

Attachment 14

**Westinghouse Electric Company non-proprietary document EQ-EV-62-WBT-NP,
“Comparison of Tested Conditions for the AI687 and AI688 Common Q Modules to the
Watts Bar Unit 2 (WBT) Requirements,” Revision 1 (non-proprietary) (Letter Item 5)**



Westinghouse Non-Proprietary Class 3

TVA/WBT AI687 and AI688

Comparison of Tested Conditions for the AI687 and AI688 Common Q Modules to the Watts Bar Unit 2 (WBT) Requirements

EQ-EV-62-WBT-NP
Rev. 1

November 2011

APPROVALS

Function	Name and Signature
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*Electronically approved records are authenticated in the electronic document management system.

WESTINGHOUSE NON-PROPRIETARY CLASS 3

REVISION HISTORY

RECORD OF CHANGES

Revision	Author	Description	Completed
0	Stanley G. Cheyne	Original Issue	September 2010
1	Stanley G. Cheyne	Revision to [] ^{a,c} . Added Reference 13, updated References 2 and 3, Sections 3.2 and 5.2, Tables 3.2-1 and 5.2-1.	October 2010
1 NP	Natalie R. Jurcevich	Revision 1 with proprietary content removed.	See EDMS

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TABLE OF CONTENTS

Section	Title	Page
	REVISION HISTORY	i
	TABLE OF CONTENTS.....	ii
	LIST OF TABLES.....	iii
	LIST OF FIGURES	iii
	REFERENCES	v
SECTION 1	INTRODUCTION AND BACKGROUND	1-1
SECTION 2	EQUIPMENT IDENTIFICATION	2-1
SECTION 3	WATTS BAR UNIT 2 QUALIFICATION REQUIREMENTS	3-1
3.1	SEISMIC.....	3-1
3.2	ENVIRONMENTAL.....	3-13
SECTION 4	QUALIFICATION TEST CONDITIONS	4-1
4.1	SEISMIC TEST	4-1
4.1.1	Equipment Under Test.....	4-1
4.1.2	Seismic Test Levels	4-1
4.2	ENVIRONMENTAL TEST	4-11
4.2.1	Equipment Under Test.....	4-11
4.2.2	Environmental Conditions	4-11
SECTION 5	COMPARISON OF WBT REQUIREMENTS AND TEST CONDITIONS	5-1
5.1	SEISMIC COMPARISON.....	5-1
5.2	ENVIRONMENTAL COMPARISON.....	5-8
SECTION 6	SUMMARY AND CONCLUSIONS	6-1

LIST OF TABLES

Table	Title	Page
Table 2.1-1.	EUT Identification.....	2-1
Table 3.2-1. [	] ^{a,c} Environmental Conditions.....	3-13
Table 5.2-1. [	] ^{a,b,c}	5-8

LIST OF FIGURES

Figure	Title	Page
Figure 3.1-1. [	] ^{a,c}	3-2
Figure 3.1-2. [	] ^{a,c}	3-3
Figure 3.1-3. [	] ^{a,c}	3-4
Figure 3.1-4. [	] ^{a,c}	3-5
Figure 3.1-5. [	] ^{a,c}	3-6
Figure 3.1-6. [	] ^{a,c}	3-7
Figure 3.1-7. [	] ^{a,c}	3-8
Figure 3.1-8. [	] ^{a,b,c}	3-9
Figure 3.1-9. [	] ^{a,b,c}	3-10
Figure 3.1-10. [	] ^{a,b,c}	3-11
Figure 3.1-11. [	] ^{a,b,c}	3-12
Figure 4.1-1. [	] ^{a,b,c}	4-2
Figure 4.1-2. [	] ^{a,b,c}	4-3
Figure 4.1-3. [	] ^{a,b,c}	4-4
Figure 4.1-4. [	] ^{a,b,c}	4-5
Figure 4.1-5. [	] ^{a,b,c}	4-6
Figure 4.1-6. [	] ^{a,b,c}	4-7
Figure 4.1-7. [	] ^{a,b,c}	4-8

Figure 4.1-8. [	]	^{a,b,c}	4-9
Figure 4.1-9. [	]	^{a,b,c}	4-10
Figure 4.2-1. [	]	^{a,c}	4-12
Figure 4.2-2. [	]	^{a,b,c}	4-13
Figure 5.1-1. [	]	^{a,b,c}	5-2
Figure 5.1-2. [	]	^{a,b,c}	5-3
Figure 5.1-3. [	]	^{a,b,c}	5-4
Figure 5.1-4. [	]	^{ab,,c}	5-5
Figure 5.1-5. [	]	^{a,b,c}	5-6
Figure 5.1-6. [	]	^{a,b,c}	5-7

REFERENCES

Following is a list of references used throughout this document.

