Florida Power & Light Company, 6501 South Ocean Drive, Jensen Beach, FL 34957

May 4, 2012

Proprietary Information – Withhold From Public Disclosure Under 10 CFR 2.390. The balance of this letter may be considered non-proprietary upon removal of Attachment 2.

L-2012-182
10 CFR 50.90
10 CFR 2.390

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

Re: St. Lucie Plant Unit 2
Docket No. 50-389
Renewed Facility Operating License No. NPF-16

Response to NRC Reactor Systems Branch Request for Additional Information Regarding Extended Power Uprate License Amendment Request

References:

(1) R. L. Anderson (FPL) to U.S. Nuclear Regulatory Commission (L-2011-021), "License Amendment Request for Extended Power Uprate," February 25, 2011, Accession No. ML110730116.

(2) R. L. Anderson (FPL) to U.S. Nuclear Regulatory Commission (L-2011-466), "Revision to Extended Power Uprate License Amendment Request Proposed Technical Specification 5.6, Design Features – Fuel Storage – Criticality ," November 4, 2011, Accession No. ML11314A111.

(3) Email from T. Orf (NRC) to L. Abbott (FPL). Subject: "St. Lucie 2 EPU RAIs – Reactor Systems (SRXB) re: spent fuel criticality," April 16, 2012.

(4) Email from T. Orf (NRC) to L. Abbott (FPL). Subject: "St. Lucie 2 EPU RAIs – Reactor Systems (SRXB) re: spent fuel criticality," April 17, 2012.

By letter L-2011-021 dated February 25, 2011 [Reference 1], Florida Power & Light Company (FPL) requested to amend Renewed Facility Operating License No. NPF-16 and revise the St. Lucie Unit 2 Technical Specifications (TS). The proposed amendment will increase the unit's licensed core thermal power level from 2700 megawatts thermal (MWt) to 3020 MWt and revise the Renewed Facility Operating License and TS to support operation at this increased core thermal power level. This represents an approximate increase of 11.85% and is therefore considered an Extended Power Uprate (EPU).

A001
NRR

By letter L-2011-466 [Reference 2], FPL revised the EPU license amendment request (LAR) proposed changes to TS Section 5.6 regarding spent fuel pool storage requirements. In emails dated April 16 and 17, 2012 from NRC (T. Orf) to FPL (L. Abbott) [References 3 and 4, respectively], NRC staff requested additional information regarding FPL's LAR to implement the EPU. The emails consisted of 30 requests for additional information (RAIs) from the NRC Reactor Systems Branch (SRXB). Responses to 21 of the RAIs are provided in the attachments to this letter. Responses to the remaining RAIs will be submitted in a separate transmittal. In addition, to support the responses to the RAIs, a change to the EPU LAR proposed changes to Technical Specification 5.6, Fuel Storage, regarding spent fuel pool criticality requirements is being submitted in a separate transmittal.

Attachment 1 contains the non-proprietary responses to RAI questions SRXB-120, -122, -123, -127, -128, -144, -147, and -148. Attachment 2 contains the Holtec, Inc. (Holtec) proprietary responses to RAI questions SRXB-120, -123, -124, -125, -126, -129, -130, -132, -134, -135, -136, -140, -142, -143 and -146. Note that SRXB-120 and SRXB-123 contain both proprietary and non-proprietary information.

Attachment 3 contains a copy of the Proprietary Information Affidavit. The purpose of this attachment is to withhold the proprietary information contained in the responses provided in Attachment 2 from public disclosure. The Affidavit, signed by Holtec as the owner of the information, sets forth the basis for which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of § 2.390 of the Commission's regulations. Accordingly, it is respectfully requested that the information which is proprietary to Holtec be withheld from public disclosure in accordance with 10 CFR 2.390.

This submittal does not alter the significant hazards consideration or environmental assessment previously submitted by FPL letter L-2011-021 [Reference 1].

This submittal contains no new commitments and no revisions to existing commitments.

