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Proprietary Information – Withhold From Public Disclosure Under 10 CFR 2.390

RS-14-229

August 12, 2014

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

Quad Cities Nuclear Power Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Additional Information Regarding License Amendment Request Associated with Use of Neutron Absorbing Inserts in Spent Fuel Pool Storage Racks

References:

1. Letter from D. M. Gullott (Exelon Generation Company, LLC) to U.S. NRC, "License Amendment Request – Use of Neutron Absorbing Inserts in Units 1 and 2 Spent Fuel Pool Storage Racks," dated July 16, 2013

2. Email from B. Mozafari (U.S. NRC) to K. Nicely (Exelon Generation Company, LLC), "FW: Draft RAI from TAC NOS. MF2489 AND MF2490 review on NEUTRON ABSORBING INSERTS," dated June 23, 2014 (ADAMS Accession No. ML14203A613)

In Reference 1, Exelon Generation Company, LLC (EGC) requested a license amendment to modify the Technical Specifications (TS) to include the use of neutron absorbing spent fuel pool rack inserts (i.e., NETCO-SNAP-IN® rack inserts) for the purpose of criticality control in the spent fuel pools (SFPs) at Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2. This change was requested due to the degradation of the Boraflex neutron absorbing material, currently being used in the QCNPS SFPs.

The NRC requested additional information that is needed to complete the safety evaluation in Reference 2. In response to this request, EGC is providing the attached information.

Attachment 2 contains information proprietary to Holtec International, and is supported by an affidavit signed by Holtec International. The affidavit, provided in Attachment 4, sets forth the basis on which the information may be withheld from public disclosure by the NRC and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR 2.390, "Public inspections, exemptions, requests for withholding." Accordingly, it is requested that the information be withheld from public disclosure in accordance with 10 CFR 2.390. A non-proprietary version of Attachment 2 is provided in Attachment 5.

Attachment 2 Contains Proprietary Information. Withhold From Public Disclosure Under 10 CFR 2.390. When separated from Attachment 2, this document is decontrolled.

EGC has reviewed the information supporting a finding of no significant hazards consideration, and the environmental consideration, that were previously provided to the NRC in Attachment 1 of Reference 1. The additional information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. In addition, the additional information provided in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this letter, please contact Mr. Kenneth M. Nicely at (630) 657-2803.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 12th day of August 2014.

Respectfully,

Patrick R. Simpson

Patrick R. Simpson
Manager – Licensing

Attachments:

1. Response to Request for Additional Information
2. Holtec International Document RRTI-2127-002R0, "Attachment A (PROPRIETARY VERSION) Holtec Responses to Request for Additional Information for Quad Cities Criticality Insert Analysis" (PROPRIETARY INFORMATION)
3. Updated Markup of Technical Specifications Page
4. Holtec International Affidavit
5. Holtec International Document RRTI-2127-002R0, "Attachment B (NON-PROPRIETARY VERSION) Holtec Responses to Request for Additional Information for Quad Cities Criticality Insert Analysis" (Non-Proprietary Version)

cc: NRC Regional Administrator, Region III
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station
Illinois Emergency Management Agency – Division of Nuclear Safety

NRC Request 1

RAI 1-3 indicated that it was possible for a coupon to degrade without failing the minimum areal density criteria, and requests further detail on how the surveillance program will guarantee that any degradation is addressed before the safety function of the inserts installed in the SFP is affected. The response briefly summarizes the planned testing and states that any changes in the material properties will be identified early. NRC staff interprets the response to imply that the intent of the surveillance program is to identify when degradation occurs and use the Corrective Action Program to address any degradation. As such, the goal of the proposed surveillance program is to confirm that degradation is not occurring, not to verify the acceptability of any degradation. If this interpretation is correct, then the acceptance criteria for the B-10 areal density in Table 3.9-3 in Attachment 1 to the License Amendment Request letter transmitted to the NRC on July 16, 2013 is not consistent with the intent of the surveillance program. A minimum areal density value is provided, but no criterion associated with a possible change in areal density is included. Please update Table 3.9-3 with an appropriate criterion, or explain why a minimum areal density value for the coupon is sufficient as an acceptance criterion for verifying acceptable performance of all inserts in the SFP.

Response

The intent of the long term surveillance program is to confirm that the areal density of the inserts remains equal to or greater than the areal density input in the criticality analysis. Measures of material performance beyond areal density are included in the surveillance program to aid in anticipating changes in areal density. The additional criteria include changes in thickness of the coupons, overall dimensions of the coupon, weight, density, corrosion, and visual inspection, as shown in Table 3.9-3 from Attachment 1 of Reference 1.