1. []^{a,c}
2. []^{a,c}
3. []^{a,c}
4. []^{a,c}
5. []^{a,c}
6. []^{a,c}
7. []^{a,c}
8. []^{a,c}
9. []^{a,c}
10. IEEE Std 344-1987, "IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations," Institute of Electrical and Electronics Engineers, Inc.
11. IEEE Std 323-1983, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations," Institute of Electrical and Electronics Engineers, Inc.
12. []^{a,c}

REFERENCES (cont.)

13. [

] ^{a,c}

SECTION 1 INTRODUCTION AND BACKGROUND

To support the equipment qualification of the Watts Bar Unit 2 (WBT) Post Accident Monitoring System (PAMS) a separate qualification program was performed for two Common Qualified (Common Q™) Analog Input (AI) modules used in the PAMS cabinet. The AI687 and AI688 modules are []^{a,c} for use as high speed analog input applications.

The AI687 and AI688 modules were subjected to a test sequence which included Electromagnetic Interference / Electromagnetic Compatibility (EMI/EMC) testing, mild environment testing, and seismic qualification testing. These three separate sequences were performed for generic applications. This document compares the tested seismic and environmental conditions to the requirements of the WBT PAMS application. []^{a,c}, EMI/EMC testing of the AI687 and AI688 modules was performed on a generic basis, and no comparison to specific WBT requirements is provided.

It is not the intent of this evaluation to document the qualification of the AI687 and AI688 modules. Equipment Qualification Summary Report, []^{a,c} provides the details of the AI687 and AI688 module qualification program for EMI/EMC, environmental, and seismic testing. A separate WBT-specific qualification summary report will be issued documenting qualification of the WBT PAMS cabinet.

(Last Page of Section 1)

SECTION 2
EQUIPMENT IDENTIFICATION

The Equipment Under Test (EUT) for the environmental and seismic test sequences of the test program are identified in Table 2.1-1.

Table 2.1-1. EUT Identification

	Description
	AI687 Module
	AI688 Module

(Last Page of Section 2)

SECTION 3
WATTS BAR UNIT 2 QUALIFICATION REQUIREMENTS

3.1 SEISMIC

[]^{a,c} identifies that the PAMS []^{a,c} will be located []^{a,c} at Watts Bar Unit 2. The applicable floor response spectra (FRS) are those for the []^{a,c} which were provided by []^{a,c}. Figures 3.1-1 through 3.1-6 show the operating basis earthquake (OBE) and safe shutdown earthquake (SSE) FRS as provided in Reference 4. (The markings on these figures were on the original Reference 4 transmittal.)