In accordance with 10 CFR 50.91(b)(1), a copy of this letter is being forwarded to the designated State of Florida official.

Should you have any questions regarding this submittal, please contact Mr. Christopher Wasik, St. Lucie Extended Power Uprate LAR Project Manager, at 772-467-7138.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed on 04-May-2012

Very truly yours,

Richard L. Anderson
Site Vice President
St. Lucie Plant

Attachments (3)

cc: Mr. William Passetti, Florida Department of Health

Response to Request for Additional Information

The following information is provided by Florida Power & Light (FPL) in response to the U.S. Nuclear Regulatory Commission's (NRC) Request for Additional Information (RAI). This information was requested to support the Extended Power Uprate (EPU) License Amendment Request (LAR) for St. Lucie Nuclear Plant Unit 2 that was submitted to the NRC by FPL via letter L-2011-021 dated February 25, 2011, Accession No. ML110730116.

By letter L-2011-466, dated November 4, 2011, Accession No. ML11314A111, FPL revised the proposed changes to TS Section 5.6 related to spent fuel pool criticality. In an email dated April 16, 2012, the NRC staff requested additional information regarding FPL's license amendment request (LAR) to implement the EPU. The email consisted of 28 requests for additional information (RAIs) from the NRC Reactor Systems Branch (SRXB). In an email dated April 17, 2012, the NRC staff provided two additional RAIs related to spent fuel pool criticality. The non-proprietary responses are provided below. The Holtec, Inc. proprietary responses are provided in Attachment 2.

SXRB-120

As described in Section 1, multiple "cases" may be used to store fuel within each of the three regions (i.e., CPR, Region 1, and Region 2). Subregions within each region may be as small as four assemblies.

Section 2.6.1 on interfaces between different cases within one rack notes that "all overlapping patterns meet one of the analyzed cases". This text may not apply to the assemblies within a subregion (i.e. case 6 or Region 2 pattern F).

a) The proposed technical specifications (TS) include the following language:

> ***The storage arrangements of fuel within a rack module may contain more than one pattern. There are no interface limitations within Region 1 between rack modules or within racks; however, each assembly must meet the burnup requirements of each 2x2 array that it resides within.***

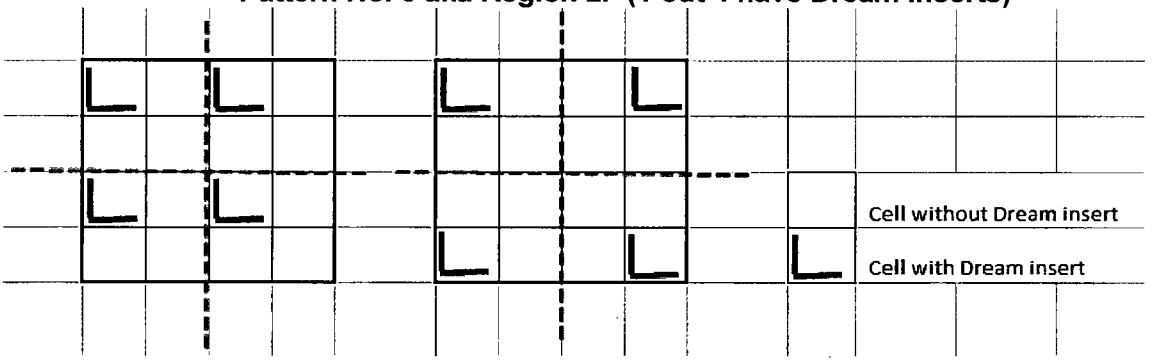
Depending on how "each 2x2 array that it resides within" is interpreted, the proposed TS may not clearly implement the language from Section 2.6.1 of the analysis. Section 2.6.1 says all overlapping patterns must meet one of the analyzed cases, while the TS could be interpreted as not applying to overlapping 2x2 arrays. Each storage cell is part of up to four 2x2 arrays. Each storage cell must simultaneously meet the requirements of all arrays of which it is a part. The current TS could be interpreted as it would only have to meet one. Provide a revised TS that ensures each storage cell must simultaneously meet the requirements of all arrays of which it is a part.

b) The analysis modeled all of the 2x2 arrays with periodic boundary conditions. This creates a repeating set of 2x2 arrays. The proposed TS state, "Diagram is for illustration only." This indicates the adjacent 2x2 array may actually be different, even though it would meet the definition for the same pattern.

