Florida Power & Light, 9760 S.W. 344 St. Homestead, FL 33035

FPL

JUL 07 2011
L-2011-226
10 CFR 50.90
10 CFR 2.390

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555-0001

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Response to NRC Request for Additional Information Regarding
Extended Power Uprate License Amendment Request No. 205 and
Nuclear Performance and Code Review (SNPB) Issues

References:

(1) M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2010-113), "License Amendment Request for Extended Power Uprate (LAR-205)," (TAC Nos. ME4907 and ME4908), Accession No. ML103560169, October 21, 2010.

(2) Email from J. Paige (NRC) to T. Abbatiello (FPL), "Turkey Point EPU - Nuclear Performance and Code Review (SNPB) Request for Additional Information - Round 1," Accession No. ML111020120, April 11, 2011.

(3) M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2011-100), "Response to NRC Request for Additional Information Regarding Extended Power Uprate License Amendment Request No. 205 and Nuclear Performance and Code Review Issues," Accession No. ML11139A344, May 18, 2011.

(4) Email from J. Paige (NRC) to S. Hale (FPL), "Turkey Point EPU - Nuclear Performance and Code Review (SNPB) Request for Additional Information - Round 2," Accession No. ML11164A053, June 10, 2011.

By letter L-2010-113 dated October 21, 2010 [Reference 1], Florida Power and Light Company (FPL) requested to amend Renewed Facility Operating Licenses DPR-31 and DPR-41 and revise Turkey Point Units 3 and 4 Technical Specifications (TS). The proposed amendment will increase each unit's licensed core power level from 2300 megawatts thermal (MWt) to 2644 MWt and revise the Renewed Facility Operating Licenses and TS to support operation at this increased core thermal power level. This represents an approximate increase of 15% and is therefore considered an extended power uprate (EPU).

On April 11, 2011, FPL received a Request for Additional Information (RAI) via email from the NRC Project Manager (PM) [Reference 2] containing seven questions from the Nuclear Performance and Code Review Branch (SNPB). FPL responded to the RAI via letter L-2011-100 [Reference 3] on May 18, 2011.

By email from the NRC PM dated June 10, 2011 [Reference 4], additional information was requested by the NRC SNPB staff pertaining to FPL's RAI response in Reference 3. This follow-up RAI consisted of two (2) questions regarding applicable nuclear cross-section library data and code benchmarking against experimental data. The two RAI questions and the applicable FPL responses are documented in Attachment 1 (non-proprietary) and Attachment 2 (proprietary) to this letter.

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NRR

Attachment 3 contains the application for withholding the proprietary information contained in Attachment 2 from public disclosure. As Attachment 2 contains information proprietary to Westinghouse Electric Company, LLC (Westinghouse), it is supported by an affidavit signed by Westinghouse, the owner of the information. The affidavit 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 Westinghouse be withheld from public disclosure in accordance with 10 CFR 2.390 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of items in the response to the RAI question in Attachment 2 of this letter or the supporting Westinghouse affidavit should reference CAW-11-3202 and should be addressed to J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, Suite 428, 1000 Westinghouse Drive, Cranberry Township, PA 16066.

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

This submittal does not alter the significant hazards consideration or environmental assessment previously submitted by FPL letter L-2010-113 [Reference 1].

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

Should you have any questions regarding this submittal, please contact Mr. Robert J. Tomonto, Licensing Manager, at (305) 246-7327.

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

Executed on July 7, 2011.

Very truly yours,

Eric McCartney for M. Kiley

Michael Kiley
Site Vice President
Turkey Point Nuclear Plant

Attachments (3)

cc: USNRC Regional Administrator, Region II
USNRC Project Manager, Turkey Point Nuclear Plant
USNRC Resident Inspector, Turkey Point Nuclear Plant
Mr. W. A. Passetti, Florida Department of Health (without Attachment 2)

Turkey Point Units 3 and 4

RESPONSE TO NRC RAI REGARDING EPU LAR NO. 205
AND SNPB NUCLEAR PERFORMANCE AND CODE REVIEW ISSUES

ATTACHMENT 1

NON-PROPRIETARY RESPONSE

Response to Request for Additional Information

The following information is provided by Florida Power and Light Company (FPL) in response to the U. S. Nuclear Regulatory Commission's (NRC) Request for Additional Information (RAI). This information was requested to support License Amendment Request (LAR) 205, Extended Power Uprate (EPU), for Turkey Point Nuclear Plant (PTN) Units 3 and 4 that was submitted to the NRC by FPL via letter (L-2010-113) dated October 21, 2010 [Reference 1].

By email from the NRC Project Manager (PM) dated June 10, 2011 [Reference 2], additional information regarding nuclear performance and computer code issues was requested by the NRC staff in the Nuclear Performance and Code Review Branch (SNPB) to support the review of the EPU LAR [Reference 1]. The RAI consisted of two (2) questions regarding applicable nuclear cross-section library data and the extent of code benchmarking against experimental data. The RAI questions and FPL responses are documented below.

