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RS-02-021

January 31, 2002

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: Response to Request for Additional Information Regarding a Previous License Amendment Request to Revise the Fuel Centerline Temperature Safety Limit for Byron and Braidwood Stations

Reference: Letter from T. W. Simpkin (Exelon Generation Company, LLC) to NRC, "Request for a License Amendment to Revise the Fuel Centerline Temperature Safety Limit for Byron and Braidwood Stations," dated September 21, 2001

In the referenced letter, we requested changes to Appendix A, Technical Specifications (TS), of Facility Operating License Nos. NPF-72, NPF-77, NPF-37 and NPF-66, for Braidwood Station, Units 1 and 2, and Byron Station, Units 1 and 2, respectively. The proposed change would revise the Reactor Core Safety Limit (SL) for peak fuel centerline temperature from less than or equal to 4700°F, (i.e., the current TS limit), to the design basis fuel centerline melt temperature of less than 5080°F, for unirradiated fuel, decreasing by 58°F per 10,000 Megawatt-Days per Metric Tonne Uranium (MWD/MTU) burnup.

In addition, the referenced letter requested NRC approval to increase the rod-average burnup licensing basis limit for high burnup Lead Test Assemblies (LTAs) from 60,000 MWD/MTU to approximately 69,000 MWD/MTU for Byron Station, Unit 2 Cycle 10 (i.e., B2C10) and up to 75,000 MWD/MTU for future LTA campaigns.

On January 14, 2002, a teleconference was held between members of the NRC and Exelon Generation Company (EGC) to discuss a number of technical issues related to the subject request. The NRC requested that EGC submit additional information to aid in their continued review of the license amendment request. This information is provided in Attachment A, "Response to Request for Additional Information."

In Attachment A-1, "Westinghouse Electric Company Reports," we are providing copies of the following reports:

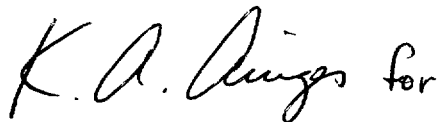
1. WCAP-14483-A, "Generic Methodology for Expanded Core Operating Limits Report," Westinghouse Electric Corporation, (Non-Proprietary), approved January 19, 1999.
2. WCAP-12610-P-A, "VANTAGE+ Fuel Assembly Reference Core Report," Westinghouse Electric Corporation, (Proprietary) approved April 1995.
3. WCAP-12488-A, "Westinghouse Fuel Criteria Evaluation Process," Westinghouse Electric Company, (Proprietary) approved July 27, 1994.

These reports were referenced in our September 21, 2001, submittal. WCAP 12610-P-A and WCAP 12488-A contain information proprietary to Westinghouse Electric Company; therefore, we are requesting that this information be withheld from public disclosure. Accordingly, an affidavit signed by Westinghouse Electric Company, LLC, a Delaware limited liability company and the owner of the information, is provided setting forth the basis on which the information may be withheld from public disclosure by the NRC and addressing the considerations listed in paragraph (b)(4) of 10 CFR 2.790, "Public inspections, exemptions, requests for withholding."

Also enclosed are a Westinghouse authorization letter, CAW-02-1508, Proprietary Information Notice and Copyright Notice.

Should you have any questions regarding this submittal, please contact Mr. J. A. Bauer at (630) 657-2801.

Respectfully,



K. R. Jury
Director – Licensing
Mid-West Regional Operating Group

Attachments: Attachment A, Response to Request for Additional Information
Attachment A-1, Westinghouse Electric Company Reports

cc: Regional Administrator – NRC Region III (w/o Attachment A-1)
NRC Senior Resident Inspector – Braidwood Station (w/o Attachment A-1)
NRC Senior Resident Inspector – Byron Station (w/o Attachment A-1)
Office of Nuclear Facility Safety – Illinois Department of Nuclear Safety
(w/o Attachment A-1)

ATTACHMENT A

Response to Request for Additional Information

On January 14, 2002, a teleconference was held between members of the NRC and Exelon Generation Company (EGC) to discuss a number of technical issues regarding a license amendment request discussed in a letter from T. W. Simpkin (EGC) to the NRC, "Request for a License Amendment to Revise the Fuel Centerline Temperature Safety Limit for Byron and Braidwood Stations," dated September 21, 2001. The NRC requested that EGC submit additional information to aid in their continued review of the license amendment request. This information is provided below.