In the proposed TS, case 6 is Pattern "F" shown in Figure 5.6-2 and defined by definition No. 3. The TS definition states that there must be at least one Metamic insert placed anywhere within the 2x2 array.

Based on the TS definitions and figures, it would appear acceptable to have a 4x4 array with Metamic inserts on the 4 corners of the 4x4 array. As shown in the figure below, this would leave a central 2x4 array that does not have an insert. Has such a configuration been evaluated?

Pattern No. 6 aka Region 2F (1 out 4 have Dream inserts)



There may be a disconnect between the analysis and the proposed TS which does not appear to require that overlapping sets of 4 assemblies using the same case (i.e., case 6) meet the subregion requirements.

Is it required that any and all, including overlapping, 2x2 assembly sets within a subregion (i.e., case 6) must meet the definition for that subregion? If not, describe how the criticality analysis supports the proposed TS with regard to arrangement variations within a subregion (i.e., area filled with same pattern definition).

Response

a. The EPU LAR proposed changes to Technical Specifications are being revised to address this RAI and are being submitted under separate correspondence.

b. See Attachment 2 response to RAI SRXB-120 b.

SRXB-122

Section 2.3.1 of report HI-2104753 states that only one fuel assembly type has been used at St. Lucie Unit 2. A review of the RW-859(2002) data shows that the uranium loading has varied from 361 to 394 kgU per assembly for fuel permanently discharged by the end of 2002. This information indicates changes to the fuel assembly design, despite it being considered the same fuel assembly 'type'. Describe the design changes that have occurred over the St Lucie U2 operating history. Demonstrate that the fuel assembly modeled in HI-2104753 bounds all variations.

a. Describe how fuel assembly design changes will be controlled in the future to ensure the nuclear criticality safety analysis remains bounding.

Response

The uranium loading of the fuel assemblies has not changed since 2002. The changes identified for fuel assemblies discharged by the end of Year 2002 were mainly due to the use of

B_4C rods in place of the UO_2 rods in early cycles' fuel (prior to Year 1995) and the increase in pellet diameter and guardian grid design implemented in Cycle 11 (Year 1998) with some minor change to stack position (~1 in). There were no other changes which impacted the uranium loading of the fuel assemblies. The axial fuel stack height has always been 136.7 inches. The criticality analysis has used the fuel parameters corresponding to the higher uranium loading fuel which would bound the earlier lower uranium loading fuel.

Fuel assembly design changes are controlled and evaluated as part of reload process to ensure that the criticality analysis remains bounding.

SRXB-123

Section 2.3.1 of report HI-2104753 states that only two sets of operating conditions are evaluated. The plant has previously been uprated, so at least three sets of operating conditions have been used. Demonstrate that the most conservative operating parameters have been used, or provide justification for not including the most limiting conditions.

Concerning Tables 7.1 and 7.2, the comparison of the effect of Pre-EPU and EPU core operating conditions on k_{eff} should have included comparisons at lower initial enrichments consistent with the applicable loading curves. Provide results for similar calculations performed at lower initial enrichments that are consistent with the applicable loading curves.