This attachment presents the non-proprietary version of the RAI response. The RAI response containing information proprietary to Westinghouse Electric Company LLC (Westinghouse) is provided in Attachment 2. Attachment 3 contains the affidavit signed by Westinghouse, as the owner of the information, which sets forth the basis for withholding the information from public disclosure by the Commission and address with specificity the considerations listed in paragraph (b)(4) of § 2.390 of the Commission's regulations.

SNPB-2.1 **The response to RAI SNPB-1.1 indicated that the nuclear design code package used in the analysis relies on the ENDF/B-VI cross section library from the early 1990s rather than the current ENDF/B-VII library that was updated 2006. Provide justification that the use of the ENDF/B-VI library cross section data provides sufficiently accurate results (e.g., through comparison to results generated from current cross section data).**

A paper was written for PHYSOR-2010 by Westinghouse [Reference 3] which concluded that the differences in results between the ENDF/B-VI-based library that Westinghouse currently uses and an ENDF/B-VII-based library were minimal for UO_2 cores (although significant for MOX fuel). Although the work in this paper was done using the PARAGON code, the conclusions would have been the same if the work had been performed with PHOENIX-P.

SNPB-2.2 **The response to RAI SNPB-1.1 discussed experimental benchmarking of the PHOENIX-P/ANC code package, referencing benchmarking discussed in WCAP-11596-P-A and stating that similar benchmarking was performed in 1997 to support implementation of the ENDF/B-VI cross section library data. However, it appeared that the experimental data referenced in WCAP-11596-P-A did not encompass fuel enrichments up to 5 wt%; furthermore, details of the 1997 benchmarking effort were not discussed in the RAI response. Therefore, provide a comprehensive summary of the experimental and computational efforts to benchmark the PHOENIX-P/ANC code package for performing analysis with uranium oxide fuel enriched to 5 wt% (or greater) uranium-235. If experimental benchmarking at approximately 5 wt% enrichment has not been performed, identify the upper enrichment limits that have been benchmarked and provide alternate justification that the PHOENIX-P/ANC code package provides sufficiently accurate results at 5 wt%.**

Summary:

A detailed summary of the benchmarking of PHOENIX-P/ANC with the ENDF/B-VI library is found in Reference 4. As described in the paper, the benchmarking included analyzing various critical experiments, PWR assembly benchmarks, and comparing measured to predicted plant cycle information. Plant data for enrichments up to [ ]^{a,c} wt% was utilized to demonstrate the accuracy of the PHOENIX-P/ANC code system when utilizing the ENDF/B-VI library. In addition, the comparison to critical experiments shows no reactivity trend over the experimental enrichment range ([ ]^{a,c} wt%). It can therefore be concluded that the combination of experimental benchmarks along with plant data has demonstrated the validity of PHOENIX-P/ANC with the ENDF/B-VI library for applications up to 5 wt%.

Detailed Discussion:

Over 25 cycles of updated plant operation were benchmarked as part of the effort discussed in Reference 4 in addition to re-calculating the experimental benchmark data previously used in the WCAP-11596-P-A benchmarking effort. The original 1997 benchmarking used for PHOENIX/ANC with the ENDF/B-VI library was based on 13 cycles for measured to predicted data comparisons. The plant cycles analyzed included various plant and lattice types and enrichments up to and including [ ]^{a,c} wt%. Descriptions of those cycles coupled with the measured-to-predicted (M-P) differences for the hot zero power critical boron and isothermal temperature coefficient are provided in Table 2.2-1. It should be noted that additional cycles were subsequently added for the Reference 4 paper. As was concluded in the paper, this benchmarking showed that the accuracy of PHOENIX-P/ANC with the ENDF/B-VI library was as good as or better than that calculated for the corresponding cycles using PHOENIX-P/ANC with the ENDF/B-V library described in WCAP-11596-P-A.

The PHOENIX-P/ANC nuclear design system utilizing the ENDF/B-VI library has been in continuous use since 1997 and is the primary nuclear design system

used by Westinghouse and its licensees. The system continues to provide excellent accuracy relative to plant data: e.g., with over 200 cycles designed and operated using the PHOENIX-P/ANC nuclear design system with the ENDF/B-VI library, the statistics on the measured to predicted startup hot zero power boron concentration show a mean of less than [ ]^{a,c}. This performance is better than that documented in WCAP-11596-P-A and demonstrates that the system continues to have essentially no reactivity bias and consistent reliable performance for current core designs.

PHOENIX-P/ANC is based on robust first principle physics models which have been demonstrated in Figure 3.2 of WCAP-11596-P-A to be independent of fuel enrichment. This graph is repeated for PHOENIX-P with the ENDF/B-VI library in Figure 2.2-1. Both of these graphs show that reactivity, characterized on the graphs by k_{eff}, is independent of enrichment over the wide range of enrichments covered in the graphs. Since these physics models are not enrichment dependent, this trend can be expected to continue for higher enrichments including up to 5 wt%. Therefore, there will be no degradation in accuracy for 5 wt% enriched fuel compared to the [ ]^{a,c} wt% fuel that has been benchmarked in plant cycles above. Further evidence that PHOENIX-P/ANC results are not enrichment dependent can be found in Table 2.2-2 below which shows differences between measured and PHOENIX-P/ANC predicted HZP critical boron concentration values for 10 cycles of sister units plotted against the highest enrichment feed for each cycle, ranging from [ ]^{a,c} wt% for these cycles. All differences are within about one standard deviation for this parameter [ ]^{a,c}, demonstrating very good performance over this enrichment range. Indeed, the variation in these differences is consistent with cycle to cycle variations historically seen for HZP startup critical boron concentration measured to predicted differences regardless of feed enrichment.