To ensure changes in areal density are documented and reviewed, Table 3.9-3 from Attachment 1 of Reference 1 is revised to include a line item for Areal Density with an Acceptance/Rejection Criteria of "Any change of +/- 5 percent." The revised Table 3.9-3 is shown below. Observed changes beyond this criterion will be entered in the Corrective Action Program for evaluation and final disposition.

Table 3.9-3
Long-Term Surveillance General and Galvanic Coupon Characterization

Test	Pre-Characterization	Post-Characterization	Acceptance / Rejection Criteria
Visual (high resolution digital photo)	√	√	Evidence of visual indications
Dimension	√	√	Min. thickness: 0.005 inch less than nominal thickness * Length Change: Any change of +/- 0.02 inch * Width Change: Any change of +/- 0.02 inch Thickness Change: Any change of +0.010 inch / - 0.004 inch
Dry Weight	√	√	Any change of +/- 5 percent
Density	√	√	Any change of +/- 5 percent
Areal Density	√	√	Any change of +/- 5 percent
Areal Density	√	√	0.0116 Boron-10 g/cm^2 minimum loading
Acid Cleaning		√	N/A
Weight Loss		√	Any change of +/- 5 percent
Corrosion Rate		√	< 0.05 mil/yr
Microscopy		√ **	At the discretion of the test engineer

* Acceptance criteria for length and width change are for general coupons only.
** At the presence of anomalies

NRC Request 2

In the spent fuel pool (SFP), the spent fuel stored in the racks must comply with the regulations to remain subcritical. In the case of Quad Cities, they are licensed under 10 CFR 50.68 "Criticality Accident Requirements." This regulation states that:

If no credit for soluble boron is taken, the k-effective of the spent fuel storage racks loaded with fuel of the maximum fuel assembly reactivity must not exceed 0.95, at a 95 percent probability, 95 percent confidence level, if flooded with unborated water.

To demonstrate compliance with the regulation, the licensee has performed a nuclear criticality safety (NCS) analysis of record (AOR). In this NCS AOR, Quad Cities has credited neutron absorber material (NAM) in the analysis to help maintain subcriticality. In order to ensure that the NAM will remain within the assumptions used in the NCS AOR, a Surveillance Program to identify and monitor any degradation is in place or is planned to be implemented in the near future. These programs will confirm that the NAM will perform as designed for in the NCS AOR.

The staff questions the amount of information described in Quad Cities' proposed Technical Specifications (TS) in regard to the NAM and its Surveillance Programs. In particular, NAM need to be monitored and degradation mitigated in the SFP to ensure that the assumptions in the SFP NCS AOR and thereby the TS 4.3.1 are not challenged. Since the materials are integral to the compliance of the TS 4.3.1 and the regulations, the requirement to monitor the NAM should be reflected in the TS in addition to the areal density of the NAM.

Please provide a TS Surveillance for the SFP NAM that will confirm that the materials will perform as designed for in the NCS AOR.

Note: In justification for having a neutron absorbers and its surveillance programs in TS, please see 10 CFR 50.36 (c)(2)(ii)(B), where it states:

Criterion 2. A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Furthermore 10 CFR 50.36(c)(2)(ii)(C) states:

Criterion 3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that wither assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Response

Exelon Generation Company, LLC (EGC) recognizes the importance of monitoring NAM to ensure that TS 4.3.1 and thereby the assumptions in the SFP NCS AOR are not challenged. In light of this recognition, EGC has developed a detailed Rack Insert Surveillance Program as described in Attachment 1, Section 3.9, of Reference 1. The intent of the long term surveillance program is to confirm that the areal density of the inserts remains equal to or greater than the areal density input in the criticality analysis. In response to the NRC's request to provide a TS Surveillance for the SFP NAM, EGC has evaluated the 10 CFR 50.36 criteria cited in the NRC Request as discussed below.

10 CFR 50.36 describes the contents of the Technical Specifications. Paragraph (b) of 10 CFR 50.36 states:

> The technical specifications will be derived from the analyses and evaluation included in the safety analysis report, and amendments thereto, submitted pursuant to § 50.34. The Commission may include such additional technical specifications as the Commission finds appropriate.

Paragraph (c) of 10 CFR 50.36 provides the categories of Technical Specifications, which includes:

i. Safety limits and limiting safety system settings,
ii. Limiting conditions for operation,
iii. Surveillance requirements,
iv. Design features, and
v. Administrative controls.