Response

St. Lucie Unit 2 operated at a reduced power of 2560 megawatts thermal (MWth) only in the first cycle of operation and was uprated to the current pre-EPU power of 2700 MWth beginning in Cycle 2. As such, the limiting operating conditions seen by the first cycle fuel, before being discharged into the spent fuel pool after two or three cycles of operation, correspond to the current pre-EPU power of 2700 MWth. For the criticality analysis, bounding values have been used for all the parameters as listed in Table 5.1 of the report HI-2104753, "St. Lucie Unit 2 Criticality Analysis for EPU and Non-EPU Fuel", for the pre-EPU and EPU fuel.

See Attachment 2 response to RAI SRXB-123 for the response to the second paragraph of the question.

SRXB-127

Section 2.3.5.3.3 of report HI-2104753 states that St Lucie Unit 2 always operates at all rods out during full power operation. Discussions with experienced operators indicate that it is likely that some partly rodded operations have occurred at power. Please provide justification for not considering the effects of rodded operation during depletion. Include in the justification the fraction of core burnup that is accumulated with rods partly or fully inserted.

Response

St. Lucie Unit 2 periodically adjusts the parking locations of all the control element assemblies (CEAs) to prevent fretting wear on both the CEAs and the guide tube sleeve. The current four step CEA repositioning guideline parks the CEAs approximately ¼ of each cycle time (~3000 EFPH) at each of the four positions of 133", 134", 135" and 136" withdrawn. Based on

this repositioning guideline, the CEAs are completely above the active fuel region except when the CEAs are at 133" withdrawn when there is a small overlap of approximately 0.4 inches with the six inch top blanket region.

During full power operations, the above guideline is followed and CEAs are positioned as described. Lead bank CEAs may be partially inserted during power maneuvers and off-normal operation for reactivity control, but those are not common occurrences during the cycle. There are 12 lead bank CEAs in the St. Lucie Unit 2 core, therefore only 12 assemblies are impacted during each cycle. Since assemblies are in the core typically for three cycles, the time spent by any particular assembly with a partially inserted CEA is a small fraction of the total residence time of that assembly in the core. Operational data was reviewed for the last two cycles, and it was noted that the lead bank control rods were partially inserted less than 10 times per cycle, for short periods of time (less than 1 EFPD most times).

NUREG/CR-6759, "Parametric Study of the Effect of Control Rods for PWR Burnup Credit," February 2002, documents a study of the impact of control rod insertion on reactivity. The document notes the following conclusions:

> "These more realistic calculations show that even for significant burnup exposures, minor axial CR insertions (e.g., <20 cm) result in a very small effect on the *keff* of a burnup credit cask. Consequently, it is concluded that, based on the assumption that U.S. PWRs do not use CRs to a significant extent (i.e., CRs are not inserted deeper than the top ~20 cm of the active fuel and CRs are not inserted for extended burnups), the effect of CRs on discharge reactivity is relatively small (less than 0.2% Δk)."

The documented impact in NUREG/CR-6759 is small compared to the margin to the regulatory requirement included in the St. Lucie 2 spent fuel pool criticality analysis.

SRXB-128

The St Lucie Unit 2 UFSAR provides an uncertainty of 2.5% in the uncertainty in recorded burnup. Please provide the basis for this value, and if necessary defend its application to a spent fuel pool criticality safety analysis (see Section 2.3.7.1).

Additionally, a review of the assembly burnup data contained in the RW-859(2002) database shows that a significant fraction of the burnup record data in the database was region average data, as indicated by identical burnup values for multiple assemblies. For example, the database shows that 37 assemblies with assembly IDs between L2G037 and L2G080 (discharged in 1994) each had exactly 45,000 MWd/MTU burnup values. Confirm that all assembly burnup values have been reevaluated to yield appropriate assembly-specific burnup values consistent with the claimed 2.5% uncertainty. If group average assembly burnups are used, address the impact on the uncertainty in the burnup values used to determine acceptable loading arrangements.

Response

The value of 2.5% for the burnup uncertainty is a value applicable to St. Lucie Unit 2 and covers the plant secondary calorimetric power uncertainty, which is about 1.5%, with an additional 1% allowance.

