



FirstEnergy Nuclear Operating Company

Beaver Valley Power Station
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Shippingport, PA 15077-0004

Lew W. Myers
Senior Vice President

724-682-5234
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September 25, 2001
L-01-120

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

**Subject: Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
Supplemental Information in Support of
License Amendment Request No. 137**

The purpose of this letter is to provide the Westinghouse Class 2 (proprietary) and Class 3 (non-proprietary) versions of technical details specifying the level of credits used in evaluating the Axial Burn-up Bias assessment for the Beaver Valley Unit 2 Criticality Re-rack. This letter is being provided as supplemental information in support of the NRC review of Beaver Valley Unit No. 2 License Amendment Request No. 137, "Credit for Soluble Boron," which was submitted via Letter L-01-044 dated March 28, 2001. This additional information was requested by the NRC in order to support the completion of their review. The appropriate affidavit and necessary attachments are provided. The following three enclosures are also included:

1. Proprietary Information Notice
2. Copyright Notice
3. Westinghouse letter "Application for Withholding Proprietary Information from Public Disclosure" (CAW-01-1481) with Affidavit (CAW-01-1481)

The topical report referred to in the level of credits is WCAP-14416-NP-A, Revision 1, "Westinghouse Spent Fuel Rack Criticality Analysis Methodology," November 1996. This topical report was NRC approved by the referenced SER dated October 25, 1996.

If there are any questions concerning this matter, please contact Mr. Thomas S. Cosgrove, Manager, Regulatory Affairs at 724-682-5203.

Sincerely,

Lew W. Myers

Enclosures

AP01

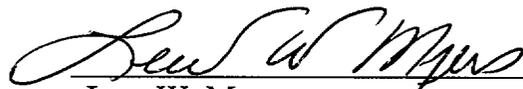
Beaver Valley Power Station, Unit No. 2
Supplemental Information in Support of LAR No. 137
L-01-120
Page 2

c: Mr. L. J. Burkhart, Project Manager
Mr. D. M. Kern, Sr. Resident Inspector
Mr. H. J. Miller, NRC Region I Administrator
Mr. D. A. Allard, Director BRP/DEP
Mr. L. E. Ryan (BRP/DEP)

**Subject: Beaver Valley Power Station, Unit No. 2
BV-2 Docket No. 50-412, License No. NPF-73
Supplemental Information in Support of
License Amendment Request No. 137**

I, Lew W. Myers, being duly sworn, state that I am Senior Vice President of FirstEnergy Nuclear Operating Company (FENOC), that I am authorized to sign and file this submittal with the Nuclear Regulatory Commission on behalf of FENOC, and that the statements made and the matters set forth herein pertaining to FENOC are true and correct to the best of my knowledge and belief.

FirstEnergy Nuclear Operating Company

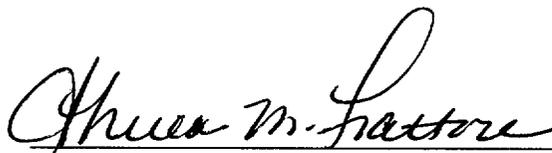


Lew W. Myers
Senior Vice President - FENOC

COMMONWEALTH OF PENNSYLVANIA

COUNTY OF BEAVER

Subscribed and sworn to me, a Notary Public, in and for the County and State above named, this 25 th day of September, 2001.



My Commission Expires:

Notarial Seal Sheila M. Fattore, Notary Public Shippingport Boro, Beaver County My Commission Expires Sept. 30, 2002 Member, Pennsylvania Association of Notaries

Proprietary Information Notice

Transmitted herewith are proprietary and non-proprietary versions of documents furnished to the NRC. In order to conform to the requirements of 10 CFR 2.790 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 2.790(b)(1).

Copyright Notice

The documents transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies for the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.790 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond these necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.



Westinghouse
Electric Company LLC

Box 355
Pittsburgh Pennsylvania 15230-0355

September 11, 2001

CAW-01-1481

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

Attention: J. S. Wermiel, Chief,
Reactor Systems Branch
Division of Systems Safety and Analysis

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject: Supplemental Information in Support of the "Licensing Amendment Report – #137, Credit for Soluble Boron, L-01-044, March 28, 2001," September 11, 2001 (Proprietary)

Dear Mr. Wermiel:

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-01-1481 signed by the owner of the proprietary information, Westinghouse Electric Company LLC, a Delaware limited liability company ("Westinghouse"). 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 2.790 of the Commission's regulations.

