)(4), and 2.390(b)(1). PG&E requests that the Holtec proprietary information be withheld from public disclosure in accordance with these laws and regulations.

Attachment 3 of the Enclosure contains Holtec International Report HI-2104625, "Three Dimensional Thermal-Hydraulic Analyses for Diablo Canyon Site-Specific HI-STORM System Design," Revision 9 (Nonproprietary version).

Attachment 4 is a markup of the affected TS pages, and Attachment 5 is a clean retyped version of revised TS pages. These two attachments contain all affected pages of the TS including those submitted in Reference 1 and are unchanged by this submittal for completeness.

Correspondence with respect to the proprietary aspects of the application or the Holtec affidavit provided in Attachments 1 and 2 of the Enclosure should be addressed to Ms. Kelly Kozink, Holtec International, 555 Lincoln Drive West, Marlton, New Jersey, 08053.

The changes in this LAR are required to allow the loading of high burnup spent fuel that will allow adequate space in the spent fuel pool for the upcoming spring 2012 refueling outage. PG&E requests approval of this LAR be assigned an expedited priority for review and approval, and requests that the amendment be issued no later than December 15, 2011. PG&E requests the license amendment be made effective upon NRC issuance, to be implemented within 60 days of issuance.

PG&E makes no regulatory commitments (as defined by NEI 99-04) in this letter. This letter includes no revisions to existing regulatory commitments.

This information modifies the inputs, but does not affect the no significant hazards consideration determination previously transmitted in Reference 1.

If you have any questions regarding this response, please contact Mr. Lawrence Pulley at (805) 545-6165.



Document Control Desk  
November 22, 2011  
Page 4

PG&E Letter DIL-11-006

I state under penalty of perjury that the foregoing is true and correct.

Executed on November 22, 2011.

Sincerely,

A handwritten signature in black ink, appearing to read 'James R. Becker', written over a horizontal line.

James R. Becker  
*Site Vice President*

prs/50440875

Enclosure w/Attachments

cc: Diablo Distribution

cc/enc: John Goshen, NRC Project Manager, Division of Spent Fuel  
Storage and Transportation

Kelly Kozink, Holtec International Project Manager

Michael S. Peck, NRC Senior Resident Inspector

**Enclosure**  
**Modification and Supplement to the Diablo Canyon Independent**  
**Spent Fuel Storage Installation (ISFSI) License Amendment**  
**Request 11-001**

**Summary Description**

By letter dated January 31, 2011 (Reference 1), Pacific Gas and Electric Company (PG&E) submitted License Amendment Request (LAR) 11-001 to the Nuclear Regulatory Commission (NRC), which proposed to revise Technical Specifications (TS) 1.1, "Definitions," TS 2.0, "Approved Contents," TS 3.1.1, "Multi-purpose Canister (MPC)," TS 3.1.2, "Spent Fuel Storage Cask (SFSC) Heat Removal System," TS 3.1.4 (new), "Supplemental Cooling System," TS 4.1.2, "Design Features Important to Criticality Control," and TS 5.1.3, "MPC and SFSC Loading, Unloading, and Preparation Program."

During the review of the January 31, 2011, submittal, the NRC expressed concerns related to the thermal analysis methodology. By draft letter received November 17, 2011, "Diablo Canyon Independent Spent Fuel Storage Installation Materials License No. SNM-2511, Amendment Request No. 2 – Second Request for Additional Information, Part 1 (TAC NO. L24515)," the NRC provided a request for additional information (RAI) on the thermal analysis previously submitted. To eliminate the NRC concerns, PG&E is modifying the January 31, 2011, submittal to limit the loading of fuel to less than or equal to a 24 kilowatt (kW) heat load based on a uniform loading of 750 watts (W) fuel assemblies and is providing supplemental information in support of this modification. All the other proposed TS changes in LAR 11-001 and supporting information provided in References 1, 3, 4, and 6 still apply. This supplement modifies the TS in the following areas:

