



FirstEnergy Nuclear Operating Company

Beaver Valley Power Station
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Lew W. Myers
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December 1, 2001
L-01-141

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

**Subject: Beaver Valley Power Station, Unit No. 1
BV-1 Docket No. 50-334, License No. DPR-66
Response to a Request for Additional Information
In Support of LAR No. 292**

This letter provides the FirstEnergy Nuclear Operating Company (FENOC) response to a NRC Request for Additional Information (RAI) in support of License Amendment Request (LAR) 292. The LAR was submitted by FENOC letter L-01-087 dated June 29, 2001. The LAR updates the technical specification heatup and cooldown curves and the overpressure protection system setpoints to apply for up to 22 effective full power years. The applicability of the current curves will expire at 16 effective full power years.

The RAI received on October 26, 2001 contained six NRC questions pertaining to material properties appearing in WCAP-15570 and WCAP-15571. The FENOC responses are provided in Attachment A of this letter. There are three enclosures to this letter. Enclosure 1 contains a Westinghouse authorization letter, CAW-01-1497 accompanying affidavit, Proprietary Information Notice, and Copyright Notice. Enclosure 2 contains the Class 2 (Proprietary) responses to NRC Questions 3 and 5. Enclosure 3 contains the Class 3 (Non-Proprietary) responses to NRC Questions 3 and 5.

As Enclosure 2 contains information proprietary to Westinghouse Electric Company, it is supported by an affidavit signed by Westinghouse, the owner of the information. The affidavit 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 Section 2.790 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 Section 2.790 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse Affidavit should reference CAW-01-1497 and should be addressed to Mr. John S. Galembush, Acting Manager, Regulatory and

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Licensing Engineering, Westinghouse Electric Company, LLC, P.O. Box 355,
Pittsburgh, Pennsylvania 15230-0355.

FENOC requests NRC approval of the proposed changes by February 1, 2002, to implement the amendment and allow continued operation beyond the current period of 16 effective full power years. An implementation period of up to 60 days is requested following the effective date of this amendment.

This information does not change the evaluations or conclusions presented in FENOC letter L-01-006. If there are any questions concerning this matter, please contact Mr. Thomas S. Cosgrove, Manager Regulatory Affairs at 724-682-5203.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 1, 2001.

Sincerely,



Lew W. Myers

Attachment

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)

Responses to Request for Additional Information Pertaining to LAR 292

10/26/01 NRC Questions

- 1) Regarding the CVNGRAPH evaluations of Charpy V-notch curves in WCAP-15571, Revision 0, which serve as the basis for much of the work in the current submittal; explain how and why the upper shelf energy was fixed for the plots of CVN Energy vs. Temp given in Appendix C. It is not clear to the staff how this value could be fixed a priori in a manner consistent with ASTM E185-82 for the curves generated from the testing of the irradiated surveillance capsule material. If determined to be necessary, reevaluate the CVN 30 ft-lb shift and USE drop values for the BV Unit 1 materials based on a CVNGRAPH evaluation which does not utilize a fixed USE value.
- (2) In comparing the surveillance material test results in WCAP-15771, Rev. 0, to the values in WCAP-15570, Rev. 2 Table 4-11, it appears that there may be an inconsistency. Compare the delta RTndt values cited for the Beaver Valley surveillance weld material (heat 305424) in Table 4-11 to the data given in Figure 5-7 of WCAP-15771, Rev. 0. Explain any differences.
- (3) For clarity, the staff would also like to discuss Tables 4-20 and 4-21 from WCAP-15570, Rev. 2, with the licensee to understand exactly which sets of values the licensee is proposed to utilize in defining their licensing basis on the determination of RPV material properties.
- (4) Regarding Table 4-8 of WCAP-15570, Rev. 2, the staff would like to confirm with the licensee which copper and nickel content values from this table are being assigned to relevant surveillance and RPV materials. Further, the staff would like to know if the apparent chemical composition difference between the BV Unit 1 surveillance weld and the related BV Unit 1 RPV weld was accounted for the RPV material property evaluations performed in line 7 of Tables 4-20 and 4-21 of the same WCAP.
- (5) In order to facilitate the staff's review, we request that the licensee submit supporting data relevant to the pressure-temperature limit curves defined by the data points in Tables 5-3 and 5-4 of WCAP-15770, Rev. 2. For the various heatup and cooldown curves, the staff would request the following information for each (temperature, pressure) pair:
 - the calculated stress intensity due to pressure (i.e., K_{Ip}) for a 1/4T and 3/4T flaw,
 - the calculated stress intensity due to thermal loads (i.e., K_{It}) for a 1/4T and 3/4T flaw,
 - the metal temperature at the 1/4 T depth for the limiting material,
 - the material's Mode I fracture toughness (KI) at the 1/4T depth,
 - the metal temperature at the 3/4 T depth for the limiting material, and
 - the material's Mode I fracture toughness (KI) at the 3/4T depth.