NRC Request/Question 1

Describe the fuel duty that the four higher burnup rods have seen thus far. What type of duty will these rods see during the next cycle?

Response

There are currently four high burnup rods in Lead Test Assembly (LTA) M09E operating in Byron Station, Unit 2 Cycle 10 (i.e., B2C10). Although LTA M09E is in its second cycle, the four high burnup rods are in their third cycle of operation as they were extracted from a twice-burned assembly (i.e., L41E) and inserted into LTA M09E at the beginning of B2C10. The four rods in question are: rod E4, rod D5, rod G4, and rod M5. The burnup after the second cycle and the projected burnup after the third cycle (i.e., B2C10) for each rod is given in the below table.

Rod	Burnup (MWD/MTU) after 2 nd Cycle	Projected Burnup (MWD/MTU) after 3 rd Cycle
E4	46310	68603
D5	46204	66066
G4	45043	66249
M5	45507	65770

All four rods will be extracted from LTA M09E at the end of B2C10. There are currently no plans to use these rods in future fuel cycles.

The Fuel Duty Index (FDI) for the lead burnup rod (i.e., E4) after the second cycle was 331. The projected FDI after completion of the third cycle is 634. A plot of Cladding Corrosion Thickness vs. Fuel Duty Index for Zircaloy-4 and ZIRLO fuel is provided in Figure 1.

NRC Request/Question 2

Where is LTA M09E located in the core and is it in a "near limiting" core location?

Response

LTA M09E is located in core location E8. Figure 2-1 provides a reactor core map indicating the location of LTA M09E. Figures 3a, 3b, 3c, and 3d provide quarter core calculated assembly power and Enthalpy Rise Hot Channel Factor ($F^N\Delta H$) values for cycle burnups of 0 MWD/MTU,

ATTACHMENT A

Response to Request for Additional Information

4000 MWD/MTU, 12000 MWD/MTU, and 22000 MWD/MTU. These figures indicate that LTA M09E is not in a "near limiting" core location; however, the LTA is not on the core periphery and is experiencing approximately an average core power and $F_N\Delta H$. Note that there is a second LTA (i.e., LTA M12E) located in symmetric core location L8; however, this LTA does not contain any high burnup rods.

NRC Request/Question 3

What are the burnup plans for the other rods in LTA M09E; will they remain within the 60000 MWD/MTU burnup limit.

Response

Both LTA M09E and LTA M12E are in their second fuel cycle and will have an assembly average burnup of approximately 45000 MWD/MTU, with the exception of the four high burnup rods in LTA M09E, at the end of B2C10. Currently, we are considering using both LTAs in a future third fuel cycle, most probably in B1C13 starting in the Fall 2003, at the end of which all rods in each LTA are projected to have a burnup of approximately 69000 MWD/MTU.

NRC Request/Question 4

The license amendment request describes LTA characterizations that have been and will be performed after the assemblies and associated high burnup rods are discharged. These characterization results should be submitted to the NRC when available.

Response

The appropriate portions of the Westinghouse report, "Fuel Inspection Summary Report for Byron LTA Fuel Inspection Campaign," dated June 2001, will be forwarded to the NRC for informational purposes in the near future.

The results of the Post-Irradiation Examinations (PIE) that will be performed on LTA M09E, LTA M12E and the high burnup rods after B2C10 and after final discharge will also be sent to the NRC for information upon issuance.

NRC Request/Question 5

Describe the future PIE examinations that will be performed on the LTA assemblies and the high burnup rods.

Response

Future PIE examinations that will be performed on LTA M09E, LTA M12E and the high burnup rods will be consistent with the recommendations of Westinghouse Report, WCAP-15604-NP, "Limited Scope High Burnup Lead Test Assemblies," Revision 1. The current anticipated tests will include measurements such as rod peak crud-free oxidation, assembly length, assembly bow, profilometry, gamma scan, grid growth, grid oxide, guide thimble oxide, and grid cell size.

ATTACHMENT A

Response to Request for Additional Information

This WCAP is currently being reviewed by the NRC and approval is anticipated in the near future.

NRC Request/Question 6

Three Westinghouse reports were used as references in the license amendment request. Please provide a copy of these reports to the NRC.

