



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) 374-4643
Direct fax: (412) 374-4011
e-mail: greshaja@westinghouse.com

Our ref: LTR-NRC-04-20

April 15, 2004

Subject: Response to NRC Request for Additional Information on Addendum 3 to WCAP-10266-P-A, Rev. 2 (Proprietary) and WCAP-11524-A, Rev. 2 (Non-Proprietary)

- References:
1. Addendum 3 to WCAP-10266-P-A, Revision 2 and WCAP-11524-A, Revision 2, "Incorporation of the LOCBART Transient Extension Method into the 1981 Westinghouse Large Break LOCA Evaluation Model with BASH (BASH-EM)", December 2002.
 2. Letter from H. A. Sepp (Westinghouse) to J. S. Wermiel (NRC), "Submittal of Addendum 3 to WCAP-10266-P-A, Rev. 2 (Proprietary) and WCAP-11524-A, Rev. 2 (Non-Proprietary), 'Incorporation of the LOCBART Transient Extension Method into the 1981 Westinghouse Large Break LOCA Evaluation Model with BASH (BASH-EM)'" , LTR-NRC-02-67, December 18, 2002.

Enclosed are copies of proprietary and non-proprietary versions of the Westinghouse responses to Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) items 1c, 1d, 1e, and 1g regarding Addendum 3 to WCAP-10266-P-A, Revision 2 and WCAP-11524-A, Revision 2 (Reference 1). This topical report was submitted for NRC review and approval on December 18, 2002 (Reference 2). Also enclosed are:

1. One (1) copy of the Application for Withholding, AW-04-1813 (Non-Proprietary) with Proprietary Information Notice and Copyright Notice.
2. One (1) copy of Affidavit, AW-04-1813 (Non-Proprietary).

This submittal contains proprietary information of Westinghouse Electric Company, LLC. In conformance with the requirements of 10 CFR Section 2.390, as amended, of the Commission's regulations, we are enclosing with this submittal an Application for Withholding from Public Disclosure and an affidavit. The affidavit sets forth the basis on which the information identified as proprietary may be withheld from public disclosure by the Commission.

T007

Page 2 of 2
Our ref: LTR-NRC-04-20
April 15, 2004

Correspondence with respect to the affidavit or Application for Withholding should reference AW-04-1813 and should be addressed to J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Very truly yours,



J. A. Gresham, Manager
Regulatory Compliance and Plant Licensing

Enclosures

cc: B. J. Benney

Westinghouse Non-Proprietary Class 3

Response to NRC Request for Additional Information on Addendum 3 to WCAP-10266-P-A, Rev. 2 (Proprietary) and WCAP-11524-A, Rev. 2 (Non-Proprietary)

- 1c. *As the late reflood period progresses, the liquid head in the core increases due to the lower decay heat which can further degrade the reflood rate. Please show that this is accounted for in the model during the entire boiling period and until the core is quenched. Does Figure 4-8 cover the expected change in liquid level over the time period the downcomer boils and is quenched? Does this figure cover all plants? Please explain.*

Response

[

]a.c

[

.

jac

Figure 1c-1

[

] ^{a,c}

Figure 1c-2

[

]a.c

Figure 1c-3

[

]a.c

Figure 1c-4

[

]a.c

Figure 1c-5

[

j^{a.c}

Figure 1c-6

[

j^{a.c}

Figure 1c-7

[

.

]a.c

Figure 1c-8

[

J^{a,c}

- 1d. *Does Figure 4-7 present only the effect of pressure on the liquid head? Since the boiling period can last for one thousand seconds, what is the expected minimum pressure and show that Figure 4-7 covers the range. Please justify the omission of steam binding effects on the reflood rate based on the minimum expected pressure at quench.*

Response

(Please see the response to RAI #1c.)

- 1e. *If the reflood rate decreases, RCS pressure could also decrease, further increasing steam binding. Containment pressure can also decrease during late reflood periods. Please account for the potential for decreasing RCS pressure and/or containment pressure on the computed reflood rate out to and including core quench.*

Response

(Please see the response to RAI #1c.)

- 1g. *As identified in Reference [2], page 13, the uncertainty in the Sudo void correlation is 15%. Is this correction applied to the void and hence liquid head computation? If not, please include the 15% error in the corrected void/head computation.*

Reference

[2] Sudo, Yukio, "Estimation of Average Void Fraction in Vertical Two-Phase Flow Channel Under Low Liquid Velocity", *Journal of Nuclear Science and Technology*, 17(1), pp. 1-15, January 1980.

