

**ATTACHMENT 3**

**Westinghouse Application for Withholding, Affidavit,  
and Non-Proprietary Version of Attachment 2**



Westinghouse Electric Company  
Nuclear Services  
P.O. Box 355  
Pittsburgh, Pennsylvania 15230-0355  
USA

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

Direct tel: (412) 374-4419  
Direct fax: (412) 374-4011  
e-mail: maurerbf@westinghouse.com

Our ref: CAW-06-2102

February 9, 2006

APPLICATION FOR WITHHOLDING PROPRIETARY  
INFORMATION FROM PUBLIC DISCLOSURE

Subject: NF-BEX-06-40 P-Attachment, "Westinghouse Input to Quad Cities Nuclear Power Station, Unit 2 – Request for Additional Information Regarding Safety Limit Minimum Critical Power Ratio Evaluation" (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-06-2102 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 Exelon Nuclear.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-06-2102 and should be addressed to B. F. Maurer, Acting Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Very truly yours,

A handwritten signature in black ink, appearing to read 'B. F. Maurer', written over a horizontal line.

B. F. Maurer, Acting Manager  
Regulatory Compliance and Plant Licensing

Enclosures

cc: F. M. Akstulewicz/NRR  
P. M. Clifford/NRR  
M. Banerjee/NRR  
G. S. Shukla/NRR  
L. M. Feizollahi/NRR (affidavit only)

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared B. F. Maurer, 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:

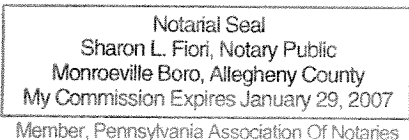


B. F. Maurer, Acting Manager  
Regulatory Compliance and Plant Licensing

Sworn to and subscribed  
before me this 10<sup>th</sup> day  
of February, 2006



Notary Public



- (1) I am Acting Manager, Regulatory Compliance and Plant Licensing, 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 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 NF-BEX-06-40 P-Attachment, "Westinghouse Input to Quad Cities Nuclear Power Station, Unit 2 – Request for Additional Information Regarding Safety Limit Minimum Critical Power Ratio Evaluation" (Proprietary), for response to request for additional information for the Technical Specifications change for minimum critical power ratio safety limit, being transmitted by Exelon Nuclear letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse for the Quad Cities Units 1 and 2 is expected to be applicable for other licensee submittals in response to certain NRC requirements for justification of SVEA-96 Optima2 License Amendment Request.

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

- (a) Provide technical information in support of the Technical Specification change for the minimum critical power ratio safety limit.
- (b) Assist customer to respond to NRC RAIs.

Further this information has substantial commercial value as follows:

- (a) Westinghouse can use this information to further enhance their licensing position with their competitors.
- (b) 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 analyses 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).

### **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 2.390 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.

**Westinghouse Input to Quad Cities Nuclear  
Power Station, Unit 2 – Request for Additional  
Information Regarding Safety Limit Minimum  
Critical Power Ratio Evaluation**

**February 9, 2006**

---

Westinghouse Electric Company  
P.O. Box 355  
Pittsburgh, PA 15230-0355

© 2006 Westinghouse Electric Company LLC  
All Rights Reserved

---



#### **NRC Request 4**

Provide clarification that the calculated SLMCPR in Table 1 of Attachment 5 for GE14 fuel for Cycle 19 is the same as that in Cycle 18 for dual-loop operation and single-loop operation since the Cycle 19 is an aggressive mixed core operation and the once burned fuel may still dominate.

#### **Response**

The dual-loop operation (DLO) and single-loop operation (SLO) safety limit minimum critical power ratio (SLMCPR) values of 1.09 and 1.10, respectively, in Table 1 of Attachment 5 of Reference 1 are being applied to the GE14 fuel in Cycle 19 and are the same as those applied in Cycle 18.

The approved methodology described in Reference 2 was used to establish the Cycle 19 SLMCPRs for the GE14 and SVEA-96 Optima2 fuel. Specifically, this Licensing Analysis treatment of SLMCPR in mixed cores involving non-Westinghouse legacy fuel [

] <sup>a,c</sup> As noted in Attachment 5 of Reference 1, Cycle 18 was dominated by GE14 fuel since it contained 508 GE14 fuel assemblies and 216 ATRIUM-9B fuel assemblies. All of the ATRIUM-9B fuel assemblies were in their third cycle of operation and were loaded on or near the core periphery in Cycle 18 (i.e., within the outer three rows). As noted in Attachment 5 of Reference 1, the GE14 fuel was loaded in the central part of the core. Therefore, the SLMCPR for Cycle 18 was established by contributions from the GE14 fuel assemblies [