Response

The following Westinghouse reports were referenced in our September 21, 2001, submittal:

4. WCAP-14483-A, "Generic Methodology for Expanded Core Operating Limits Report," Westinghouse Electric Corporation, approved January 19, 1999.
5. WCAP-12610-P-A, "VANTAGE+ Fuel Assembly Reference Core Report," Westinghouse Electric Corporation, approved April 1995.
6. WCAP-12488-A, "Westinghouse Fuel Criteria Evaluation Process," Westinghouse Electric Company, approved July 27, 1994.

Copies of these reports are provided in Attachment A-1, "Westinghouse Electric Company Reports."

Figure 1
Cladding Corrosion Thickness vs. Fuel Duty Index

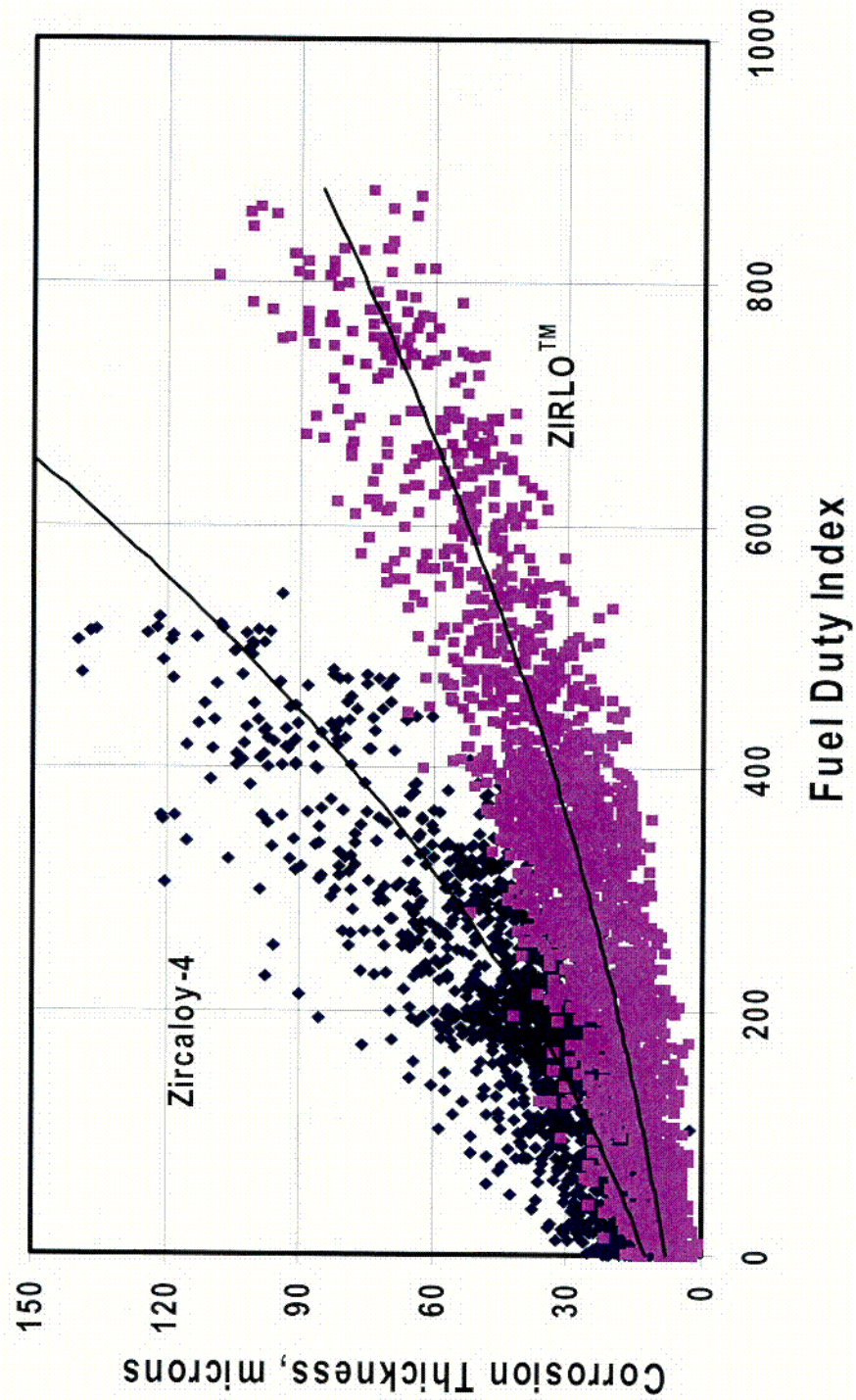
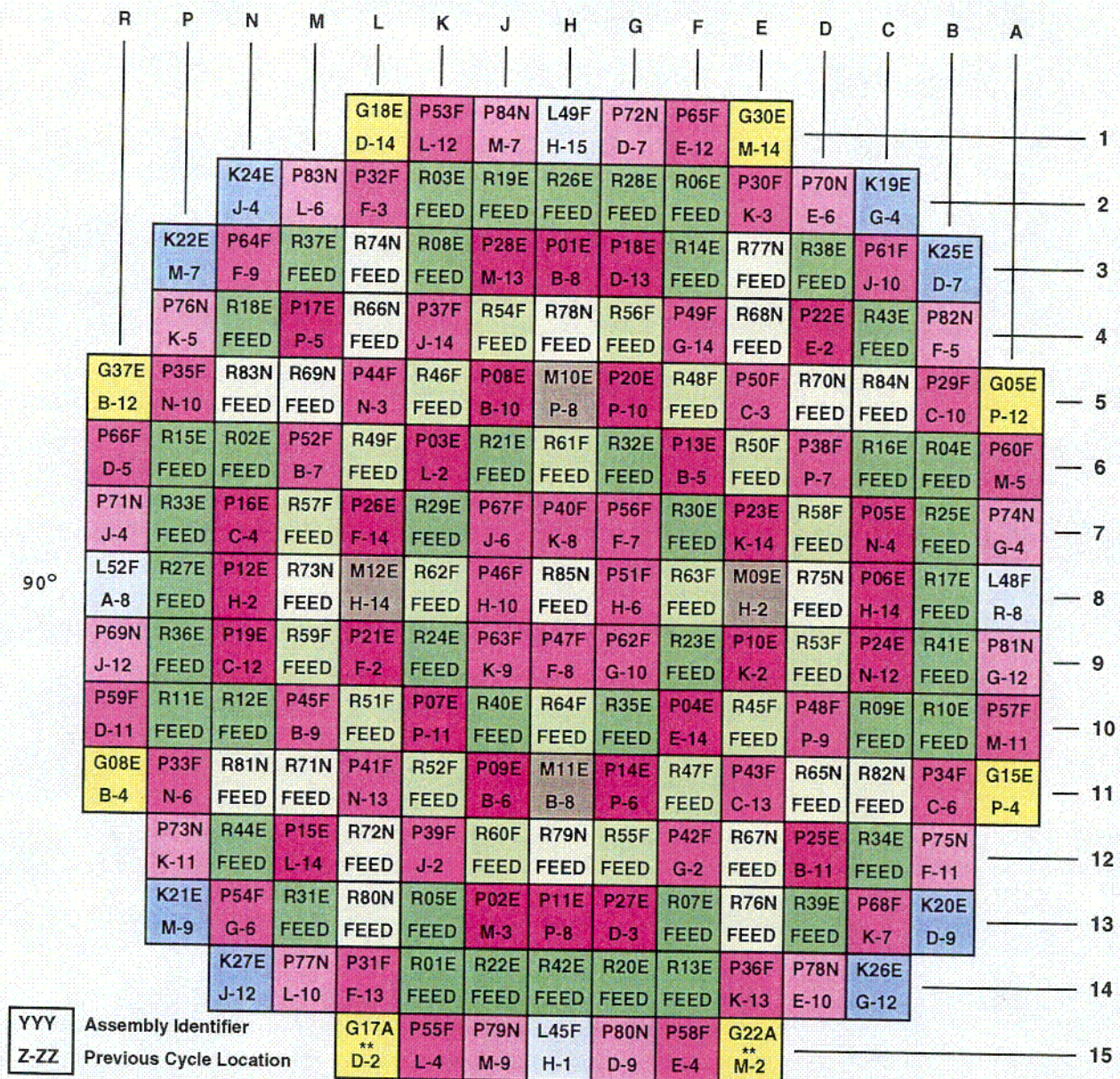


