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18 December, 2002
LTR-NRC-02-66

Project No. 700

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

SUBJECT: FINAL MEETING PRESENTATION MATERIAL FOR IMPLEMENTATION OF ZrB₂ IFBA IN CE FUEL DESIGNS


[Enclosure 1-P Contains Westinghouse Proprietary Class 2 Material]

By this letter, Westinghouse Electric Company LLC (Westinghouse) is providing final presentation material regarding implementation of ZrB₂ burnable absorber in CE fuel designs. This information is for Nuclear Regulatory Commission (NRC) use in support of a meeting scheduled for Wednesday, December 18, 2002.

Westinghouse has determined that the information contained in Enclosure 1-P is proprietary in nature. Consequently, it is requested that this information be withheld from public disclosure in accordance with the provisions of 10 CFR 2.790 and that copies of this information be appropriately safeguarded. The reasons for the classification of this information as proprietary are delineated in the affidavit provided in Enclosure 2. A non-proprietary version of the presentation material is provided in Enclosure 3.

If you have any questions regarding this matter, please do not hesitate to call me or Chuck Molnar of Westinghouse's Licensing staff at (860) 731-6286.

Very truly yours,


for Donald M. Rowland
Manager, Fuel Licensing & Special Projects
Westinghouse Electric Co. LLC

Enclosure(s): As stated

xc: R. Caruso (NRC, w/enclosures)
G. S. Shukla (NRC, w/enclosures)

9054

WESTINGHOUSE ELECTRIC COMPANY LLC

PROPRIETARY AFFIDAVIT

FOR

**FINAL MEETING PRESENTATION MATERIAL
FOR IMPLEMENTATION OF ZrB_2 IFBA IN CE**

Proprietary Affidavit

I, Ian. C. Rickard, depose and say that I am the Licensing Project Manager, Windsor Nuclear Licensing, of Westinghouse Electric Company LLC (WEC), duly authorized to make this affidavit, and have reviewed or caused to have reviewed the information which is identified as proprietary and described below.

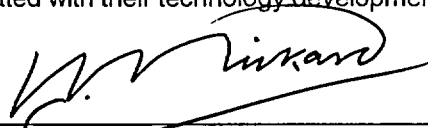
I am submitting this affidavit in conformance with the provisions of 10 CFR 2.790 of the Commission's regulations for withholding this information. I have personal knowledge of the criteria and procedures utilized by WEC in designating information as a trade secret, privileged, or as confidential commercial or financial information.

The information for which proprietary treatment is sought, and which documents have been appropriately designated as proprietary, is contained in the following:

Enclosure 1-P to LTR-NRC-02-66, "Final Meeting Presentation Material for Implementation of ZrB₂ IFBA in CE Fuel Designs", December, 2002

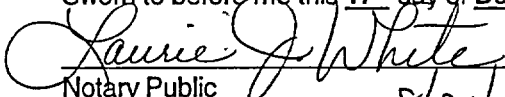
Pursuant to the provisions of Section 2.790(b)(4) of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information included in the documents listed above should be withheld from public disclosure.

- i. The information sought to be withheld from public disclosure is owned and has been held in confidence by WEC. It consists of information concerning implementation of ZrB₂ burnable absorber in CE fuel designs and the safety analysis methodologies for the evaluation of such fuel design.
- ii. The information consists of test data or other similar data for the design, development and implementation of ZrB₂ burnable absorber in CE fuel designs and the safety analysis methodologies for the evaluation of such fuel design, the application of which results in substantial competitive advantage to WEC.
- iii. The information is of a type customarily held in confidence by WEC and not customarily disclosed to the public.
- iv. The information is being transmitted to the Commission in confidence under the provisions of 10 CFR 2.790 with the understanding that it is to be received in confidence by the Commission.
- v. The information, to the best of my knowledge and belief, is not available in public sources, and any disclosure to third parties has been made pursuant to regulatory provisions or proprietary agreements that provide for maintenance of the information in confidence.
- vi. Public disclosure of the information is likely to cause substantial harm to the competitive position of WEC because:
 - a. A similar product is manufactured and sold by major competitors of WEC.
 - b. WEC invested substantial funds and engineering resources in the development of this information. A competitor would have to undergo similar expense in generating equivalent information.
 - c. The information consists of implementation of ZrB₂ burnable absorber in CE fuel designs and the safety analysis methodologies for the evaluation of such fuel design, the application of which provides a competitive economic advantage. The availability of such information to competitors would enable them to design their product to better compete with WEC, take marketing or other actions to improve their product's position or impair the position of WEC's product, and avoid developing similar technical analysis in support of their processes, methods or apparatus.
 - d. In pricing WEC's products and services, significant research, development, engineering, analytical, manufacturing, licensing, quality assurance and other costs and expenses must be included. The ability of WEC's competitors to utilize such information without similar expenditure of resources may enable them to sell at prices reflecting significantly lower costs.
 - e. Use of the information by competitors in the international marketplace would increase their ability to market a competing product, reducing the costs associated with their technology development.



