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U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555-0001

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

Our ref: LTR-NRC-05-16

March 22, 2005

Subject: Final Slide Presentation for the "Next Generation Fuel Pre-Submittal Meeting" (Proprietary/Non-Proprietary)

Dear Mr. Wermiel:

Enclosed is a copy of the Proprietary/Non-Proprietary version of final slide presentation for the Next Generation Fuel Pre-Submittal Meeting.

Also enclosed is:

1. One (1) copy of the Application for Withholding, AW-05-1970 (Non-proprietary) with Proprietary Information Notice.
2. One (1) copy of Affidavit (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.

Correspondence with respect to this affidavit or Application for Withholding should reference AW-05-1970 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', written over a horizontal line.

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

Enclosures

cc: B. Benney, NRR  
F. Akstulewicz, NRR  
L. M. Feizollahi, NRR



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March 22, 2005

APPLICATION FOR WITHHOLDING PROPRIETARY  
INFORMATION FROM PUBLIC DISCLOSURE

**Subject:** Final Slide Presentation for the "Next Generation Fuel Pre-Submittal Meeting" (Proprietary)  
**Reference:** Letter from J. A. Gresham (Westinghouse) to J. S. Wermiel (NRC), "Final Slide Presentation for the Next Generation Fuel Pre-Submittal Meeting" (Proprietary/Non-Proprietary), dated March 22, 2005

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 subject report. In conformance with 10 CFR Section 2.390, Affidavit AW-05-1970 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-05-1970 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, NRR  
F. Akstulewicz, NRR  
L. M. Feizollahi, NRR

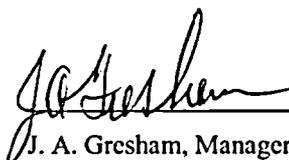
AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF ALLEGHENY:

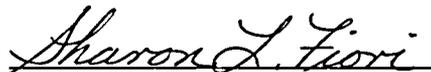
Before me, the undersigned authority, personally appeared J. A. Gresham, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit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

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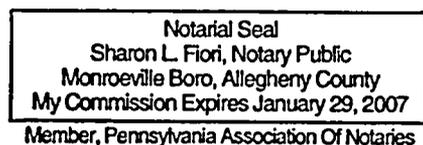
J. A. Gresham, Manager  
Regulatory Compliance and Plant Licensing

Sworn to and subscribed

before me this 22<sup>nd</sup> day  
of March, 2005



Notary Public



- (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.

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 "Final Slide Presentation for the Next Generation Fuel Pre-Submittal Meeting" (Proprietary), for submittal to the Commission, being transmitted by Westinghouse letter (LTR-NRC-05-16) and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse Electric Company is that associated with an NRC pre-submittal meeting.

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

- (a) License Next Generation Fuel.
- (b) Promote convergence between Westinghouse business units.

Further this information has substantial commercial value as follows:

- (a) Westinghouse can use the fuel design to further enhance their licensing position over their competitors.
- (b) Assist customers (licensees) to obtain license changes.

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/design 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.

Westinghouse Non-Proprietary Class 3



**Westinghouse**

A BNFL Group company

# Next Generation Fuel Pre-Submittal Meeting

NRC Meeting  
One White Flint  
March 24, 2005

# Agenda

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## Objective

### Brief Overview of Assembly Design

- NGF Assembly Design Features
- NGF Fuel Rod Features
- Feature Pedigree
- Mid-grid/IFM Design
- Structural Capability Enhancement

### Licensing Submittal

- NGF Topical Report
- What is the basis for the Topical Report
- Proposed Table of Content
- Models and Methodology
- Plant Application

## Schedule

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# Objectives

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- Discuss the submittal of the NGF topical report to the NRC for review and approval
- To provide a brief overview of the design and associated features
- Discuss the licensing approach and what will be addressed
- Discuss the proposed schedule for submission, review and approval

# Brief Overview of Assembly Design

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# NGF Assembly Design Features

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# NGF Fuel Rod Features



# Feature Pedigree

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Features	Licensing Pedigree or Planned Licensing Approach
WIN	Licensed via FCEP; LTR-NRC-04-23, 4/19/2004
Tube-in-Tube Guide Thimble Tube	Licensed via FCEP, LTR-NRC-01-44, 12/19/01
Mid-Grids <ul style="list-style-type: none"><li>• I-spring Mid-grid</li><li>• Modified Vanes</li><li>• IFMs (number)</li></ul>	<ul style="list-style-type: none"><li>• Collectively these changes can not be FCEP</li><li>• Confirmatory Region application DNB tests completed by 2Q03</li><li>• I-spring design was based on the CE 14x14 Turbo grid</li><li>• Vane design comparable to that for RFA/RFA-2</li></ul>
Fuel Rod Spring Clip	<ul style="list-style-type: none"><li>• Licensed via WCAP-12610-P-A</li></ul>