Based on the availability of output from the Westinghouse OPERLIM computer code, the NRC staff anticipates that compilation of this information should not be difficult.

- (6) Confirm that the all relevant neutron fluence values cited in WCAP-15570, Rev. 2, reflect strictly calculated values and do not include value modifications introduced by the use of Westinghouse's FERRET code. If the values in WCAP-15570, Rev. 2, have been produced using FERRET, explain why this is appropriate and, if available, cite a reference where the NRC staff has explicitly approved the use of FERRET for the determination of neutron fluence values at BV Unit 1.

Responses

A conference call between NRC, FENOC and Westinghouse personnel was held on November 1, 2001, to discuss the above questions. During the conference call acceptable clarification was provided to Questions 1, 2 and 4. The NRC stated that since only clarification was required for these questions, no docketed response was necessary. Question 6 was withdrawn by the NRC during the conference call.

Responses to Questions 3 and 5 are provided in Enclosures 2 (Class 2 Proprietary) and 3 (Class 3 Non-Proprietary).

Enclosure 1

Westinghouse authorization letter,
CAW-01-1497 accompanying affidavit,
Proprietary Information Notice, and
Copyright Notice.



Westinghouse Electric Company, LLC

Box 355
Pittsburgh Pennsylvania 15230-0355

November 20, 2001

CAW-01-1497

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

Attention: Mr. Samuel J. Collins

**APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE**

Subject "Responses to Request for Additional Information for the Capsule Y – Pressure and Temperature Curves for Beaver Valley Unit 1"

Dear Mr. Collins:

The proprietary information for which withholding is being requested in the above-referenced responses to RAIs which are further identified in Affidavit CAW-01-1497 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 2.790 of the Commission's regulations.

Accordingly, this letter authorizes 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-01-1497 and should be addressed to the undersigned.

Very truly yours,

John S. Galembush, Supervisory Engineer
Regulatory and Licensing Engineering

Enclosures

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

SS

COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared John S. Galembush, 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:



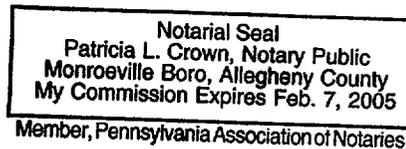
A handwritten signature in black ink, appearing to read "John S. Galembush".

John S. Galembush, Supervisory Engineer
Regulatory and Licensing Engineering

Sworn to and subscribed
before me this 20th day
of November, 2001

A handwritten signature in black ink, appearing to read "Patricia L. Crown".

Notary Public



- (1) I am Supervisory Engineer, Regulatory and Licensing Engineering, in Nuclear Services at 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 rulemaking 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 2.790 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 LLC 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 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 which 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 " Responses to Request for Additional Information for the Capsule Y – Pressure and Temperature Curves for Beaver Valley Unit 1" [Proprietary] being transmitted by FirstEnergy Nuclear Operating Company letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk, Attention Mr. Samuel J. Collins. The proprietary information as submitted for use by FirstEnergy Nuclear Operating Company for the Beaver Valley Units is expected to be applicable in other licensee submittals in response to certain NRC requirements for uprating.

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

- (a) Provide documentation of the analysis, methods, which were used for the allowable Pressure and Temperature Limits.
- (b) Calculate the allowable values for the Technical Specification Pressure and Temperature Curves.
- (c) Assist the customer to obtain NRC approval.