FIGURE 2-1
BYRON UNIT 2 CYCLE 10
REFERENCE CORE LOADING PATTERN

Rev. 1



* From Byron Unit 1

** 1.933 w/o Matching Assemblies from U1C10

G	REGION 7A *
(3.995 w/o)	
K.E	REGION 10A *
(4.411 w/o)	
P.E	REGION 11A
(4.796 w/o)	
P.F	REGION 11B
(4.595 w/o)	
P.N	REGION 11C
(4.396 w/o)	

L.F	REGION 11B *
(3.807 w/o)	
R.E	REGION 12A
(4.800 w/o)	
R.F	REGION 12B
(4.600 w/o)	
R.N	REGION 12C
(4.400 w/o)	
M.E	REGION 12A *
(4.589 w/o)	

C02

ATTACHMENT A-1

Westinghouse Electric Company Reports

1. WCAP-14483-A, "Generic Methodology for Expanded Core Operating Limits Report," Westinghouse Electric Corporation, approved January 19, 1999
2. WCAP-12610-P-A, "VANTAGE+ Fuel Assembly Reference Core Report," Westinghouse Electric Corporation, approved April 1995
3. WCAP-12488-A, "Westinghouse Fuel Criteria Evaluation Process," Westinghouse Electric Company, approved July 27, 1994

Other Enclosures:

- Westinghouse Authorization Letter, CAW-01-1508
- Proprietary Information Notice
- Copyright Notice
- Affidavit



**Westinghouse
Electric Company LLC**

Box 355
Pittsburgh Pennsylvania 15230-0355

January 28, 2002
CAW-02-1508

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

Attention: J. S. Wermiel, Chief,
Reactor Systems Branch
Division of Systems Safety and Analysis

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject: Transmittal of Westinghouse Proprietary Topicals in Support of "Response to Request for Additional Information Regarding a Previous License Amendment Request to Revise the Fuel Centerline Temperature Safety Limit for Byron and Braidwood Stations"

Dear Mr. Wermiel:

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-02-1508 signed by the owner of the proprietary information, Westinghouse Electric Company LLC, a Delaware limited liability company ("Westinghouse"). 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 authorized the utilization of the accompanying Affidavit by Exelon Generation Company.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-02-1508, and should be addressed to the undersigned.

Very truly yours,

Henry A. Sepp, Manager
Regulatory and Licensing Engineering

Proprietary Information Notice

Transmitted herewith are proprietary and non-proprietary versions of documents furnished to the NRC. 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) 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 documents transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies for 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 these 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.

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

SS

COUNTY OF ALLEGHENY:

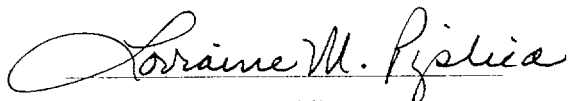
Before me, the undersigned authority, personally appeared Henry A. Sepp, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC, a Delaware limited liability company ("Westinghouse") and that the averments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



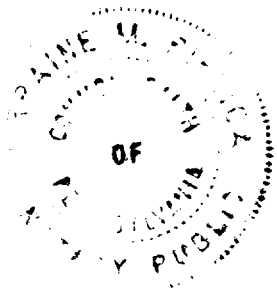
Henry A. Sepp, Manager

Regulatory and Licensing Engineering

Sworn to and subscribed
before me this 28th day
of January, 2002.



Notary Public



Notarial Seal
Lorraine M. Piplica, Notary Public
Monroeville Boro, Allegheny County
My Commission Expires Dec. 14, 2003
Member, Pennsylvania Association of Notaries

- (1) I am Manager, Regulatory and Licensing Engineering, in Nuclear Services, of the Westinghouse Electric Company LLC, a Delaware limited liability company ("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 the Westinghouse Electric Company.
- (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 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 "Transmittal of Westinghouse Proprietary Topicals in Support of 'Response to Request for Additional Information Regarding a Previous License Amendment Request to Revise the Fuel Centerline Temperature Safety Limit for Byron and Braidwood Stations'," for information in support of Byron Units 1 and 2 and Braidwood Units 1 and 2 Technical Specifications licensing amendment change submittal to the Commission, transmitted via Exelon Generation Company letter and Application for Withholding Proprietary Information from Public Disclosure, H. A. Sepp, Westinghouse, Manager Regulatory and Licensing Engineering to the attention of J. S. Wermiel, Chief, Reactor Systems Branch, Division of Systems Safety and Analysis. The proprietary information, transmittal of new copies of WCAP-12610-P-A (Proprietary) and WCAP-12488-A (Proprietary) in support of RAI Number 6, was provided by Westinghouse Electric Company.

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

- (a) Provide technical details on ZIRLO™ in support of Exelon Generation Company's submittal.
- (b) Assist customers to obtain license changes.

Further this information has substantial commercial value as follows:

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

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 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 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 the enclosed improved core thermal performance methodology.

Further the deponent sayeth not.