References

1. M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2010-113), "License Amendment Request No. 205: Extended Power Uprate (EPU)," (TAC Nos. ME4907 and ME4908), Accession No. ML103560169, October 21, 2010.
2. Email from J. Paige (NRC) to S. Hale (FPL), "Turkey Point EPU - Nuclear Performance and Code Review (SNPB) Request for Additional Information - Round 2," Accession No. ML11164A053, June 10, 2011.
3. Huria, H.C., et al, "ENDF/B-VII Based Library for PARAGON", PHYSOR-2010 – Advances in Reactor Physics to Power the Nuclear Renaissance, Pittsburgh, PA.USA, May 9 - 14, 2010.
4. Huria, H.C., et al, "Evaluation of the ENDF/B-VI based New Multigroup Library for the WH Core Analysis Code System, International Conference on the Physics of Nuclear Science and Technology, Long Island, NY, October 5-8, 1998.

Table 2.2-1: Plant cycles included in 1997 benchmark

[

Plant	Plant type	Lattice	Cycle	Feed Enrich	HZP Boron** (M-P)	HZP ITC** M-P

]a,c

*Boron differences in ppm
**Isothermal Temperature differences in pcm/°F

Table 2.2-2: HZP boron concentration differences as a function of feed enrichment

Startup HZP Boron measurement	
Feed Enrich	M-P (ppm)

a,c

Figure 2.2-1: K_{eff} as a function of enrichment: PHOENIX-P with ENDF/B-VI library

a,c

Turkey Point Units 3 and 4

RESPONSE TO NRC RAI REGARDING EPU LAR NO. 205
AND SNPB NUCLEAR PERFORMANCE AND CODE REVIEW ISSUES

ATTACHMENT 3

WESTINGHOUSE AFFIDAVIT CAW-11-3202 FOR ATTACHMENT 2

This coversheet plus 8 pages

Westinghouse Electric Company
Nuclear Services
1000 Westinghouse Drive
Cranberry Township, Pennsylvania 16066
USA

U.S. Nuclear Regulatory Commission
Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Direct tel: (412) 374-4643
Direct fax: (724) 720-0754
e-mail: greshaja@westinghouse.com
Proj letter: FPL-11-158

CAW-11-3202

July 6, 2011

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: FPL-11-158 P-Attachment, "Turkey Point Units 3 and 4 – Response to NRC Request for Additional Information (RAI) from the Nuclear Performance and Code Review Branch (SNPB) Related to Extended Power Uprate (EPU) License Amendment Request (LAR) No. 205 (TAC Nos. ME 4907 and ME 4908)" (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-11-3202 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by Florida Power and Light.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-11-3202, and should be addressed to J. A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company LLC, Suite 428, 1000 Westinghouse Drive, Cranberry Township, Pennsylvania 16066.

Very truly yours,

J. A. Gresham, Manager
Regulatory Compliance

Enclosures

CAW-11-3202

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

Before me, the undersigned authority, personally appeared J. A. Gresham, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

J. A. Gresham, Manager
Regulatory Compliance

Sworn to and subscribed before me
this 6th day of July 2011

Renee' Giampole
Notary Public

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Renee Giampole, Notary Public
Penn Township, Westmoreland County
My Commission Expires September 25, 2013

(1) I am Manager, Regulatory Compliance, in Nuclear Services, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of

Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.

(c) Its use 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 a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390; it is to be received in confidence by the Commission.

(iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in FPL-11-158 P-Attachment, "Turkey Point Units 3 and 4 – Response to NRC Request for Additional Information (RAI) from the Nuclear Performance and Code Review Branch (SNPB) Related to Extended Power Uprate (EPU) License Amendment Request (LAR) No. 205 (TAC Nos. ME 4907 and ME 4908)" (Proprietary) for submittal to the Commission, being transmitted by Florida Power and Light letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse for use by Turkey Point Units 3 and 4 is expected to be applicable for other licensee submittals in response to certain NRC requirements for Extended Power Uprate submittals and may be used only for that purpose.

This information is part of that which will enable Westinghouse to:

(a) Provide input to the U.S. Nuclear Regulatory Commission for review of the Turkey Point EPU submittals.

(b) Provide inputs of customer specific calculations.

(c) Provide licensing support for customer submittals.

Further this information has substantial commercial value as follows:

(a) Westinghouse plans to sell the use of the information to its customers for the purpose of meeting NRC requirements for licensing documentation associated with EPU submittals.

(b) Westinghouse can sell support and defense of the technology to its customer in licensing process.

(c) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar information and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

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