Accordingly, this letter authorized the utilization of the accompanying Affidavit by FirstEnergy Nuclear Operating Company.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-01-1481, and should be addressed to the undersigned.

Very truly yours,

Henry A. Sepp, Manager
Regulatory and Licensing Engineering

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

SS

COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared Henry A. Sepp, 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, a Delaware limited liability company ("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:

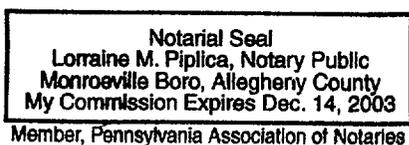


Henry A. Sepp, Manager
Regulatory and Licensing Engineering

Sworn to and subscribed
before me this 11th day
of September, 2001.



Notary Public



- (1) I am Manager, Regulatory and Licensing Engineering, in Nuclear Services of the Westinghouse Electric Company LLC, a Delaware limited liability company ("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 rulemaking proceedings, and am authorized to apply for its withholding on behalf of the Westinghouse Electric Company.
- (2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.790 of the Commission's regulations and in conjunction with the Westinghouse application for withholding accompanying this Affidavit.
- (3) I have personal knowledge of the criteria and procedures utilized by the Westinghouse Electric Company 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 2.790 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 constitute 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 2.790, 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 "Supplemental Information in Support of the 'Licensing Amendment Report -- #137, Credit for Soluble Boron, L-01-044, March 28, 2001,' September 11, 2001 (Proprietary), for information in support of FirstEnergy Nuclear Operating Company submittal to the Commission, transmitted via FirstEnergy Nuclear Operating Company letter and Application for Withholding Proprietary Information from Public Disclosure, H. A. Sepp, Westinghouse, Manager Regulatory and Licensing Engineering to the attention of J. S. Wermiel, Chief, Reactor Systems Branch, Division of Systems Safety and Analysis. The proprietary information was provided by Westinghouse Electric Company.

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

- (a) Provide technical details of the level of credits used in evaluation of the Axial Burnup Bias assessment for the Beaver Valley Unit 2 Criticality Re-rack.
- (b) Assist customers to obtain license changes.

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 technical evaluation justifications 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 for developing the enclosed improved core thermal performance methodology.

Further the deponent sayeth not.

Beaver Valley Unit 2

Spent Fuel Pool Region & Configuration: 2

Axial Burnup Bias Penalty:

Summary of Credits:

- Presence of samarium and fission product buildup credit
- Discrete lattice single rack cell assumption credit
- Boron letdown curve for HFP depletion credit
- Enrichment, density, dishing tolerance credit
- Existing delta to the k_{eff} limit
- Grid and sleeve credit
- Pool leakage credit
- Decay time credit
- WCAP-14416-NP-A axial burnup bias credit

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	1
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	4
	5
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	7
	8
	9
1440	

Net Balance:

Spent Fuel Pool Region & Configuration: N/A, All Cell

Axial Burnup Bias Penalty:

Summary of Credits:

- Presence of samarium and fission product buildup credit
- Discrete lattice single rack cell assumption credit
- Boron letdown curve for HFP depletion credit
- Enrichment, density, dishing tolerance credit
- Existing delta to the k_{eff} limit
- Grid and sleeve credit
- Pool leakage credit
- Decay time credit
- WCAP-14416-NP-A axial burnup bias credit

1469	a, c
	1
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	9
342	

Net Balance:

Spent Fuel Pool Region & Configuration: N/A, 3 of 4

Axial Burnup Bias Penalty:

Summary of Credits:

- Presence of samarium and fission product buildup credit
- Discrete lattice single rack cell assumption credit
- Boron letdown curve for HFP depletion credit
- Enrichment, density, dishing tolerance credit
- Existing delta to the k_{eff} limit
- Grid and sleeve credit
- Pool leakage credit
- Decay time credit
- WCAP-14416-NP-A axial burnup bias credit

268	a, c
	1
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1566	

Net Balance:

Note: All units are $\times 10^5 \Delta K$

Westinghouse Assessment of Credits

The following discussion is provided for utility use in assessing the licensing position of the credits identified (e.g., allowed by the topical, not allowed by the topical, or not discussed in the topical). This assessment is Westinghouse's perspective of the licensing position on the credits. Utilities will have to determine whether they agree with Westinghouse's perspective or establish their own position.