# Mid-grid/IFM Design

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# Structural Capability Enhanced

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# Licensing Submittal

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# NGF Topical Report

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- What is the basis for the topical report
- Proposed Table of Content
- Models and Methodology
- Plant Application

The 17x17 NGF topical report is structured to address all of the design criteria recommended in the Standard Review Plan 4.2 (Fuel Design). The regulatory impact of most of the enhancements being incorporated into the 17x17 NGF are minor and have been addressed in previous licensed design changes. The key design enhancement is the new mid-grid/IFM design being used in the 17x17 NGF. The areas of focus for this topical are the DNB & LOCA aspects of the design including transition core effects (specifics of correlation addressed in a separate topical), seismic/LOCA and a check of the combined component effects.

# What is the basis for the topical report

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## 17x17 Next Generation Fuel (NGF) Topical Report Requirements

### SRP 4.2, II. Acceptance Criteria:

- Specific criteria necessary to meet the requirements of 10 CFR Part 50, 50.46; General Design Criteria 10, 27, and 35; Appendix K to 10 CFR Part 50; and 10 CFR Part 100 identified in subsection I of this SRP.
- "To meet the requirements of General Design Criterion 10 as it relates to Specified Acceptable Fuel Design Limits for normal operation, including anticipated operational occurrences, fuel system damage criteria should be given for all known damage mechanisms. Fuel system damage includes fuel rod failure, which is discussed below in subsection II.A.2. In addition to precluding fuel rod failure, fuel damage criteria should assure that fuel system dimensions remain within operational tolerances and that functional capabilities are not reduced below those assumed in the safety analysis. Such damage criteria should address the following to be complete."

# What is the basis for the topical report

	SRP Subsection	Topical Report Section
Design Basis Fuel System Damage	II.A.1.(a) - Stress, Strain or Loading Limits on grids, GT, fuel rods, control rods & other fuel system structural members	2.2.1.3, 2.2.1.4, 2.2.1.5, 2.3.1, 2.3.2, 2.3.4, 2.3.5, 2.4.2
	II.A.1.(b) - Strain Fatigue	2.2.1.3, 2.4.6
	II.A.1.(c) - Fretting Wear	2.2.1.3, 2.4.5
	II.A.1.(d) - Oxidation, Hydriding and Crud	2.2.1.3, 2.3.1, 2.3.2, 2.3.4, 2.3.5, 2.4.3
	II.A.1.(e) - Dimensional Growth, Rod Bow, Irradiation Growth	2.2.1.1, 2.3.3, 2.3.4, 2.4.8
	II.A.1.(f) - Rod/BA Internal Gas Pressure	2.4.1, 2.4.9, 2.4.10
	II.A.1.(g) - Holddown Forces	2.2.1.2, 2.3.3
	II.A.1.(h) - Control Rod Reactivity	N/A
Design Basis Fuel Rod Failure	II.A.2.(a) - Hydriding	2.4.3
	II.A.2.(b) - Cladding Collapse	2.4.7
	II.A.2.(c) - Fretting	2.4.5
	II.A.2.(d) - Clad Overheating	2.4.3, 2.4.4
	II.A.2.(e) - Pellet Overheating	2.4.4, 2.4.9, 2.4.10
	II.A.2.(f) - Excessive Fuel Enthalpy	2.4.4, 3.0, 5.1
	II.A.2.(g) - PCI	2.4.2
	II.A.2.(h) - Burst	2.4.3, 2.4.4, 2.4.9, 5.2
	II.A.2.(i) - Mechanical Fracturing	2.4.1, 2.4.2, 2.4.3

# What is the basis for the topical report

	SRP Subsection	Topical Report Section
<b>Design Basis Fuel Coolability</b>	II.A.3.(a) - Cladding Embrittlement	2.4.1, 2.4.3, 5.2
	II.A.3.(b) - Violent Expulsion of Fuel	2.4.4, 3.0, 5.1
	II.A.3.(c) - Clad Melting	2.4.4, 5.2
	II.A.3.(d) - Fuel Rod Ballooning	2.4.1, 2.4.4, 5.2
	II.A.3.(e) - Structural Deformation (Seismic/LOCA)	2.2, 2.3
<b>Description &amp; Design</b>	II.B	2.1
<b>Design Evaluation</b>	II.C.1 - Operating Experience	2.3.6
	II.C.2 - Prototype (LTA) Experience	2.3.6
	II.C.3 - Analytical Predictions	3.0 thru 7.0
<b>Testing, Inspection &amp; Surveillance Plans</b>	II.D - Test, Inspections, Surveillance	

