

PROPRIETARY



Nuclear Innovation  
North America LLC  
122 West Way, Suite 405  
Lake Jackson, Texas  
77566

July 30, 2014  
U7-C-NINA-NRC-140022  
10 CFR 2.390

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2738

South Texas Project  
Units 3 and 4  
Docket No. PROJ0772  
Response to Request for Additional Information

References:

1. Letter from Tom Tai to Scott Head, Request for Additional Information re: South Texas Project Nuclear Operating Company Topical Report WCAP-17137-P, "Westinghouse Stability Methodology for the ABWR", February 27, 2014 (ML14034A268)
2. Letter from Tom Tai to Scott Head, Request for Additional Information re: South Texas Project Nuclear Operating Company Topical Report WCAP-17137-P, "Westinghouse Stability Methodology for the ABWR", February 24, 2014

Attached are responses to three of the RAI questions in the referenced letters. Responses to the following RAI questions are provided in this letter:

RAI 4.04-1  
RAI 4.04-2  
RAI 4.04-3

The responses to these RAI questions contain information proprietary to Westinghouse Electric Corporation. **When separated from the proprietary attachments, this letter is not proprietary.**

Since this letter contains information proprietary to Westinghouse Electric Company LLC, 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 2.390 of the Commission's regulations.

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

Attachments 1 through 3 contain the proprietary responses to the three RAI questions. Attachments 4 through 6 contain the non-proprietary responses. Attachment 7 contains the request for withholding of proprietary information, the affidavit, the proprietary information notice, and the copyright notice.

Correspondence with respect to the copyright or proprietary aspects of this information or the supporting Westinghouse Affidavit should reference CAW-14-3997 and should be addressed to: J. A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company LLC, Suite 428, 1000 Westinghouse Drive, Cranberry Township, Pennsylvania, 16066.

If you have any questions, please contact me at (979) 316-3011, or Bill Mookhoek at (979) 316-3014.

There are no commitments in this letter.

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

Executed on 7/30/14



Scott Head  
Manager, Regulatory Affairs  
Nuclear Innovation North America LLC

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**Attachments:**

1. RAI 4.04-1 (Proprietary)
2. RAI 4.04-2 (Proprietary)
3. RAI 4.04-3 (Proprietary)
4. RAI 4.04-1 (Non-Proprietary)
5. RAI 4.04-2 (Non-Proprietary)
6. RAI 4.04-3 (Non-Proprietary)
7. Request for Withholding Proprietary Information

cc: w/o attachment except\*  
(paper copy)

(electronic copy)

Director, Office of New Reactors  
U. S. Nuclear Regulatory Commission  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2738

\*Tom Tai  
\*James Steckel  
\*Bruce Olson  
Fred Brown  
U. S. Nuclear Regulatory Commission

Regional Administrator, Region IV  
U. S. Nuclear Regulatory Commission  
1600 E. Lamar Blvd.  
Arlington, TX 76011-4511

Jamey Seely  
Nuclear Innovation North America

Kathy C. Perkins, RN, MBA  
Assistant Commissioner  
Division for Regulatory Services  
Texas Department of State Health Services  
P. O. Box 149347  
Austin, Texas 78714-9347

Peter G. Nemeth  
Crain, Caton & James, P.C.

Robert Free  
Radiation Inspections Branch Manager  
Texas Department of State Health Services  
P. O. Box 149347  
Austin, Texas 78714-9347

Richard Peña  
Kevin Pollo  
L. D. Blaylock  
CPS Energy

\*Steven P. Frantz, Esquire  
A. H. Gutterman, Esquire  
Morgan, Lewis & Bockius LLP  
1111 Pennsylvania Ave. NW  
Washington D.C. 20004

\*Tom Tai  
\*James Steckel  
\*Bruce Olson  
Two White Flint North  
11545 Rockville Pike  
Rockville, MD 20852

**RAI 4.04-1. Computer Codes****QUESTION:**

Section 6.1 “Computer Codes” of the LTR describes two codes: RAMONA-3 and POLCA-T and states that “The methodology described below is applicable to both computer codes.” However, the POLCA-T SER (ML091610251) only approved POLCA-T for decay ratio (DR) calculations. The POLCA-T SER specifically states that “POLCA-T is used [[

]].”

Confirm which methods are used for ABWR Solution III setpoint calculations. Specifically describe what methods are used for the DIVOM slope calculation. If the “historical methods” (RAMONA-3B/BISON/SLAVE) are used, provide justification why these methods are approved for use in ABWR.

**RESPONSE:**

The DIVOM slope methodology is described in Section 7.2.1 of WCAP-17137-P using POLCA-T.