1. TS 2.0, "Approved Contents," Table 2.1-7, "Fuel Assembly Cooling and Maximum Decay Heat (Uniform Fuel loading)," for a MPC - 32 is being revised to limit the decay heat load to 750 W per assembly for a canister containing high burn-up fuel.
2. TS 2.0, "Approved Contents," the previous proposed changes in LAR 11-001 to Tables 2.1-8 and 2.1-9 are no longer being requested.
3. TS 2.0, "Approved Contents," deleted reference to Table 2.1-9 as regionalized loading of high burn-up fuel is not being requested, and changed the watts in the sample to 750 to be consistent with the license amendment being requested.

This proposed modification to the January 31, 2011, LAR 11-001 submittal will allow loading of a thermally-limited subset of DCCP's high burn-up fuel inventory in the

short term. A new license amendment request will be submitted at a later date to include the remaining high burn-up fuel inventory.

### **Background and Summary Evaluation**

By letter dated January 31, 2011 (Reference 1), PG&E submitted LAR 11-001 to the NRC. By NRC letter dated April 14, 2011, "Diablo Canyon Independent Spent Fuel Storage Installation Materials License No. SNM-2511, Amendment Request No. 2 – Acceptance Review (TAC NO. L24515)," the NRC staff performed an acceptance review of the application to determine if the application contained sufficient technical information in scope and depth to allow the staff to complete the detailed technical review. The letter acknowledged acceptance of PG&E's application (Reference 2).

In the acceptance letter the NRC staff included observations that may be asked at a later date, noting that responses to observations are not required for the staff to begin a detailed technical review. On June 8, 2011, PG&E submitted a supplement to the application addressing the observations (Reference 3), and committing to a second supplement of the application to submit a revised thermal report addressing a FLUENT computer code issue by July 30, 2011. On July 28, 2011, PG&E submitted the second supplement to the application in accordance with the commitment (Reference 4).

On August 16, 2011, the NRC staff requested additional information required to complete its review of LAR 11-001 (Reference 5). On September 15, 2011, PG&E's response to the August 16, 2011, NRC RAI (Reference 6), including a removal of the Request for an Exemption from the Requirements of 10 CFR 72.236(f), which was transmitted in January 31, 2011, LAR 11-001 submittal.

Additional discussions with NRC staff have raised questions regarding the modeling detail performed in the supporting analysis, and the resulting small margin to peak cladding temperature (PCT), especially while operations in the cask transfer facility are taking place. In a draft letter received November 17, 2011, "Diablo Canyon Independent Spent Fuel Storage Installation Materials License No. SNM-2511, Amendment Request No. 2 – Second Request for Additional Information, Part 1 (TAC NO. L24515)," the NRC provided the following RAI on the thermal analysis previously submitted (Reference 7):

#### **NRC Question:**

- 6.1A *Clarify if the calculation of the grid convergence index (GCI) described in Appendix F to Holtec Report HI-2104625 for both normal condition of storage and cask transfer facility configuration followed the procedure described in American Society of Mechanical Engineers Verification and Validation 20-2009 (ASME V&V 20-2009), "Standard for Verification and Validation in Computational Fluid Dynamics and Heat Transfer".*

*The calculation of the GCI provided in HI-2104625 does not use different grids for the entire domain. It focuses only in the annulus region between the Multipurpose Canister (MPC) and the overpack. Since there is fluid-solid interaction inside the MPC and fluid-solid interaction in the annular region, the mesh refinement should consider the entire domain. The grid size for the different meshes is not calculated according to the procedure described in ASME V&V 20-2009. Also when performing grid refinement the criteria described in ASME V&V 20-2009 should be followed.*

*Per ASME V&V 20-2009, when using the GCI method to estimate the discretization error, the following criteria should be met:*

- The solution from the different grids used display monotonic convergence.*
- The solution from the different grids used should be in the asymptotic range.*