Ian. C. Rickard
Licensing Project Manager
Westinghouse Electric Company LLC

Sworn to before me this 17th day of December, 2002



Notary Public
My commission expires: 8/31/04

Westinghouse Non-Proprietary Class 3

Enclosure 3 to LTR-NRC-02-66

WESTINGHOUSE ELECTRIC COMPANY LLC

**FINAL NON-PROPRIETARY MEETING
PRESENTATION MATERIAL FOR
IMPLEMENTATION OF ZrB_2 IFBA IN CE FUEL**

DECEMBER, 2002

Westinghouse Electric Company, LLC

ZrB₂ Implementation in CE Fuel Designs

Zeses Karoutas / Ivan Fiero

December 18, 2002

ZrB₂ Implementation in CE Fuel Designs

Agenda

- Background on Westinghouse ZrB₂ IFBA Experience
- Impact of ZrB₂ IFBA on Irradiation Performance
- ZrB₂ IFBA Implementation in CE Design and Licensing
- Conclusions
- Topical Report Outline
- Schedule
- NRC Comments/Feedback

ZrB₂ Implementation in CE Fuel Designs

- **Background on Westinghouse ZrB₂ IFBA Experience**

- Purpose and Scope of Meeting Agenda

- Present a summary of IFBA topical report content and format
- Summarize scope of design and licensing methods modifications expected
- Discuss implementation schedule
- Obtain NRC feedback

- Benefits of ZrB₂ IFBA in CE Fuel Designs

- Supports product integration
- [

]

ZrB₂ Implementation in CE Fuel Designs

- **Background on Westinghouse ZrB₂ IFBA Experience**

- Westinghouse/CE Integration Plans

- Product integration is consistent and concomitant with ongoing efforts toward software and methods integration
- ZrB₂ IFBA fuel performance models and properties for CE PWRs []
- ZrB₂ IFBA is currently the main burnable absorber used in Westinghouse PWRs
- Several CE PWR owners have expressed interest in implementation of ZrB₂ IFBAs
- Initial implementation would use []

]

- Westinghouse Experience

- Current Westinghouse production of ZrB₂ IFBA rods is about [] per year
- No fuel failures are associated with the IFBA coating
- ZrB₂ IFBA rods already successfully used in several reloads of a CE PWR, Ft. Calhoun

ZrB₂ Implementation in CE Fuel Designs

- **Impact of ZrB₂ IFBA on Irradiation Performance**

- Neutronics

- Physics parameters and core responses are similar to erbia

- Fuel Performance

- [

- Fuel rod design accommodates [

]

- Initial condition parameters transmitted to fuel mechanical design and transient/accident analyses remain the same, [

- [

]

]

ZrB₂ Implementation in CE Fuel Designs

- ZrB₂ IFBA Implementation in CE Design and Licensing

- Models and Properties

- Models and properties will be []

- Code Modifications

- ZrB₂ IFBA modifications []
 - ZrB₂ IFBA coating thickness []
 - []
 - FATES3B []
 - []
 - []
 - []

ZrB₂ Implementation in CE Fuel Designs

- **ZrB₂ IFBA Implementation in CE Design and Licensing**

- Benchmarking and Verification

- Westinghouse and CE physics codes benchmarked to IFBA core operating data
- Physics integration lead code integration project
- [