10 CFR 50.36(c)(2) states:

> Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.

10 CFR 50.36(c)(2)(ii) requires a technical specification limiting condition for operation of a nuclear reactor to be established for each item meeting one or more of the criteria listed in that paragraph. The NRC Request above refers to Criterion 2 and Criterion 3 of 10 CFR 50.36(c)(2)(ii) in justification for having neutron absorbers and its surveillance programs in TS.

EGC has concluded that the neutron absorbers in the spent fuel pool do not meet these criteria for the reasons discussed below, and as such, a technical specification limiting condition for operation is not required.

<u>Criterion 2</u>: A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

> The NRC stated in their "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors," 58 FRN 39132, July 22, 1993, (herein referred to as the "Final Policy Statement"):
>
>> [S]ince 1969 there has been a trend towards including in technical specifications not only those requirements derived from the analyses and evaluation included in the plant's safety analysis report but also essentially all other NRC requirements governing the operation of nuclear power plants.
>>
>> This is due in part to a lack of well-defined criteria for what should be included in technical specifications and has contributed to the volume of technical specifications and to the several-fold increase in the number of license amendment applications to effect changes in the technical specifications.
>>
>> In the Commission's view, this has diverted both NRC staff and licensee attention from the more important requirements in these documents to the extent that it has resulted in <u>an adverse but unquantifiable impact on safety</u>. (emphasis added)

To alleviate this adverse impact on safety, the NRC promulgated criteria in the Final Policy Statement that circumscribe the requirements that are to be included in the Technical Specifications. These criteria were later incorporated into the regulations under 10 CFR 50.36(c)(2)(ii). It is worthwhile to note that the Statements of Consideration for this rule change stated, "The Commission has decided not to withdraw the final policy statement because it contains detailed discussions of the four criteria and guidance on how the NRC staff and licensees should apply the criteria."

The Final Policy Statement describes and provides discussion of each of the four criteria later added to 10 CFR 50.36. The discussion of Criterion 2 states, in part:

> Another basic concept in the adequate protection of the public health and safety is that the plant shall be operated within the bounds of the initial conditions assumed in the existing Design Basis Accident and Transient analyses and that the plant will be operated to preclude unanalyzed transients and accidents. These analyses consist of postulated events, analyzed in the FSAR, for which a structure, system, or component must meet specified functional goals.
>
> These analyses are contained in Chapters 6 and 15 of the FSAR (or equivalent chapters) and are identified as Condition II, III, or IV events (ANSI N18.2) (or equivalent) that either assume the failure of or present a challenge to the integrity of a fission product barrier.

Chapter 6 of the NRC Standard Review Plan (which follows the recommended structure of the FSAR) describes Engineered Safety Features. There are no fuel storage structures, systems, or components (SSCs) discussed in Chapter 6.

Chapter 15 of the NRC Standard Review Plan describes Transient and Accident Analysis. There is only one transient or accident analysis related to fuel storage pools, "Radiological Consequences of Fuel Handling Accidents." Neutron absorbers in the spent fuel pool is not an initial condition of a fuel handling accident in the fuel storage pool that assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Accidental criticality in the fuel storage pool is not an ANSI N18.2 Condition II, III, or IV event.

Therefore, neutron absorbers in the spent fuel pool do not meet Criterion 2.

<u>Criterion 3</u>: A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

The Final Policy Statement discussion of Criterion 3 states, in part:

> A third concept in the adequate protection of the public health and safety is that in the event that a postulated Design Basis Accident or Transient should occur, structures, systems, and components are available to function or to actuate in

> order to mitigate the consequence of the Design Basis Accident or Transient. Safety sequence analyses or their equivalent have been performed in recent years and provide a method of presenting the plant response to an accident. These can be used to define the primary success paths.
>
> A safety sequence analysis is a systematic examination of the actions required to mitigate the consequences of events considered in the plant's Design Basis Accident and Transient analyses, as presented in Chapters 6 and 15 of the plant's FSAR (or equivalent chapters.)
>
> It is the intent of this criterion to capture into Technical Specifications <u>only</u> (emphasis added) those structures, systems, and components that are part of the primary success path of a safety sequence analysis.

As discussed above, FSAR Chapter 6 describes Engineered Safety Features which do not discuss fuel storage issues.

Neutron absorbers in the spent fuel pool is not part of the primary success path in a FSAR Chapter 15 safety sequence analysis for a fuel handling accident.

Therefore, neutron absorbers in the spent fuel pool do not meet Criterion 3.