[

] ^{a,b,c}



Figure 3.1-1. [

]a,c



Figure 3.1-2. [

I^{a,c}



Figure 3.1-3. [

] ^{a,c}



Figure 3.1-4. [

] a.c



Figure 3.1-5. [

] ^{a,c}



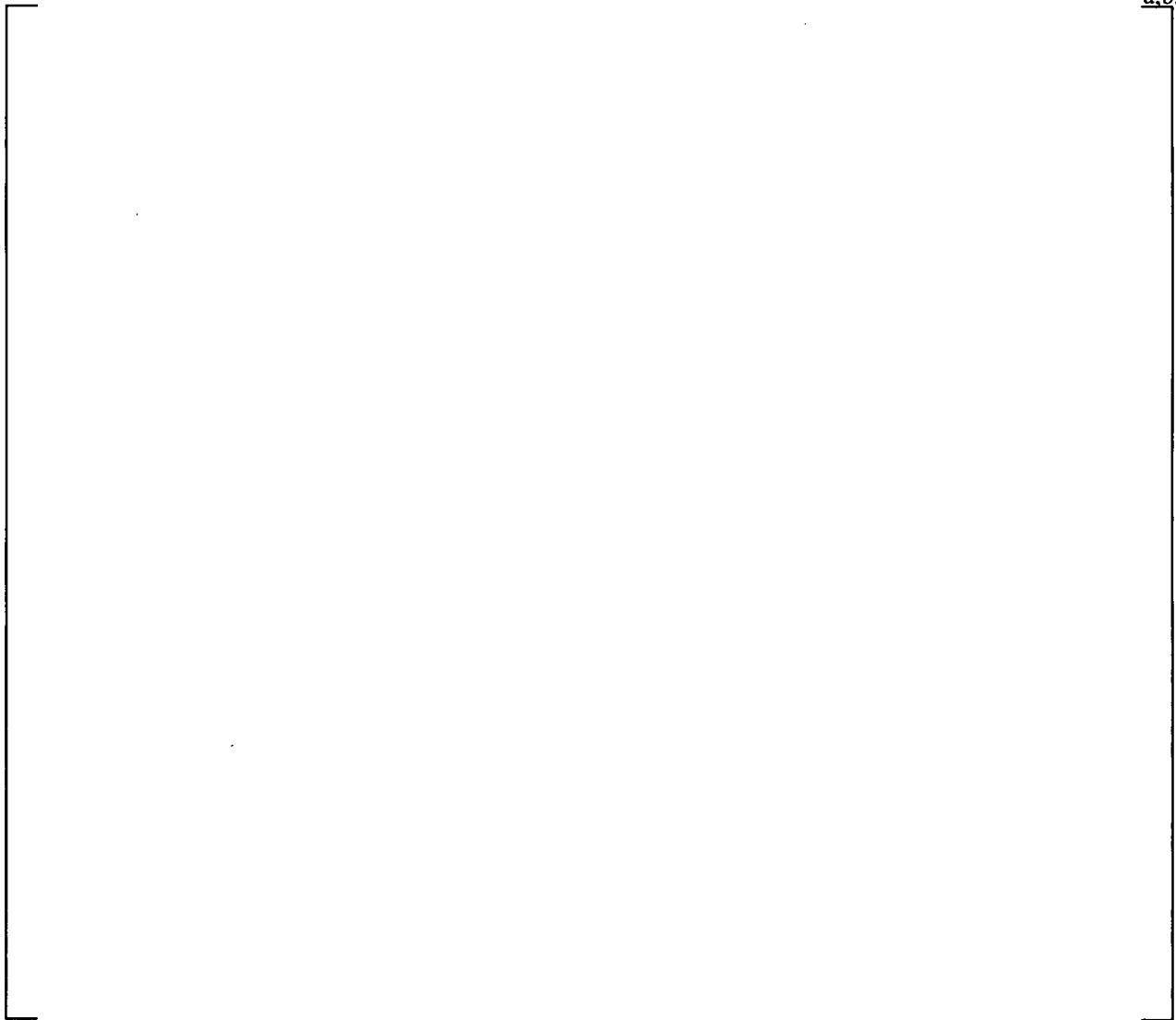
Figure 3.1-6. [

]a.c



Figure 3.1-7. [

] a,c



a,b,c

Figure 3.1-8. [

]a,b,c

a,b,c



Figure 3.1-9. [

] a,b,c

a,b,c



Figure 3.1-10. [

] a,b,c

a,b,c



Figure 3.1-11. [

] a,b,c

3.2 ENVIRONMENTAL

The environmental conditions that the WBT PAMS []^{a,c} is expected to experience are identified in []^{a,c} and clarified []^{a,c} and summarized below in Table 3.2-1. []^{a,c}

Table 3.2-1. []^{a,c} Environmental Conditions

SECTION 4 QUALIFICATION TEST CONDITIONS

4.1 SEISMIC TEST

Seismic qualification testing was performed []^{a,c} during July and August 2010, following completion of the environmental testing sequence. The seismic testing was performed in accordance with the requirements of IEEE Std 344-1987 (Reference 10). Documentation of the completed test program is included in []^{a,c}.

