PROPRIETARY INFORMATION – WITHHOLD UNDER 10 CFR 2.390

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

December 10, 2012

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

Serial No. 12-330A
NL&OS/ETS R1
Docket Nos. 50-338/339
License Nos. NPF-4/7

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
NORTH ANNA POWER STATION UNITS 1 AND 2
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
30-DAY REPORT OF EMERGENCY CORE COOLING SYSTEM (ECCS)
MODEL CHANGES PURSUANT TO THE REQUIREMENTS OF 10 CFR 50.46

By letter dated May 16, 2012 (Reference 1), Dominion submitted information regarding an evaluation of fuel pellet thermal conductivity with fuel burnup in the Westinghouse Best Estimate Large Break Loss of Coolant Accident (LBLOCA) analysis methodology for North Anna Power Station (NAPS) Units 1 and 2 and its effect on peak cladding temperature (PCT). Attachment 1 to that letter described the evaluation to determine the estimated PCT effect of fuel pellet thermal conductivity degradation (TCD) and peaking factor burndown. In an October 12, 2012 e-mail (Reference 2), the U.S. Nuclear Regulatory Commission (NRC) requested additional information regarding the evaluation of fuel pellet TCD with fuel burnup. The purpose of this letter is to provide the information requested by the NRC. Attachment 1 provides Dominion's response to the two NRC questions and includes information that is proprietary to Westinghouse as discussed further below. In addition, in response to a request from the NRC staff, a CD-ROM containing the proprietary data is also included in Attachment 1.

Proprietary Information

Attachment 1 and the accompanying CD-ROM contain information proprietary to Westinghouse Electric Company LLC. This Classification is supported by a Westinghouse Application for Withholding Proprietary Information from Public Disclosure and the accompanying Affidavit signed by Westinghouse, the owner of the information, which is provided in Attachment 3. 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 10 CFR 2.390 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 2.390. Correspondence with respect to the copyright or proprietary aspects of Attachment 1 or the supporting Westinghouse affidavit should reference letter CAW-12-3574 dated November 30, 2012 and should be addressed to J. A. Gresham, Manager, Regulatory

Attachment 1 to this letter contains Proprietary Information which is to be withheld from public disclosure under 10 CFR 2.390.
Upon removal of the attachment, this letter is decontrolled.

A002
NRR

Compliance and Plant Licensing, Westinghouse Electric Company LLC, Suite 428, 1000 Westinghouse Drive, Cranberry Township, Pennsylvania 16066. A redacted (non-proprietary) version of Attachment 1 is included as Attachment 2 for public disclosure.

If you have any questions regarding this submittal, please contact Mr. Thomas Shaub at (804) 273-2763.

Sincerely,

J. Alan Price
Vice President – Nuclear Engineering

Commitments made in this letter: None

Attachments:

1. Response to NRC Request for Additional Information Regarding the Evaluation of Fuel Pellet Thermal Conductivity Degradation for the Westinghouse Large Break LOCA ECCS Evaluation Model – North Anna Power Station Units 1 and 2. (Proprietary)
2. Response to NRC Request for Additional Information Regarding the Evaluation of Fuel Pellet Thermal Conductivity Degradation for the Westinghouse Large Break LOCA ECCS Evaluation Model – North Anna Power Station Units 1 and 2. (Redacted)
3. Westinghouse Electric Company LLC, Application for Withholding Proprietary Information from Public Disclosure and the Accompanying Affidavit.

References:

1. Letter from J. Alan Price (Dominion) to USNRC, "Virginia Electric and Power Company (Dominion), North Anna Power Station Units 1 and 2, 30-Day Report of Emergency Core Cooling System (ECCS) Model Changes Pursuant to the Requirements of 10 CFR 50.46," Serial No. 12-330, May 16, 2012. (Agencywide Documents Access and Management System Accession No. ML12143A149)
2. Email from V. Sreenivas (USNRC) to David A. Heacock (Dominion), "Request for Additional Information (RAI): North Anna Power Station Units 1 and 2 - 30-day Report Regarding Thermal Conductivity Degradation in the Westinghouse Furnished Realistic Emergency Core Cooling Evaluation (TAC NOS. ME8727 AND ME8728)," October 12, 2012.

cc: U.S. Nuclear Regulatory Commission - Region II (without CD)
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, Georgia 30303-1257

Mr. J. E. Reasor, Jr. (without CD)
Old Dominion Electric Cooperative
Innsbrook Corporate Center
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Glen Allen, Virginia 23060

NRC Senior Resident Inspector (without CD)
North Anna Power Station

Dr. V. Sreenivas (without CD)
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Ms. K. R. Cotton (without CD)
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ATTACHMENT 2

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION REGARDING THE EVALUATION OF FUEL PELLET THERMAL CONDUCTIVITY DEGRADATION FOR THE WESTINGHOUSE LARGE-BREAK LOCA ECCS EVALUATION MODEL - NORTH ANNA POWER STATION UNITS 1 AND 2

(Redacted)

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION)
NORTH ANNA POWER STATION UNITS 1 AND 2