In Section C.3.1.4 of Reference 1, which is currently under review by the NRC, calculated CPR is compared to [

]<sup>a,c</sup>. It is stated that POLCA-T is validated for the DIVOM analysis [

]<sup>a,c</sup>

In reload applications for the ABWR, approved codes will be used. [

]<sup>a,c</sup>

**References for RAI 4.04-1**

1. WCAP-16747-P Appendices C and D, “POLCA-T: System Analysis Code with Three-Dimensional Core Model Appendices C and D,” October 2010.

**RAI 4.04-2. CPR Correlations**

**QUESTION:**

What CPR correlations were used for the examples presented in WCAP-17137P? Have these correlations been reviewed by the staff?

**RESPONSE:**

For the examples in WCAP-17137-P, an [ ]<sup>a,c</sup> core is used with the approved CPR correlation described in References 1 and 2.

**References for RAI 4.04-2**

1. WCAP-16081-P-A, "10x10 SVEA Fuel Critical Power Experiments and CPR Correlation: SVEA-96 Optima2," March 2005.
2. WCAP-16081-P-A, Addendum 2, "SVEA-96 Optima2 CPR Correlation (D4): Modified R-factors for Part-Length Rods," July 2007.

**RAI 4.04-3. Applicability of CPR Correlation to oscillatory flow conditions****QUESTION:**

To define a DIVOM slope, the methodology must calculate the degradation of CPR margin caused by oscillatory power-flow conditions. Provide a validation of the use of the applicable CPR correlation under oscillatory power-flow conditions.

**RESPONSE:**

A validation of the CPR correlation at oscillatory power-flow conditions [ ]<sup>a,c</sup> POLCA-T provides a conservative transient dryout prediction for [ ]<sup>a,c</sup> using the CPR-correlation approved in References 2 and 3. In all cases, the CPR calculation conservatively shows  $CPR_{min}$  less than 1.0 prior to actual dryout, which is indicated by the measured cladding temperature response. See section C.3.1.4 of Appendix C of Reference 1 for more detail. The validation results demonstrate the code capability to calculate fuel channel dryout and rewet even in extreme flow conditions.



Figure RAI-3-1 POLCA-T Predicted CPR for [

] <sup>a,c</sup> Dryout Test.

[

] <sup>a,c</sup>

Figure RAI-3-2 POLCA-T Predicted CPR for [

] <sup>a,c</sup> Dryout Test.

[

] <sup>a,c</sup>

Figure RAI-3-3 POLCA-T Predicted CPR for [

] <sup>a,c</sup> Dryout Test.

### **References for RAI 4.04-3**

1. WCAP-16747-P Appendices C and D, "POLCA-T: System Analysis Code with Three-Dimensional Core Model Appendices C and D," October 2010.
2. WCAP-16081-P-A, "10x10 SVEA Fuel Critical Power Experiments and CPR Correlation: SVEA-96 Optima2," March 2005.
3. WCAP-16081-P-A, Addendum 2, "SVEA-96 Optima2 CPR Correlation (D4): Modified R-factors for Part-Length Rods," July 2007.



CAW-14-3997

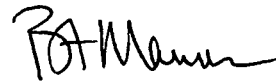
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COMMONWEALTH OF PENNSYLVANIA:

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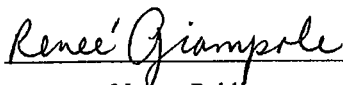
COUNTY OF BUTLER:

Before me, the undersigned authority, personally appeared Bradley 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:

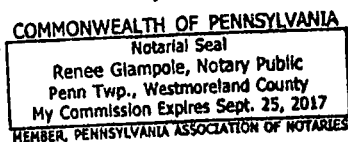


Bradley F. Maurer, Principal Engineer  
Plant Licensing

Sworn to and subscribed before me  
this 28th day of July 2014



Notary Public



- (1) I am Principal Engineer, Plant Licensing, 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.
- (iii) 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.
- (iv) 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.
- (v) 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.
- (vi) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in WEC-NINA-2014-0005 P-Enclosure: "Responses to RAIs 4.04-1, -2, and -3 for WCAP-17137-P, Revision 0, 'Westinghouse Stability Methodology for the ABWR'" (Proprietary) for submittal to the Commission, being transmitted by Nuclear Innovation North America (NINA) letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse is that associated with the NRC's review of the Westinghouse ABWR stability methodology in support of Westinghouse ABWR fuel products and may be used only for that purpose.
- (a) This information is part of that which will enable Westinghouse to:
  - (i) Assist the customer in obtaining NRC review of the Westinghouse stability methodology as applied to ABWR plant designs.

- (b) Further this information has substantial commercial value as follows:
- (i) Westinghouse plans to sell the use of this information to its customers for purposes of plant specific ABWR stability analyses and implementation for licensing basis applications.
  - (ii) Its use by a competitor would improve their competitive position in the design and licensing of a similar product for ABWR stability analysis methodology.
  - (iii) 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 technical 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 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.