4.1.1 Equipment Under Test

[]

] ^{a,c}

4.1.2 Seismic Test Levels

The EUT were subjected to []^{a,c} OBE seismic test runs. Figures 4.1-1 through 4.1-3 show the OBE Test Response Spectra (TRS) versus the Required Response Spectra (RRS) []^{a,c} in the front-to-back, side-to-side, and vertical directions, respectively, from the seismic testing. The TRS for the OBE test runs shows that the TRS envelop the RRS []^{a,c}.

Figures 4.1-4 through 4.1-6 show the SSE TRS versus the RRS []^{a,c} in the front-to-back, side-to-side, and vertical directions, respectively, during the acceptable SSE test run for the AI688. []

[]^{a,c} Figures 4.1-7 through 4.1-9 show the SSE TRS versus the RRS []^{a,c} in the front-to-back, side-to-side, and vertical directions, respectively, during the acceptable SSE test run for the AI687 module. The TRS for the SSE test runs show that the TRS envelop the RRS []^{a,c}.

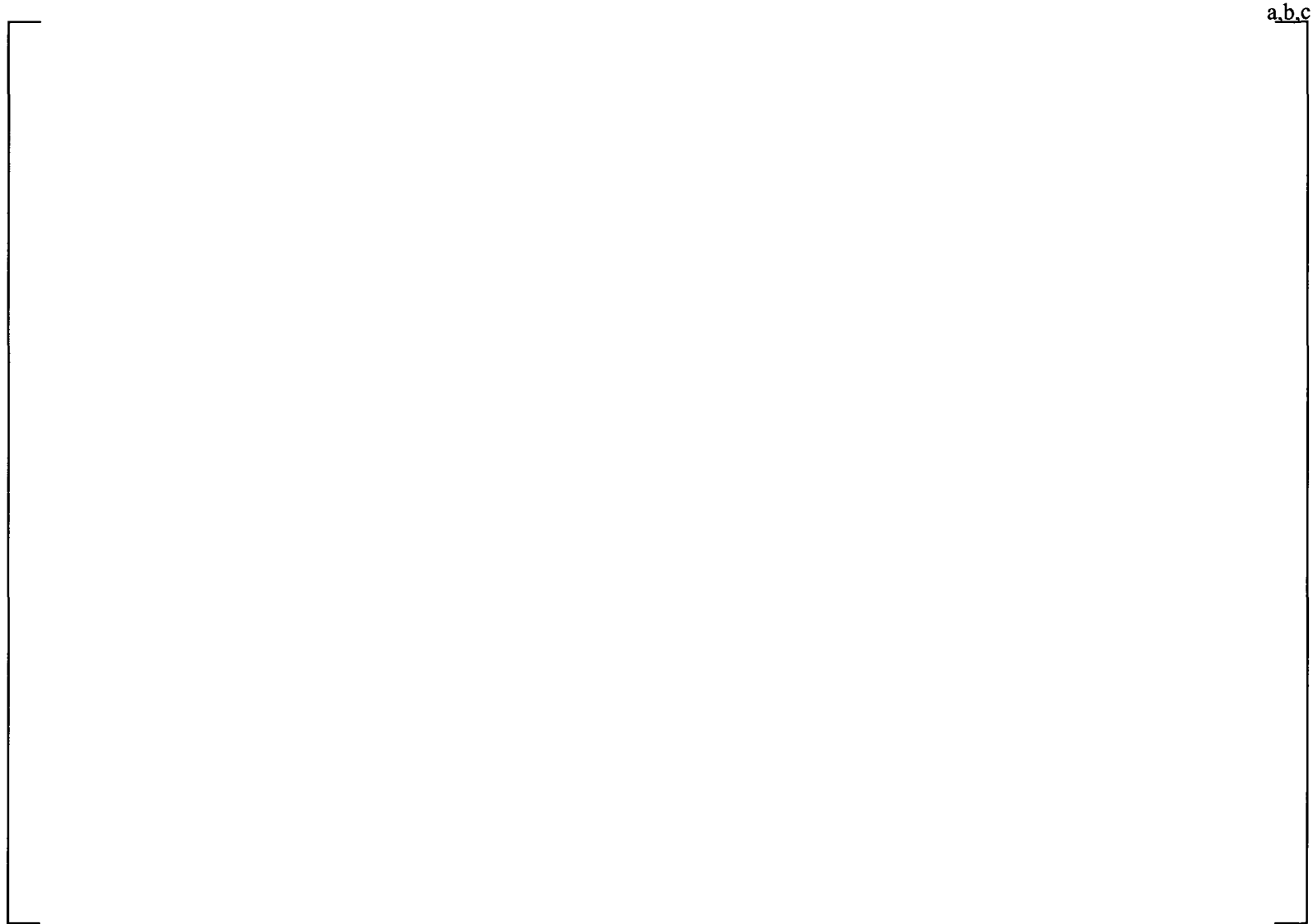