# Proposed Table of Content

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	a, c
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# Models and Methodology / Plant Application

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- [

] a,c

- The reference core report will show what analyses need to be completed to demonstrate acceptability of the fuel design for implementation by a licensee

- [

] a,c

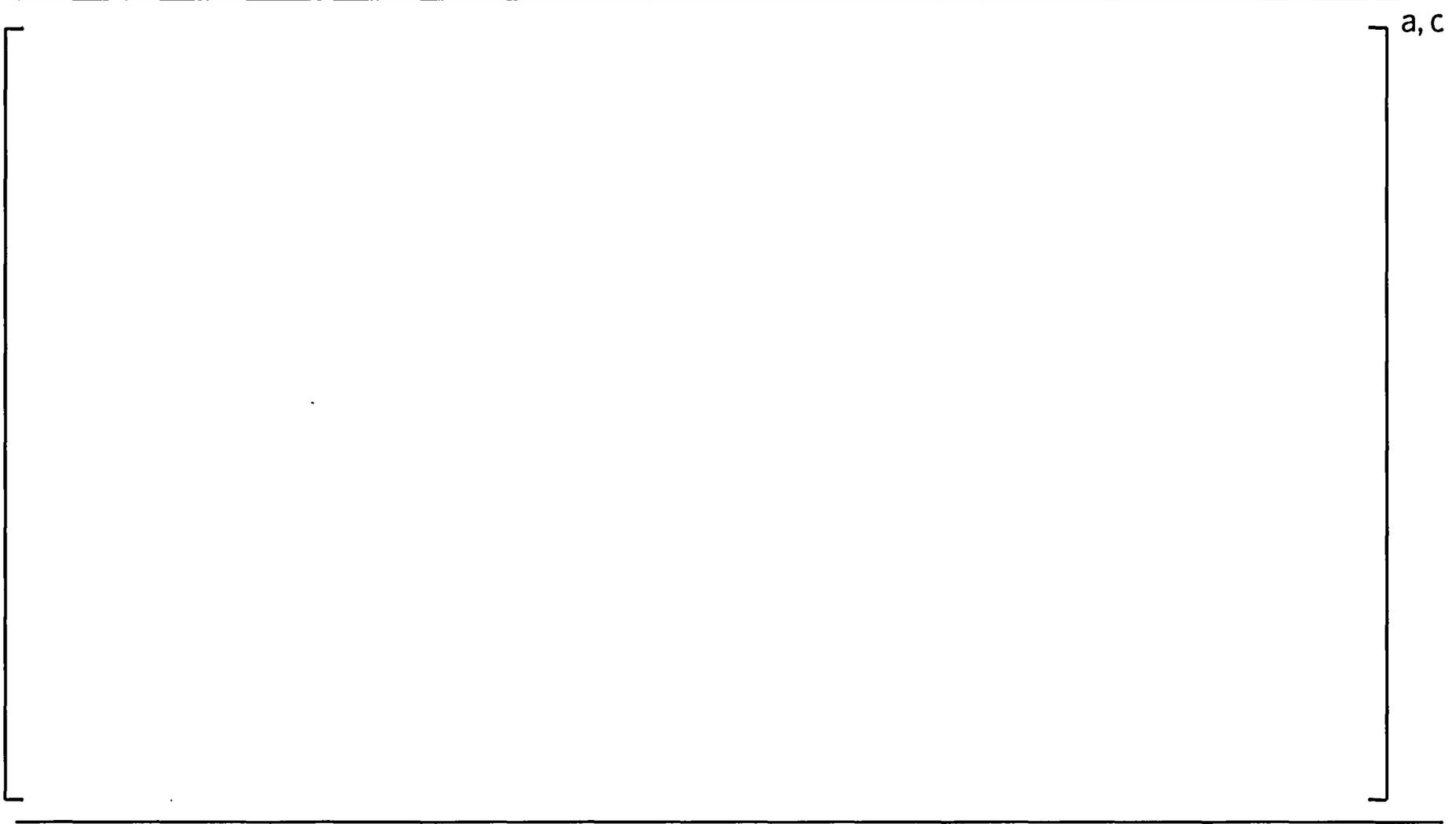
- Further, thermal margin may be added by applying advanced analytical techniques, [  
] a,c

# Schedule

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# Schedule

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# Westinghouse

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