Westinghouse Suggested Response to NRC Request for Additional Information (RAI) Regarding the Fuel Thermal Conductivity Degradation (TCD) Evaluations for North Anna Units 1 and 2 NP-Attachment

(21 pages including this cover page)

Westinghouse Electric Company LLC
1000 Westinghouse Drive
Cranberry Township, PA 16066

Background

This letter provides responses to the Nuclear Regulatory Commission (NRC) requests for additional information (RAIs) regarding the fuel thermal conductivity degradation (TCD) evaluations for the North Anna Units 1 and 2 Reload Transition Safety Report (RTSR) Large-Break Loss-of-Coolant Accident (LBLOCA) analyses using the Automated Statistical Treatment of Uncertainty Method (ASTRUM) Evaluation Methodology. Information on the fuel TCD evaluations for Unit 1 and Unit 2 was previously provided to Dominion in Reference 1. The RAIs were transmitted via email and are provided below.

1. *Attachment 2 to the May 16, 2012, Emergency Core Cooling System (ECCS) Evaluation Model Change Report states that large run sets were performed to stabilize the estimate of the PCT results. Please provide the following run set data concerning the North Anna ECCS Evaluation that the NRC approved by letter dated February 29, 2012, and the currently reported estimate of the North Anna ECCS evaluation results:*

    a. *Run number*
    b. *Values of statistically sampled input parameters, including first and second cycle burnup values as appropriate*
    c. *Predicted peak cladding temperature*
    d. *Predicted time of peak cladding temperature*
    e. *Maximum local cladding oxidation*

2. *A method to estimate the effects of thermal conductivity degradation has been reported to the NRC as a correction for an ECCS evaluation model error. This method is described in a letter transmitted from Westinghouse to the NRC, dated March 7, 2012 (ADAMS Accession Number ML12072A035). This letter describes changes to the fuel performance modeling used to determine the fuel initial stored energy at the time of the hypothetical loss of coolant accident. Please explain whether this or a similar approach was used to estimate the effects of the change to the North Anna ECCS evaluation model, and identify and discuss any differences in the analytic approach.*

Clarification on RAI 1 was received verbally from the NRC, and based on the clarification, the run set data are provided for the [

]^{a,c}. Since only Unit 1 data is provided, the differences between Unit 1 and Unit 2 are discussed. In addition, an explanation of the treatment of randomly generated numbers (or seed) is provided.

Response to RAI 1:

Data

The requested run set data are provided in Tables 1 and 2. The particular parameters and the case set for first cycle were verbally agreed upon by the NRC and Dominion in a teleconference on October 11, 2012. It is noted that the information is sorted by run number.

Unit 1 and Unit 2 Comparison

The differences between the Unit 1 and Unit 2 LBLOCA ASTRUM analyses include physical plant differences and the [ ]^{a,c}. The physical differences between the Unit 1 and Unit 2 vessel are limited to the barrel/baffle configuration. Unit 1 is a converted upflow plant and Unit 2 has a downflow barrel/baffle configuration. The primary effect of the barrel/baffle configuration during a LBLOCA transient is the loss of liquid inventory during the early reflood period. As the core begins to recover, saturated or near saturated water enters the core region and vaporizes causing a re-pressurization and the beginning of an oscillatory period. The initial re-pressurization leads to a loss of liquid from the lower plenum/downcomer region out the break. An upflow barrel/baffle configuration tends to lead to larger liquid inventory loss based on the area differences / manometer effects illustrated in Figure 1. The loss of more liquid leads to a longer recovery period until the core begins reflood again, which tends to lead to a higher Peak Cladding Temperature (PCT).

The plant operating ranges analyzed in the Unit 1 and Unit 2 analyses are the same. [

]^{a,c}.

Seed Treatment

The [

]^{a,c}.

Reference(s)

1. VRA-12-31, "Dominion Generation North Anna Power Station Units 1 and 2 Thermal Conductivity Degradation Evaluation on the Large-Break LOCA BELOCA ASTRUM Analyses," May 10, 2012.

Response to RAI 2:

The method to estimate the effects of thermal conductivity degradation described in the letter transmitted from Westinghouse to the NRC, dated March 7, 2012 (ADAMS Accession Number ML12072A035) is the same approach used to estimate the effects of the change to the North Anna ECCS evaluation model. [

]^{a,c}

Table 1 – North Anna Unit 1 Analysis of Record [ ][a,c] Key Results and Run Attributes

[a,c]

[a,c]

[a,c

]

[a,c]

[a,c]

[a,c

]

[a,c]

[a,c]

Table 2 – North Anna Unit 1 [ ]^{a,c} TCD Key Results and Run Attributes

a,c

[a,c]

[a,c]

[a,c

]

[a,c]

[a,c]

[a,c

]