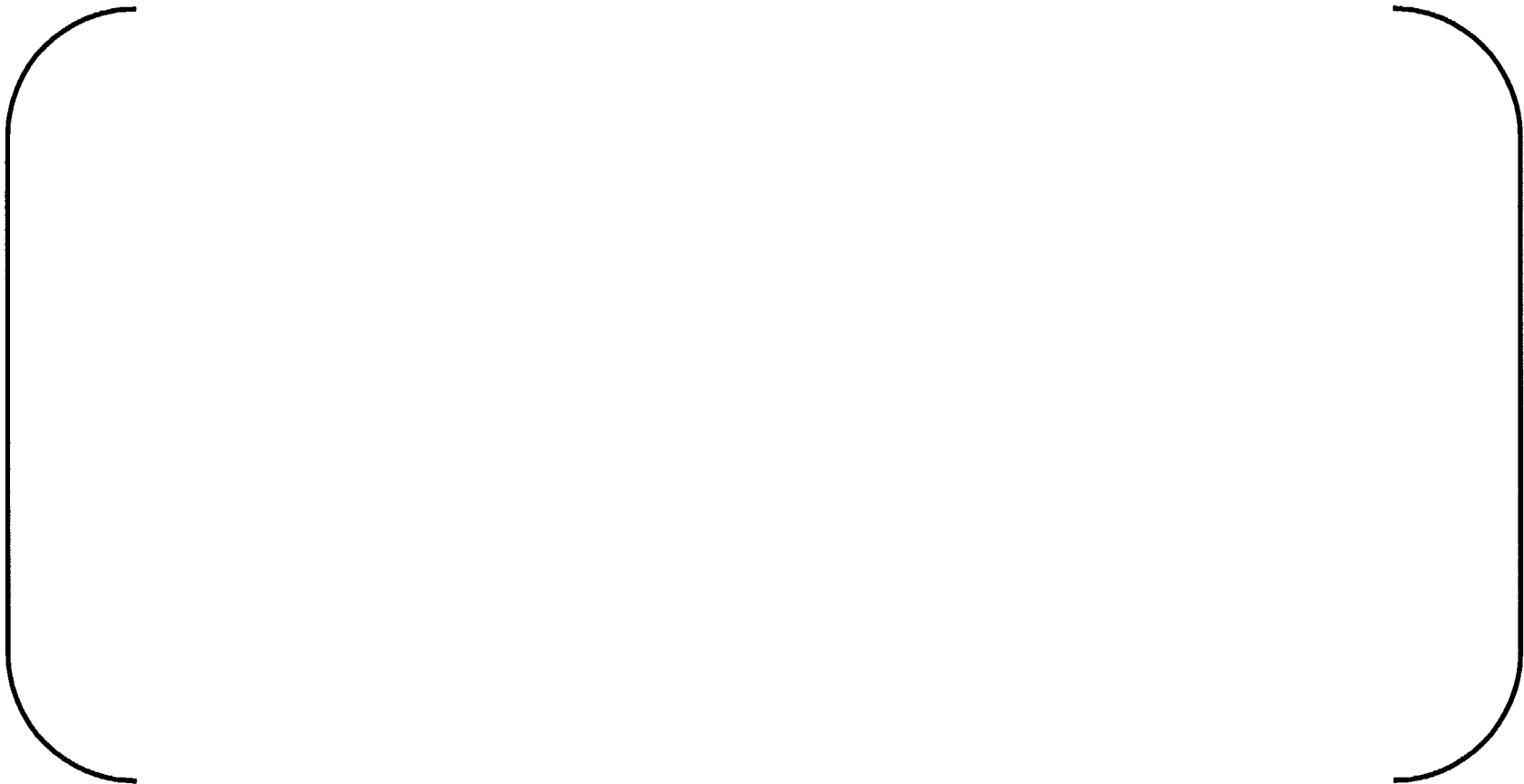
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- Approved Topical Reports Affected

- Approved topical reports will be reviewed and those affected by ZrB₂ IFBA are to be identified
- Expect stand alone topical similar to erbia and gadolinia topical reports

ZrB₂ Implementation in CE Fuel Designs

- Fuel Performance IFBA Benchmark



ZrB₂ Implementation in CE Fuel Designs

- ZrB₂ IFBA Implementation in CE Design and Licensing

- Fuel Performance Design and Licensing Impact

- []
- []
- Smaller [] will have very minor impact on temperature and pressure
- []
- Maximum helium release currently []
- A possible update for helium release []
- Minimum helium release []

ZrB₂ Implementation in CE Fuel Designs

- Maximum Pressure



ZrB₂ Implementation in CE Fuel Designs

- Maximum Average Temperature



ZrB₂ Implementation in CE Fuel Designs

- ZrB₂ IFBA Implementation in CE Design and Licensing

- Fuel Mechanical Design and Licensing Impact

- Incorporation of ZrB₂ IFBA in the fuel rod design will be evaluated in the areas of []
 - []
 - []
 - It is anticipated that design analysis will demonstrate the acceptability of []