Figure 4.1-1. [

] ^{a,b,c}



Figure 4.1-2. [

]a,b,c

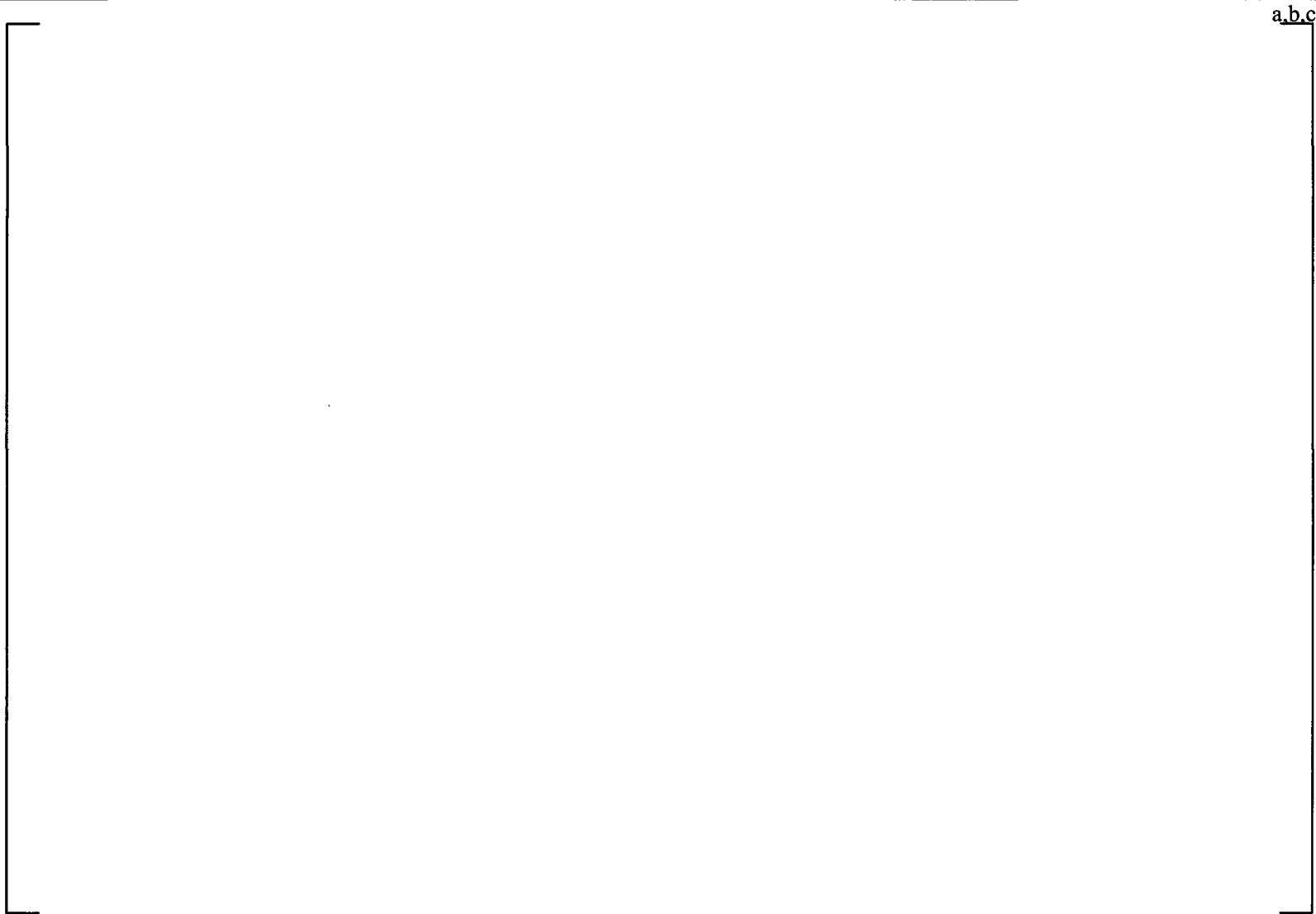


Figure 4.1-3. [

] a,b,c



Figure 4.1-4. [

]a,b,c

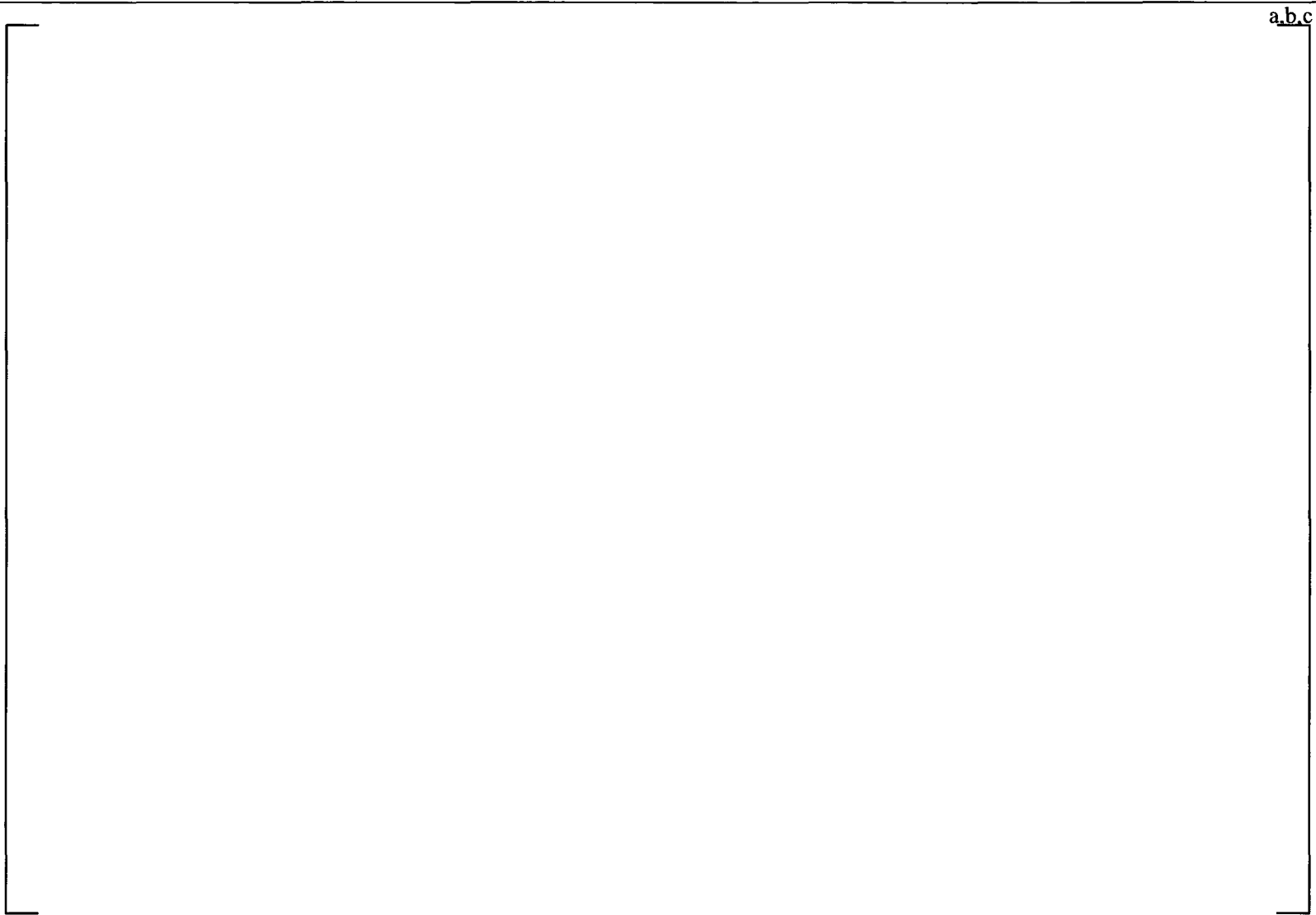


Figure 4.1-5. [

] a,b,c



Figure 4.1-6. [

] a,b,c



Figure 4.1-7. [

] a,b,c



Figure 4.1-8. [

]a,b,c

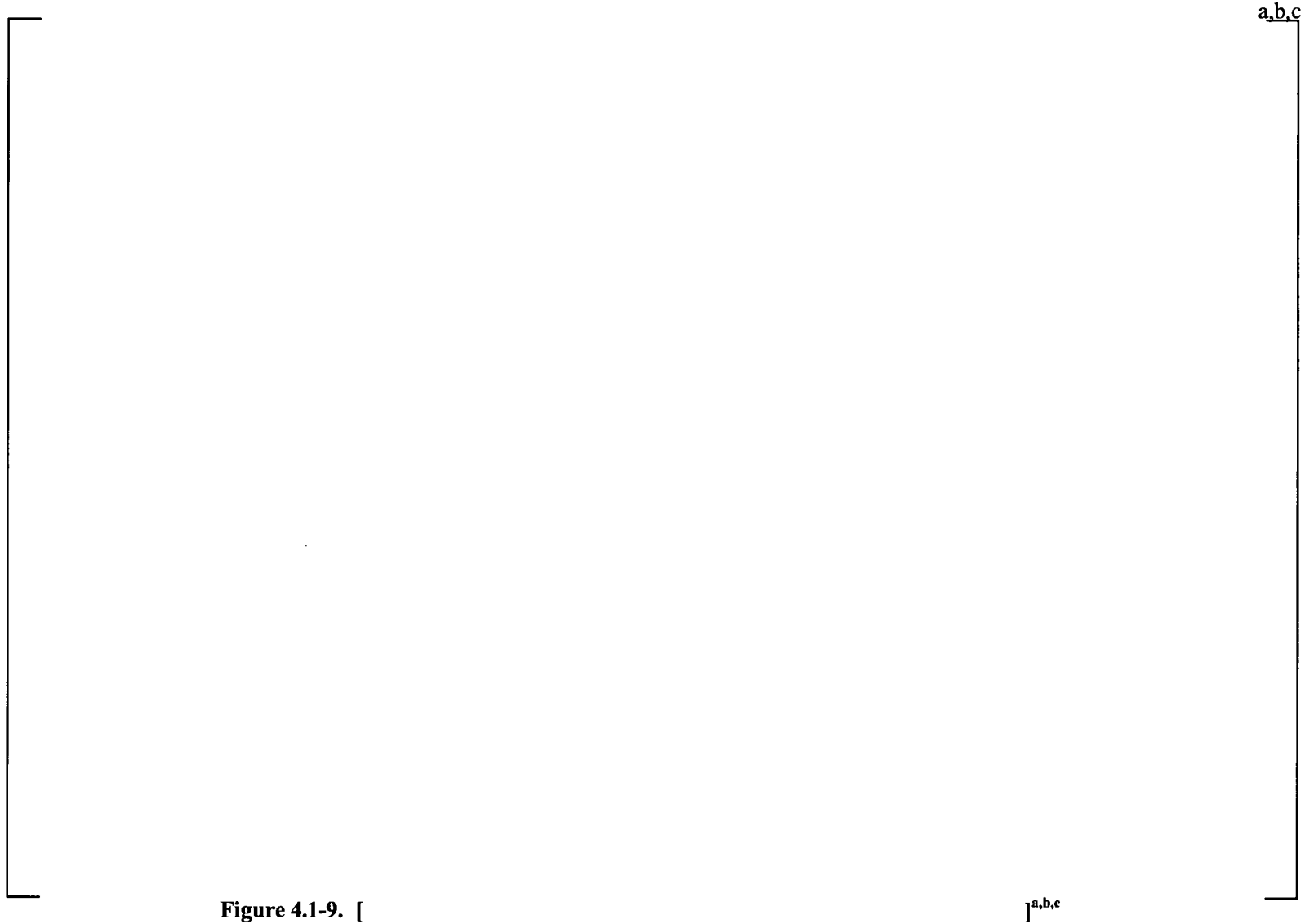


Figure 4.1-9. [

] a,b,c

4.2 ENVIRONMENTAL TEST

Environmental testing was performed []^{a,c} during July 2010. The environmental testing was performed in accordance with the requirements of IEEE Std 323-1983 (Reference 11). Documentation of the completed test program is included in []^{a,c}.

4.2.1 Equipment Under Test

The components identified in Table 2.1-1 were []^{a,c} placed in the center of the []^{a,c} environmental chamber during the environmental test sequence.

4.2.2 Environmental Conditions