*To test for that:*

- A minimum of four grids is required to demonstrate that the observed order of accuracy 'p' is constant for a simulation series. In fact, it may require more than four grids to convincingly demonstrate asymptotic response in difficult problems, possibly five or six grid resolutions in cases where the convergence is noisy. (ASME V&V 20-2009).*
- The observed order of accuracy 'p' has to be comparable to the expected order of accuracy of the method.*
- If order of accuracy 'p' is not consistent, then by engineering practice the factor of safety (Fs) should be equal to 3.*

*This information is necessary to verify compliance with 10 CFR 72.122 and 72.128.*

*Or*

- 6.1B** *Provide a revised thermal calculation justifying that adequate thermal margin is maintained for the HI-2104625 Table B.5.9 Scenario 1 (cask transfer facility (CTF)) configuration without utilizing the GCI approach in HI-2104625.*

*The GCI approach used in HI-2104625 is currently undergoing detailed staff evaluation, and it appears that it may not conform to current accepted industry practices. The staff has noted that Scenario 1 uses a maximum MPC – 32 heat load of 28.74 kw in the analysis. It is possible that the actual maximum DC site specific heat MPC – 32 heat load could be used versus the theoretical maximum heat load of 28.74 kw for the calculation which may provide significant calculated thermal margin without the use of GCI methodology.*

*This information is necessary to verify compliance with 10 CFR 72.122 and 72.128.*

**PG&E Response:**

PG&E elects to resolve this question utilizing the approach outlined in Question 6.1B. PG&E is proposing modification to the January 31, 2011, LAR 11-001 submittal. The proposed modification limits the loading of high burn-up fuel to less than or equal to a 24 kW heat load based on a uniform loading of 750 W fuel assemblies. In support of this limitation, the documents included in Attachments 1 and 3 have been revised utilizing standard computer calculation methodology and demonstrate that there is in excess of 50 degrees Celsius of margin in PCT.

**NRC Question:**

6.2 *Clarify why there are two different temperatures limits for the MPC basket for both normal condition of storage and CTF configuration.*

*Table B.5.10 of HI-2104625 includes an MPC basket temperature of 385°C while Table B.5.17 gives a value of 510°C. Both configurations are intended to be long term storage and as such the temperature limits should be equal (even though the licensee intends to use the CTF for transferring the MPC to the overpack, the application states that the HI-STORM can be loaded inside the CTF for an indefinite time for the Diablo Canyon design basis maximum heat load of up to 28.74 kW). Therefore, this configuration should not be considered off-normal and should use temperature limits for normal conditions of storage.*

*This information is necessary to verify compliance with 10 CFR 72.122 and 72.128*

**PG&E Response:**

PG&E concurs with the question. Revision 9 of Calculation HI-2104625 (Attachment 1) performed as part of the response to Question 6.1B above has corrected the table (B.5.18) to use temperature limits for normal conditions of storage in the CTF with the heat load up to 24 kW.

PG&E intends to submit an additional LAR to address loading high burn-up fuel with a heat load above 24 kW at a later date. In that LAR submittal PG&E will specifically address the draft letter received November 17, 2011, RAI questions on thermal modeling for heat loads above 24 kW.

The proposed modifications are a subset of the LAR 11-001 requested changes and are more limiting. As a result, the proposed changes do not adversely affect the results of the technical evaluation or the no significant hazards consideration determination previously transmitted in the January 31, 2011, LAR 11-001 submittal.

In support of this proposed modification, PG&E has attached the following documents:



Attachment 1- Contains Holtec International Report HI-2104625, "Three Dimensional Thermal-Hydraulic Analyses for Diablo Canyon Site-Specific HI-STORM System Design," Revision 9 – Proprietary Version, with one disc of proprietary data files on optical storage medium (OSM) DVD-ROM.