- ¹ On page 4 of the SER, item 9, it states that "no amount of fission product material is modeled in the fuel assembly". This is an input assumption that was noted by the NRC as "... tend to maximize the rack reactivity and are, therefore, appropriately conservative and acceptable". However, it is also noted on page 6 of the SER, sixth paragraph, that the staff does not consider it a requirement to take no credit for fission product poison material in doing the criticality analysis. Therefore, it is appropriate to consider that samarium and fission product buildup credit is acceptable and within the bounds of the WCAP as approved by the NRC.
- ² On page 11 of the SER, item 1, it states that "if axial and planar variations of fuel assembly characteristics are present, they should be explicitly addressed, including the locations of burnable absorber rods". Since the original analysis was done assuming an infinite lattice, which is conservative, it is also acceptable to do discrete modeling of the assembly. Therefore, it is appropriate to consider that discrete lattice single rack cell assumption credit is acceptable and within the bounds of the WCAP as approved by the NRC.
- ³ On page 8 of the topical, Section 4.1, second paragraph, it is noted that "a conservatively high soluble boron letdown curve is chosen to enhance the buildup of plutonium thus making the fuel assembly more reactive when stored in the spent fuel storage racks. The SER only states that appropriate fuel depletion be accounted for in the analysis. Since it was identified that a conservatively high soluble boron letdown curve would be used, then the use of a flat peak boron concentration during the depletion is an excessive conservatism that can be reduced to that allowed in the WCAP. Therefore, it is appropriate to consider that boron letdown curve for HFP depletion credit is acceptable and within the bounds of the WCAP as approved by the NRC.
- ⁴ On pages 3, 4 and 5 of the SER, it is stated that nominal values are to be used with the appropriate tolerances accounted for in the analysis. As noted in the NSAL, the previous analysis has assumed conservative values for these parameters and their tolerances. The rationale for accounting for the more realistic tolerances is also specified in the NSAL. Since the SER identifies allowances for the enrichment, density and dishing fraction tolerances, then accounting for these allowances can be used to obtain a revised uncertainty bias term (B_{uncert}). Therefore, it is appropriate to account for the allowances and the Enrichment, density, dishing tolerance credit is acceptable and within the bounds of the WCAP as approved by the NRC.
- ⁵ The existing delta to the k_{eff} limit is the difference between the k_{eff} limit of 0.95 (for no soluble boron credit) or 1.00 (for soluble boron credit) and the calculated value of k_{eff} determined on a 95/95 basis. This is margin between the analysis results and the limit and does not need to be addressed in the topical report.
- ⁶ On page 4 of the SER, item 7, it states that "no amount of material from spacer grids or spacer sleeves is modeled in the fuel assembly". This is an input assumption that was noted by the NRC as "... tend to maximize the rack reactivity and are, therefore, appropriately conservative and acceptable". It should be noted that the NRC did not state that these assumptions are required. In fact, as noted in item 1 above for the fission product assumption, the NRC later stated in the SER that "the staff does not consider this to be a requirement". Since the NRC did not state that the assumptions are requirements in Section 3.2 of the SER and in one particular case (i.e., the fission products) it was stated that the staff does not consider it a requirement, it could be construed that none of the assumptions listed in Section 3.2 of the SER are requirements. However, it is noted that there is no additional discussions on this assumption. Therefore, from a prudence standpoint, Westinghouse would assume that grid and sleeves should not be modeled as a credit if one is strictly abiding by what is allowed within the topical report.

Westinghouse Non-Proprietary Class 3

- ⁷ On page 11 of the SER, item 3, it states that “the spent fuel storage racks should be assumed to be infinite in lateral extent or surrounded by a water reflector and concrete or structural material as appropriate to the design. The fuel may be assumed to be infinite in the axial dimension, or the effect of reflector on the top and bottom of the fuel may be evaluated.” Since the original analysis was done assuming no pool leakage, which is conservative, it is permissible to consider pool leakage. Therefore, it is appropriate to consider that pool leakage credit is acceptable and within the bounds of the WCAP as approved by the NRC.
- ⁸ Decay time credit is not discussed in the topical report but has been addressed in plant specific submittal. Decay time credit is therefore acceptable. It should be noted that no decay time credit has been used in any of the margin rackups. This credit can be used as an additional margin to demonstrate acceptability and conservatism. Therefore, it is appropriate to consider decay time credit as acceptable based on licensing precedence.
- ⁹ WCAP-14416-NP-A axial burnup bias credit is the amount of axial burnup bias that had been applied to the original analysis. Since the axial burnup bias has been re-calculated, the original bias should be subtracted out so as not to be double accounting for this penalty. Therefore, it is appropriate to consider that WCAP-14416-NP-A axial burnup bias is acceptable.