] <sup>a,c</sup>

As noted in Attachment 5 of Reference 1, the Cycle 19 SLMCPR for Westinghouse SVEA-96 Optima2 fuel assemblies was established by assuming that [

] <sup>a,c</sup>

The SVEA-96 Optima2 SLMCPR for DLO is calculated at 100% power and 100% flow at statepoints throughout the cycle to assure that the limiting SLMCPR is identified. This process captures the interplay between assembly CPR and relative fuel rod CPR distributions to identify the point in the cycle when the SLMCPR reaches a maximum. As shown in Figure 4 in Attachment 5 of Reference 1, [

] <sup>a,c</sup>

SLO SVEA-96 Optima2 SLMCPR calculations are performed at the statepoints at which the most limiting (i.e., highest) DLO SLMCPR values are calculated to assess the impact of the increased uncertainty in the core flow. As shown in Figure 4 in Attachment 5 of Reference 1, [

] <sup>a,c</sup>

Therefore, the licensing analysis methodology described in Reference 2 involves simultaneous application of [ <sup>a,c</sup>

[

] <sup>a,c</sup>

This methodology is conservative since [

] <sup>a,c</sup> Physically, this conclusion is a consequence of the following.

1. In general, the calculated SLMCPR is determined by the CPR uncertainties, channel bow, and the number of fuel rods with CPRs near the minimum CPR (i.e., the fuel rod CPR distribution.) The primary component impacting the SLMCPR which changes throughout the cycle is the number of fuel rods with CPRs near the minimum CPR, which is a function of the uniformity (i.e., flatness) of the assembly CPR distribution across the core and the flatness of the relative pin CPR distributions within the assemblies. Greater flatness in either parameter yields more rods susceptible to boiling transition and, thus, a higher SLMCPR.
2. The interplay between the relative fuel assembly CPR and bundle relative pin-by-pin CPR distributions generally causes the limiting SLMCPR to occur late in the cycle when the feed fuel is dominating the population of rods in dryout. For example, end-of-full-power-life (EOFPL) for the Cycle 19 Reference Core discussed in Attachment 5 of Reference 1 [

] <sup>a,c</sup> For higher cycle burnups, the GE14 minimum CPRs increase relative to the SVEA-96 Optima2 fuel minimum CPRs, thereby tending to remove the once-burned GE14 contribution to the number of rods in dryout in the SLMCPR determination at the cycle burnups at which the maximum SLMCPR is established.

3. The second-cycle fuel (e.g., GE14 fuel loaded in Cycle 18) [

] <sup>a,c</sup>

### NRC Request 5

It appears that there is no effect on the SLMCPR calculation due to the fuel channel bow. Provide information for mean and standard deviation for both Westinghouse SVEA 96 Optima 2 and GNF GE14 fuel channel bow as shown in Table 2 of Attachment 5 and describe their impact on the Cycle 19 SLMCPR values.

### Response

The effects of channel bow are included in the SLMCPR calculations described in Reference 1. Channel bow is described in the SLMCPR calculations as a mean bow and standard deviation relative to the mean as a function of burnup. The channel bows used in the SLMCPR calculations for the SVEA-96 Optima2 fuel locations are based on the current 10x10 SVEA databases for asymmetric and symmetric assembly lattice plants. These current symmetric and asymmetric 10x10 SVEA channel bow databases are shown in the response to Request for Additional Information (RAI) 15 of Reference 3.

The symmetric and asymmetric lattice databases contain both Zry-2 and Zry-4 channels. [

] <sup>a,c</sup>

QCNP Unit 2 is an asymmetric lattice plant, [

] <sup>a,c</sup>

Comparison of standard deviations calculated from the combined [

] <sup>a,c</sup>

The measured channel bows discussed above provide maximum values established for a given channel, and these values occur near the axial mid-plane of the channel. [

] <sup>a,c</sup> The resulting channel bows for SVEA-96 Optima2 fuel were used in the SLMCPR calculations.

Additionally, Exelon Generation Company, LLC (EGC) provided channel bow data appropriate for GE14 fuel to Westinghouse to support the SLMCPR calculations documented in Reference 1.

There is an impact of channel bow on the SLMCPR. For example, the limiting DLO SVEA-96 Optima2 SLMCPR of [

the SLMCPR. ]<sup>a,c</sup> Therefore, channel bow does effect

### **References**

1. Letter from P. R. Simpson (Exelon Generation Company, LLC) to U. S. NRC, "Request for Technical Specifications Change for Minimum Critical Power Ratio Safety Limit," dated December 15, 2005
2. CENPD-300-P-A, "Reference Safety Report for Boiling Water Reactor Reload Fuel," dated July 1996
3. WCAP-15942-P-A, "Fuel Assembly Mechanical Design Methodology for Boiling Water Reactors, Supplement 1 to CENPD-287-P-A," dated November 2005