Attachment 2 - Contains an affidavit signed by Holtec, the owner of the proprietary information. The affidavit sets forth the basis on which the Holtec information contained in Attachment 1 of the Enclosure, may be withheld from public disclosure by the Commission consistent with the Freedom of Information Action ("FOIA"), 5 USC Section 552(b)(4) and the Trade Secrets Act, 18 USC Section 1905, and NRC regulations 10 CFR 9.17(a)(4), 2.390(a)(4), and 2.390(b)(1). PG&E requests that the Holtec proprietary information be withheld from public disclosure in accordance with these laws and regulations.

Attachment 3 - Contains Holtec International Report HI-2104625, "Three Dimensional Thermal-Hydraulic Analyses for Diablo Canyon Site-Specific HI-STORM System Design," Revision 9 (Nonproprietary version).

Attachment 4 - Contains TS page marked ups.

Attachment 5 - Contains retyped TS pages.

Note: Attachments 4 and 5 contain all affected pages of the TS including those submitted with the LAR 11-001 submittal. With the exception of the proposed modifications provided in this submittal, all the remaining previously submitted TS changes in LAR 11-001 are unchanged. They are provided here for completeness.

### **References**

1. PG&E Letter DIL-11-001, "License Amendment Request 11-001, Revision to Technical Specifications 1.1, 2.0, 3.1.1, 3.1.2, 4.1.2, and 5.1.3; Addition of Technical Specifications 2.3 and 3.1.4; and, Request for an Exemption from the Requirements of 10 CFR 72.236(f)," dated January 31, 2011
2. NRC letter dated April 14, 2011, "Diablo Canyon Independent Spent Fuel Storage Installation Materials License No. SNM-2511, Amendment Request No. 2 – Acceptance Review (TAC NO. L24515)"
3. PG&E Letter DIL-11-003, "Supplement to License Amendment Request 11-001, Revision to Technical Specifications 1.1, 2.0, 3.1.1, 3.1.2, 4.1.2, and 5.1.3; Addition of Technical Specifications 2.3 and 3.1.4; and, Request for an Exemption from the Requirements of 10 CFR 72.236(f)," dated June 8, 2011
4. PG&E Letter DIL-11-004, "Supplement No. 2 to License Amendment Request 11-001, Revision to Technical Specifications 1.1, 2.0, 3.1.1, 3.1.2, 4.1.2, and 5.1.3; Addition of Technical Specifications 2.3 and 3.1.4; and, Request for an Exemption from the Requirements of 10 CFR 72.236(f)," dated July 28, 2011

5. NRC letter dated August 16, 2011, "Diablo Canyon Independent Spent Fuel Storage Installation Materials License No. SNM-2511, Amendment Request No. 2 – First Request For Additional Information (TAC NO. L24515)"
6. PG&E Letter DIL-11-005, "Response to NRC Request for Additional Information Pertaining to Diablo Canyon Independent Spent Fuel Storage Installation (ISFSI) License Amendment Request 11-001," dated September 15, 2011
7. NRC draft letter received November 17, 2011, "Diablo Canyon Independent Spent Fuel Storage Installation Materials License No. SNM-2511, Amendment Request No. 2 – Second Request For Additional Information, Part 1 (TAC NO. L24515)"

**Holtec Affidavit for Holtec International Report HI-2104625, "Three Dimensional Thermal-Hydraulic Analyses for Diablo Canyon Site-Specific HI-STORM System Design," Revision 9 – Proprietary Version, with one disc of proprietary data files on optical storage medium (OSM) DVD-ROM**



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**AFFIDAVIT PURSUANT TO 10 CFR 2.390**

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I, Kelly Kozink, depose and state as follows:

- (1) I am the Holtec International Project Manager for the Diablo Canyon Independent Spent Fuel Storage Installation Project and 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 Revision 9 of Holtec Report HI-2104625 and the accompanying CD-ROM with computer data files therefrom, which contains Holtec Proprietary information and is appropriately marked as such.
- (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



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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 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



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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 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.



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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.

Executed at Marlton, New Jersey, this 22<sup>nd</sup> day of November, 2011.

  
Kelly Kozink  
Holtec International