Further this information has substantial commercial value as follows:

- (a) Westinghouse plans to sell the use of similar information to its customers for purposes of meeting NRC requirements for licensing documentation.
- (b) Westinghouse can sell support and defense of the technology to its customers in the licensing process.

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 calculation, evaluation 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 knowledge 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 analytical methods and performing tests.

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 2.790 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) contained within parentheses 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 reports transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies of 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 those 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.

Enclosure 3

Class 3 (Non-Proprietary) responses to NRC questions 3 and 5.

NRC Question # 3:

For clarity, the staff would also like to discuss Tables 4-20 and 4-21 from WCAP-15570, Rev. 2 with the licensee to understand exactly which sets of values the licensee is proposed to utilize in defining their licensing basis on the determination of RPV material properties.

Response to NRC Question # 3:

In the event there is credible surveillance data, then that data set shall be utilized. In the event that non-credible surveillance data exists, then the data set providing the more conservative value (Position 1.1 or 2.1) will be utilized. Note that the adjusted reference temperature for the surveillance data will be calculated using the full σ_{Δ} in accordance with NRC methodology presented at the February 12, 13, 1998 Industry Meeting.

The following Table presents the summary of the Position taken for each beltline material at EOL (28 EFPY):

Table 1
Summary of Licensing Basis on the RPV Materials

RPV Material	Reg. Guide Position
Intermediate Shell Plate B6607-1	Position 1.1
Intermediate Shell Plate B6607-2	Position 1.1
Lower Shell Plate B7203-2	Position 1.1
Lower Shell Plate B6903-1	Position 2.1*
Intermediate Shell Long. Weld 19-714A/B	Position 1.1**
Inter. to Lower Shell Circ. Weld 11-714	Position 2.1***
Lower Shell Long. Weld 20-714A/B	Position 2.1*

* Non-Credible Surveillance Data, Position 2.1 has more conservative ART.

** Non-Credible Surveillance Data, Position 1.1 has more conservative ART.

*** Credible Surveillance Data.

NRC Question # 5:

In order to facilitate the staff's review, we request that the licensee submit supporting data relevant to the pressure-temperature limit curves defined by the data points in Tables 5-3 and 5-4 of WCAP-15770, Rev. 2. For the various heatup and cooldown curves, the staff would request the following information for each (temperature, pressure) pair:

- the calculated stress intensity due to pressure (i.e., $K_I p$) for a 1/4T and 3/4T flaw
- the calculated stress intensity due to thermal loads (i.e., $K_I t$) for a 1/4T and 3/4T flaw
- the metal temperature at the 1/4 T depth for the limiting material,
- the material's Mode I fracture toughness (K_I) at the 1/4T depth
- the metal temperature at the 3/4 T depth for the limiting material,
- the material's Mode I fracture toughness (K_I) at the 3/4T depth

Based on the availability of output from the Westinghouse OPERLIM computer code, the NRC staff anticipates that compilation of this information should not be difficult.

Response to NRC Question # 5:

Tables 2 through 4 provide the K_{it} and K_{ip} values at the $\frac{1}{4}$ T and $\frac{3}{4}$ T locations for Steady State, 100°F/hr Cooldown and 100°F Heatup at 22 EFY. The Tables also provide the $\frac{1}{4}$ T and $\frac{3}{4}$ T Wall Temperatures [Note: This data is in reference to Tables 5-3 and 5-4 from WCAP-15570 Revision 1]. The $\frac{1}{4}$ T and $\frac{3}{4}$ T K_{ic} values were not provided as requested since the Westinghouse Operlim Computer Code does not provide that value as an output. However, it should be noted that the OPERLIM Computer Program utilizes the following equation for K_{ic} :

$$K_{ic} = 33.2 + 20.734 * e^{[0.02(T - RT_{NDT})]}$$

Where: T = $\frac{1}{4}$ T or $\frac{3}{4}$ T Wall Temperature
 RT_{NDT} = $\frac{1}{4}$ T or $\frac{3}{4}$ T ART