The burnup values used for assemblies in determining acceptable location in the spent fuel pool are individual assembly-specific burnup values and not based on the region average burnup.

The 2.5% burnup uncertainty is covered in the criticality analysis as specified in the report HI-2104753.

SRXB-144

Concerning Tables 7.57, 7.58 and 7.59, provide a description of what is included in the information listed in these tables under "Unc" and describe how it was derived. Does this value include biases?

Response

See the response in Attachment 2 for RAI SRXB-126.

SRXB-147

There does not appear to be any indication that the boron dilution accident timing results have been reviewed to ensure that boron dilution challenging the boron concentration required for the criticality analysis is sufficiently unlikely. Describe how the boron dilution accident is affected by the proposed change.

Response

The boron dilution analysis described in the UFSAR has been reviewed and determined to remain applicable for the EPU for the following reasons:

- The initial boron concentration in the spent fuel pool of 1720 ppm used in the UFSAR analysis is increasing to 1900 ppm for the EPU based on the proposed changes to the Technical Specifications.
- The minimum boron concentration required to maintain K_{eff} to ≤ 0.95 is decreasing for EPU from 520 ppm to 500 ppm.
- The dilution timing for EPU from 1900 ppm to 500 ppm provides margin to the UFSAR timing results for dilution from 1720 ppm to 520 ppm.
- The spent fuel pool water volume used in the UFSAR analysis remains bounding for EPU conditions with the considerations of Metamic™ inserts.

SRXB-148

Many of the allowable storage pattern "DEFINITIONS" provided in the proposed TS include language like the following:

Allowable pattern is Fresh Fuel or fuel of lower reactivity . . .

How is the "fuel of lower reactivity" determination made and using what criteria?

Response

The proposed EPU LAR changes to Technical Specifications are being revised to address this RAI and are being submitted under separate correspondence.

ATTACHMENT 3

**Response to NRC Reactor Systems Branch
and Nuclear Performance Branch
Request for Additional Information Regarding
Extended Power Uprate License Amendment Request**

**Holtec Inc.
Affidavit for Withhold Proprietary Information
from Public Disclosure**

This coversheet plus 5 pages

HOLTEC INTERNATIONAL

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Holtec International Document ID 1867-AFFI-05R1

AFFIDAVIT PURSUANT TO 10 CFR 2.390

I, Evrim K. Kalfazade, 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 with Holtec letter 1867009, specifically Holtec RRTI-1867-004, which contains Holtec Proprietary information and is appropriately marked as such. The following RAIs and RAI responses are considered proprietary: SRXB-120, SRXB-123, SRXB-124, SRXB-125, SRXB-126, SRXB-129, SRXB-130, SRXB-132, SRXB-134, SRXB-135, SRXB-136, SRXB-140, SRXB-142, SRXB-143, and SRXB-146.

(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).

(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 paragraph 4.b, above.

(5) The information sought to be withheld is being submitted to the NRC in confidence. The information (including that compiled from many sources) is of a sort customarily held in confidence by Holtec International, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by Holtec International. No public disclosure has been made, and it is not available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as

proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within Holtec International is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his designee), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside Holtec International are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information classified as proprietary was developed and compiled by Holtec International at a significant cost to Holtec International. This information is classified as proprietary because it contains detailed descriptions of analytical approaches and methodologies not available elsewhere. This information would provide other parties, including competitors, with information from Holtec International's technical database and the results of evaluations performed by Holtec International. A substantial effort has been expended by Holtec International to develop this information. Release of this information would improve a competitor's position because it would enable Holtec's competitor to copy our technology and offer it for sale in competition with our company, causing us financial injury.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to Holtec International's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of 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.

AFFIDAVIT PURSUANT TO 10 CFR 2.390

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

Mr. Evrim K. Kalfazade, 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 19th day of April, 2012.

Evrim Kalfazade

Evrim K. Kalfazade
Holtec International

Subscribed and sworn before me this 19th day of April, 2012.

Maria C. Massi

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