Based on the above, a technical specification limiting condition for operation related to neutron absorbers in the spent fuel pool is not required.

10 CFR 50.36(c)(3) specifies the requirement to include Surveillance Requirements in the technical specifications. The regulation states:

> Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

Surveillance Requirements are associated with limiting conditions for operation. The technical specifications only include Surveillance Requirements when there is a limiting condition for operation associated with a system, structure, component, or variable.

As previously discussed, there is no spent fuel pool neutron absorbers limiting condition for operation, hence the regulatory requirement for a Surveillance Requirement is not applicable.

Based on the discussion above, neither a limiting condition for operation nor a surveillance requirement is warranted for the proposed Rack Insert Surveillance Program. As committed to in Reference 1, EGC will update the UFSAR to describe the Rack Insert Surveillance Program as described in Section 3.9 of Attachment 1 of Reference 1, as updated in response to NRC Request 1 above, upon implementation of the proposed change. Future changes to the Rack Insert Surveillance Program will be evaluated in accordance with EGC's Commitment Management Program and 10 CFR 50.59. In addition, control of the Rack Insert Surveillance

Program in this manner is consistent with the method approved by the NRC previously for LaSalle County Station and Peach Bottom Atomic Power Station.

NRC Request 3

RAI 1-17 requested justification for the use of a code that had not yet been submitted for review by the NRC for reload analysis methods with the SVEA-96 Optima2 fuel assembly, in order to obtain isotopic data for use in the criticality analyses. No specific information was provided to allow NRC staff to determine if CASMO-4 isotopic composition predictions are acceptable for SVEA-96 type lattices. NRC staff agrees that for the most part, the SVEA-96 lattice is comparable to other fuel lattices already approved for use with CASMO-4 in the U.S. However, the water wings are a relatively unique feature, and the SVEA-96 calculation results show a much larger bias between CASMO-4 and MCNP than the GE14 calculations. Appendix C shows the difference between CASMO-4 and MCNP5 calculations to be less than two sigma for the GE14 fuel design, while comparison of Tables 7.1(a) and 7.2(a) shows that the difference can approach the 20-sigma threshold for the SVEA-96 fuel design. This suggests that the heterogeneities of the SVEA-96 Optima2 fuel lattice may require special modeling considerations or treatment that is substantially different from that of other fuel assembly designs. Please provide evidence that the CASMO-4 code would be expected to compute isotopic quantities comparable to codes previously approved by the NRC for use in reload analysis of SVEA-96 Optima2 fuel.

Response

Response is provided in Attachment 2.

NRC Request 4

The response to the RAIs does not appear to include an updated version of the proposed amendments to the Quad Cities Technical Specifications. The license amendment request (LAR) letter submitted on July 13, 2013 proposes the addition of TS 4.3.1.1.c, "The combination of U-235 enrichment and gadolinia loading shall be limited to ensure fuel assemblies have a maximum k-infinity of 0.9131 as determined at 4°C (39.2°F) in the normal spent fuel pool in-rack configuration…" The k-infinity value of 0.9131 is from an earlier version of the criticality analysis that used a "super-lattice." Since the "super-lattice" has been withdrawn, please update TS 4.3.1.1.c to use the limiting k-infinity value from the most recent version of the criticality analysis (0.8991) or provide a rationale for use of the 0.9131 value.

Response

An updated markup of Technical Specifications Section 4.3.1.1 is provided in Attachment 3.

NRC Request 5

In the response to RAI 1-11, part b, there is a statement that any future reconstitutions will be explicitly modeled to "confirm they are bounded by the HI-2125245 analysis and will be processed under 50.59." However, no methodology is given in HI-2125245 for modeling reconstitutions or dealing with any biases or uncertainties specific to reconstituted fuel. As

such, modeling of reconstituted fuel would meet the criteria of 10 CFR 50.59(c)(2)(viii) requiring a request for a license amendment pursuant to 10 CFR 50.90. If the licensee intends to use the 50.59 process to qualify future reconstituted fuel, please provide a description of the methodology that will be used to model reconstituted fuel, including any new assumptions, biases, or uncertainties.