[ ] a,c

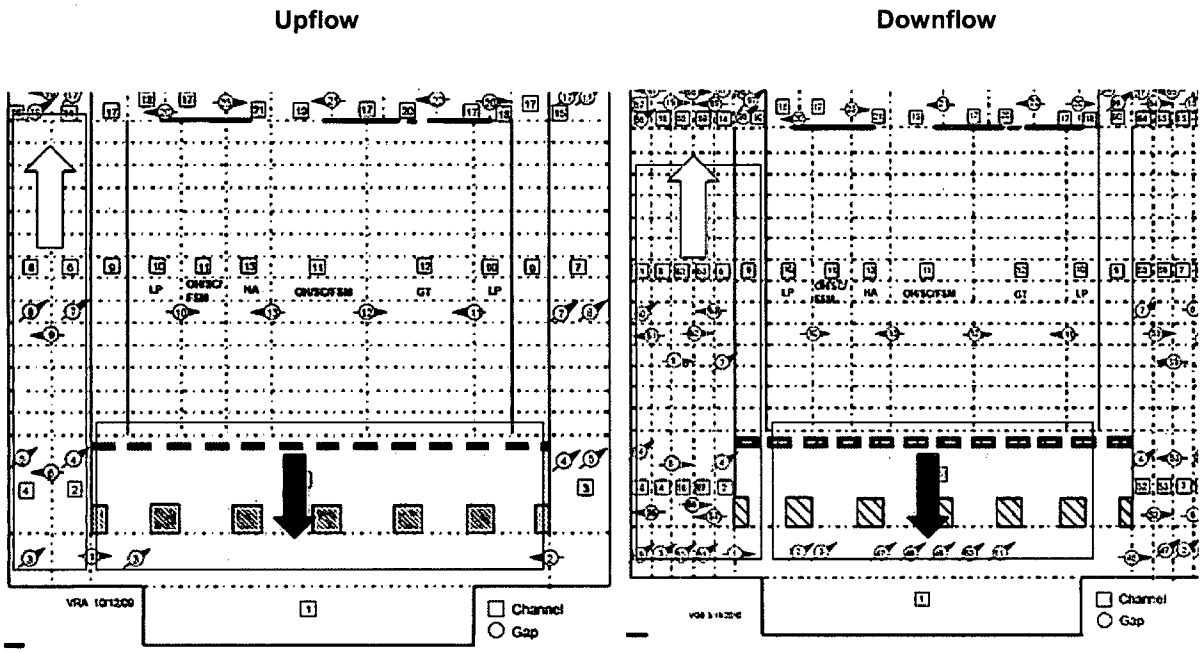

Figure 1: Illustration of Barrel/Baffle Configuration during Re-pressurization at Beginning of Core Recovery

ATTACHMENT 3

WESTINGHOUSE ELECTRIC COMPANY LLC, APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE AND THE ACCOMPANYING AFFIDAVIT

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION)
NORTH ANNA POWER STATION UNITS 1 AND 2

Westinghouse Electric Company
Nuclear Services
1000 Westinghouse Drive
Cranberry Township, Pennsylvania 16066
USA

U.S. Nuclear Regulatory Commission
Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Direct tel: (412) 374-4643
Direct fax: (724) 720-0754
e-mail: greshaja@westinghouse.com
Proj letter:

CAW-12-3574

November 30, 2012

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: LTR-LIS-12-622 P-Attachment, "Westinghouse Suggested Response to NRC Request for Additional Information (RAI) Regarding the Fuel Thermal Conductivity Degradation (TCD) Evaluations for North Anna Units 1 and 2" (Proprietary)
And CD containing Attachment 3, "Electronic Data Tables Supporting the Westinghouse Suggested Response to Fuel Thermal Conductivity Degradation (TCD) Evaluations for North Anna Units 1 and 2" (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-12-3574 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 Dominion.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference CAW-12-3574, and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, Suite 428, 1000 Westinghouse Drive, Cranberry Township, Pennsylvania 16066.

Very truly yours,

James A. Gresham, Manager
Regulatory Compliance

Enclosures

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

Before me, the undersigned authority, personally appeared James 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:

James A. Gresham, Manager
Regulatory Compliance

Sworn to and subscribed before me
this 30th day of November 2012

Notary Public

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Anne M. Stegman, Notary Public
Unity Twp., Westmoreland County
My Commission Expires Aug. 7, 2016
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Anne M. Stegman, Notary Public
Unity Twp., Westmoreland County
My Commission Expires Aug. 7, 2016
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

(1) I am Manager, Regulatory Compliance, 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 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.

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 LTR-LIS-12-622, P-Attachment (Attachment 1) and Attachment 3, "Westinghouse Suggested Response to NRC Request for Additional Information (RAI) Regarding the Fuel Thermal Conductivity Degradation (TCD) Evaluations for North Anna Units 1 and 2" (Proprietary), dated November 29, 2012, for submittal to the Commission, being transmitted by Dominion 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 results of and method for the Thermal Conductivity Degradation evaluations for North Anna Units 1 and 2, and may be used only for that purpose.

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

(a) Provide input to Dominion to provide to the U.S. Nuclear Regulatory Commission in response to NRC Request for Additional Information related to the North Anna 50.46 submittal.

(b) Provide licensing support for customer submittal.

Further this information has substantial commercial value as follows:

(a) Westinghouse can sell support and defense of the technology to its customer in the licensing process.

(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 calculations 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).

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