The EUT were subjected to an environmental profile that enveloped the requirements identified in the []^{a,c}. The environmental profile that was tested to is contained in Figure 4.2-1. A []^{a,c} chart from the environmental chamber chart recorder []^{a,c} is included in Figure 4.2-2.

a.c



Figure 4.2-1. []^{a,c}



a,b,c

Figure 4.2-2. [

]a,b,c

(Last Page of Section 4)

SECTION 5
COMPARISON OF WBT REQUIREMENTS AND TEST CONDITIONS

5.1 SEISMIC COMPARISON

Figures 5.1-1 through 5.1-3 compare the TRS from the SSE test runs []^{a,c} while Figures 5.1-4 through 5.1-6 compare the TRS from the OBE test runs []^{a,c}.

[]^{a,c}
Figures 5.1-1 through 5.1-3 show that both the qualified level for the AI688 module []^{a,c} and the qualified level for the AI687 module []^{a,c} envelop the WBT SSE []^{a,c}.

The OBE comparisons shown in Figures 5.1-4 through 5.1-6 demonstrate that the OBE test level significantly exceeded the WBT OBE []^{a,c}.

a,b,c



Figure 5.1-1. [

]a,b,c



Figure 5.1-2. [

]a,b,c



Figure 5.1-3. [

] a,b,c



a,b,c

Figure 5.1-4. [