Response

EGC plans to evaluate any future reconstituted fuel assemblies under the 10 CFR 50.59 process. 10 CFR 50.59 establishes the conditions under which licensees may make changes to the facility without prior NRC approval. EGC's 50.59 program implements the guidance provided in NEI 96-07, Revision 1, "Guidelines for 10 CFR 50.59 Implementation," which was endorsed by the NRC in Regulatory Guide 1.187 without exception. The objectives of 10 CFR 50.59 are to ensure that licensees (1) evaluate proposed changes to their facilities for their effects on the licensing basis of the plant, as described in the FSAR, and (2) obtain prior NRC approval for changes that meet specified criteria as having a potential impact upon the basis for issuance of the operating license. The reconstituted assembly will be evaluated to determine whether the reactivity of the reconstituted assembly is bounded by the reactivity of the limiting lattice from HI-2125245. If HI-2125245 is bounding, then the evaluation will be processed under 10 CFR 50.59. Typically, the changes made to reconstitute an assembly involve changes to input parameters in the criticality analysis. Therefore, EGC anticipates that the 10 CFR 50.59 review would determine a license amendment is not required. If HI-2125245 is not bounding, then in accordance with 10 CFR 50.59, a license amendment would be pursued.

References

1. Letter from D. M. Gullott (Exelon Generation Company, LLC) to U.S. NRC, "License Amendment Request – Use of Neutron Absorbing Inserts in Units 1 and 2 Spent Fuel Pool Storage Racks," dated July 16, 2013

ATTACHMENT 3

Updated Markup of Technical Specifications Page

4.0 DESIGN FEATURES (continued)

4.3 Fuel Storage

4.3.1 Criticality

4.3.1.1 The spent fuel storage racks are designed and shall be maintained with:

a. $k_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.1.2 of the UFSAR; ~~and~~

b. A nominal 6.22 inch center to center distance between fuel assemblies placed in the storage racks~~.~~ ;

4.3.2 Drainage

The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 666 ft 8.5 inches.

4.3.3 Capacity

The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 3657 fuel assemblies for Unit 1 and 3897 fuel assemblies for Unit 2.

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c. The combination of U-235 enrichment and gadolinia loading shall be limited to ensure fuel assemblies have a maximum k-infinity of 0.8991 as determined at 4°C (39.2°F) in the normal spent fuel pool in-rack configuration; and

d. The installed neutron absorbing rack inserts having a Boron-10 areal density ≥ 0.0116 g/cm^2.

ATTACHMENT 4

Holtec International Affidavit

U.S. Nuclear Regulatory Commission
Document ID 2127007
Non-Proprietary Enclosure 1

AFFIDAVIT PURSUANT TO 10 CFR 2.390

I, Debabrata (Debu) Mitra-Majumdar, 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 information provided in the following reports.

a. RRTI-2127-002R0, "Response to Request for Additional Information", Quad Cities, RAI (proprietary information).

These reports 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, 4.b and 4.e, 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

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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.

AFFIDAVIT PURSUANT TO 10 CFR 2.390

(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)

Debabrata (Debu) Mitra-Majumdar, 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 her knowledge, information, and belief.

Executed at Marlton, New Jersey, this 4th day of August, 2014.

Debabrata (Debu) Mitra-Majumdar, Ph.D.
Holtec International

Subscribed and sworn before me this 4th day of August, 2014.

Maria C. Massi

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

ATTACHMENT 5

Holtec International Document RRTI-2127-002R0,
"Attachment B (NON-PROPRIETARY VERSION) Holtec Responses to Request for Additional Information for Quad Cities Criticality Insert Analysis"
(Non-Proprietary Version)

NRC Request 3

RAI 1-17 requested justification for the use of a code that had not yet been submitted for review by the NRC for reload analysis methods with the SVEA-96 Optima2 fuel assembly, in order to obtain isotopic data for use in the criticality analyses. No specific information was provided to allow NRC staff to determine if CASMO-4 isotopic composition predictions are acceptable for SVEA-96 type lattices. NRC staff agrees that for the most part, the SVEA-96 lattice is comparable to other fuel lattices already approved for use with CASMO-4 in the U.S. However, the water wings are a relatively unique feature, and the SVEA-96 calculation results show a much larger bias between CASMO-4 and MCNP than the GE14 calculations. Appendix C shows the difference between CASMO-4 and MCNP5 calculations to be less than two sigma for the GE14 fuel design, while comparison of Tables 7.1(a) and 7.2(a) shows that the difference can approach the 20-sigma threshold for the SVEA-96 fuel design. This suggests that the heterogeneities of the SVEA-96 Optima2 fuel lattice may require special modeling considerations or treatment that is substantially different from that of other fuel assembly designs. Please provide evidence that the CASMO-4 code would be expected to compute isotopic quantities comparable to codes previously approved by the NRC for use in reload analysis of SVEA-96 Optima2 fuel.

Response:

Response proprietary.