ZrB₂ Implementation in CE Fuel Designs

ECCS Performance (LBLOCA - 1999 EM & SBLOCA - S2M)

- []
 - Evaluation model survey will disposition all impacts in the methodology basis
 - Evaluation model survey will demonstrate []
 - []
- A generic special study []

ZrB₂ Implementation in CE Fuel Designs

ECCS Performance (LBLOCA - 1999 EM & SBLOCA - S2M), continued

- Impact of ZrB₂ is Represented in the Standard Plant Specific ECCS Performance Analysis Process with []
 - Fuel performance impact is analyzed through the link to FATES3B and other standard fuel specific computer model inputs
 - []
 - Physics impact is analyzed through standard physics related code inputs []
 - []
 - Demonstration analyses expected to show []
- Topical Report Content Expected to be []

ZrB₂ Implementation in CE Fuel Designs

- **ZrB₂ IFBA Implementation in CE Design and Licensing**

- Non-LOCA Accidents Design and Licensing Impact

- Expect []
- Changes to physics due to ZrB₂ normal input data []
- Physics data changes are addressed, as would be normal cycle-to-cycle variations to physics data, during reload process
- []
- [] due to FATES3B file inputs]
- []
- []
- Topical report content expected to be []

ZrB₂ Implementation in CE Fuel Designs

- ZrB₂ IFBA Implementation in CE Design and Licensing

- Nuclear Design and Licensing Impact

- Neutronic models []
- Initial implementation analysis of ZrB₂ in CE PWRs may employ []
- [] on CE PWRs
- []
- [] on all PWRs and has been used to perform design analysis for many cores containing ZrB₂ IFBA

ZrB₂ Implementation in CE Fuel Designs

- ZrB₂ IFBA Implementation in CE Design and Licensing

- Nuclear Design and Licensing Impact

- Safety Analysis methodology [

- [] for downstream analysis
- [] in the current CE reload process
- []

- Westinghouse has determined that the [] should result in a negative 50.59 impact
- []

]

ZrB₂ Implementation in CE Fuel Designs

- **Conclusions**

- Considerable Westinghouse Experience Exists with ZrB₂ IFBA in Westinghouse PWRs and in Several Reloads in Ft. Calhoun (CE PWR)
- No Technical Issues Associated with Introduction of ZrB₂ IFBA into CE PWRs
- []
- FATES3B []
- Impact on Design and Licensing Expected []
- ZrB₂ IFBA Topical Report Similar to Erbium and Gadolinium Topical Reports

ZrB₂ Implementation in CE Fuel Designs

- **Topical Report (Table of Contents)**

- Introduction**

- Purpose and Scope

- Background**

- Benefits of ZrB₂ IFBA

- Westinghouse ZrB₂ IFBA Experience

- ZrB₂ IFBA Implementation in CE Design and Licensing**

- Models and Properties

- Code Modifications

- Benchmarking and Verification

- Neutronics

- Fuel Performance

- Approved Topical Reports Affected

- Design and Licensing Impact**

- Fuel Performance

- Fuel Mechanical Design

- ECCS Evaluations

- Non-LOCA Accidents

- Nuclear Design

- Conclusions**

ZrB₂ Implementation in CE Fuel Designs

SUMMARY

- Westinghouse ZrB₂ IFBA Experience Extensive in Westinghouse PWRs
- Westinghouse ZrB₂ IFBA Experience in CE PWR Ft. Calhoun
- No Technical Issues Associated with Introduction of ZrB₂ IFBA into CE PWRs (Directly Transportable)
- []
- Expect Simple and Relatively Brief Topical Report

ZrB₂ Implementation in CE Fuel Designs

- **Proposed Schedule**

–Preview meeting with NRC:	December 18, 2002	
–Submittal of topical report:	April 2003	
–NRC review complete:	December 2003	
–Reload implementation:	Calvert Cliffs 2 Cycle 16	
	Begin Design Analysis	January 2004
	Begin Fuel Fabrication	September 2004
	Plant Start-Up	April 2005

ZrB₂ Implementation in CE Fuel Designs

- **NRC Comments/Feedback**
–What do you think?