Response

As shown in Figure 4-1 of the Topical Report, the Sudo Correlation predicts the basis data to within about $\pm 15\%$. Good agreement is observed over a fairly wide range of conditions, with no particular tendency to either over-predict or under-predict the data. Applying this correlation at its best estimate as shown on p. 3-2 of the Topical Report is considered to be a reasonable approach, and biasing the prediction to the upper end of the error band is considered to be unnecessary.

While Appendix K was designed to produce a generally conservative prediction, it does not require that every individual model and correlation be treated in a bounding manner. In the BASH Evaluation Model (BASH-EM), significant conservatism is introduced not only through the application of Appendix K requirements, but also through the particularly conservative treatment of various phenomena such as refill heat transfer, assembly blockage, and spacer grid heat transfer. Comparisons against results obtained using the 1996 Westinghouse Best Estimate LOCA Evaluation Model have consistently and repeatedly demonstrated the overall conservatism of BASH-EM, including the two examples presented in Section 5.6 of the Topical Report. This overall conservatism is more than adequate to justify the application of the Sudo Correlation at its best estimate, particularly given the good agreement between the correlation and experimental data.



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) 374-4643
Direct fax: (412) 374-4011
e-mail: greshaja@westinghouse.com

Our ref: AW-04-1813.

April 15, 2004

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

Subject: Response to NRC Request for Additional Information on Addendum 3 to WCAP-10266-P-A, Rev. 2 (Proprietary) and WCAP-11524-A, Rev. 2 (Non-Proprietary)

Reference: LTR-NRC-04-20, dated April 15, 2004.

The Application for Withholding is submitted by Westinghouse Electric Company LLC (Westinghouse), pursuant to the provisions of Paragraph (b) (1) of Section 2.390 of the Commission's regulations. It contains commercial strategic information proprietary to Westinghouse and customarily held in confidence.

The proprietary material for which withholding is being requested is identified in the proprietary version of the Enclosure to the Reference letter. In conformance with 10 CFR Section 2.390, Affidavit AW-04-1813 accompanies this Application for Withholding, setting forth the basis on which the identified proprietary information may be withheld from public disclosure.

Accordingly, it is respectfully requested that the subject information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to this Application for Withholding or the accompanying affidavit should reference AW-04-1813 and should be addressed to J. A. Gresham, 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 'J. A. Gresham'.

J. A. Gresham, Manager
Regulatory Compliance and Plant Licensing

Enclosures

cc: B. Benney

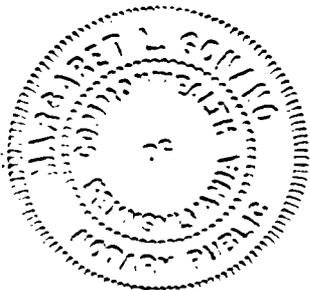
AFFIDAVIT

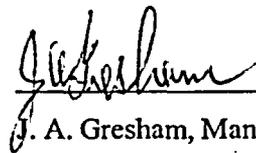
COMMONWEALTH OF PENNSYLVANIA:

SS

COUNTY OF ALLEGHENY:

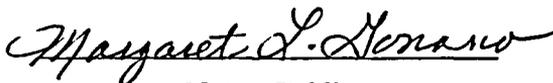
Before me, the undersigned authority, personally appeared J. A. Gresham, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit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





J. A. Gresham, Manager
Regulatory Compliance and Plant Licensing

Sworn to and subscribed
before me this 15th day
of April, 2004


Notary Public

Notarial Seal
Margaret L. Gonano, Notary Public
Monroeville Boro, Allegheny County
My Commission Expires Jan. 3, 2006
Member, Pennsylvania Association Of Notaries

- (1) I am 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.
- (g) The information is not the property of Westinghouse, but must be treated as proprietary by Westinghouse according to agreements with the owner.

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.
 - (g) Unrestricted disclosure would violate a proprietary agreement between Westinghouse and the owner of the information.
- (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 Response to NRC Request for Additional Information on Addendum 3 to WCAP-10266-P-A, Rev. 2 (Proprietary) and WCAP-11524-A, Rev. 2 (Non-Proprietary), being transmitted by Westinghouse letter (LTR-NRC-04-20) and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted for use by Westinghouse is expected to be applicable in other licensee submittals in response to certain NRC requirements for justification of large break LOCA analysis predictions.

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

- (a) Extend LOCBART calculations beyond the point at which downcomer boiling is predicted to occur in BASH.

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 large break LOCA analysis predictions, including the LOCBART Transient Extension Method.
- (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 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 several months of development 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 (g) 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)(g) 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.