] a,b,c



Figure 5.1-5. [

] a,b,c

a,b,c



Figure 5.1-6. [

]a,b,c

5.2 ENVIRONMENTAL COMPARISON

The AI687 and AI688 modules were subjected to []
in Section 4.2. []
the []
environmental conditions []

] ^{a,c} testing as described
] ^{a,c}. Table 5.2-1 shows the comparison of
] ^{a,c} test levels to the WBT-specific abnormal

] ^{a,c}

Table 5.2-1. []

] ^{a,b,c}

] ^{a,b,c}

[]

] ^{a,c}

(Last Page of Section 5)

**SECTION 6
SUMMARY AND CONCLUSIONS**

The comparisons provided in this document demonstrate that the qualification of the Common Q AI687 and AI688 modules documented in []^{a,c} envelops the Watts Bar Unit 2 specific seismic and environmental requirements for the PAMS []^{a,c}.

(Last Page of Section 6)

Attachment 15

Westinghouse Electric Company document CAW-11-3297, Application For Withholding Proprietary Information From Public Disclosure EQ-EV-62-WBT-P, "Comparison of Tested Conditions for the AI687 and AI688 Common Q Modules to the Watts Bar Unit 2 (WBT) Requirements," Rev. 1 (proprietary)," dated November 3, 2011 (Letter Item 5)



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Proj letter: WBT-D-3595

CAW-11-3297

November 3, 2011

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject: EQ-EV-62-WBT-P, Rev. 1, "Comparison of Tested Conditions for the AI687 and AI688 Common Q Modules to the Watts Bar Unit 2 (WBT) Requirements" (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-11-3297 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 Tennessee Valley Authority.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-11-3297, and should be addressed to J. A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company LLC, Suite 428, 1000 Westinghouse Drive, Cranberry Township, Pennsylvania 16066.

Very truly yours,

A handwritten signature in black ink, appearing to read "J. A. Gresham".

J. A. Gresham, Manager
Regulatory Compliance

Enclosures

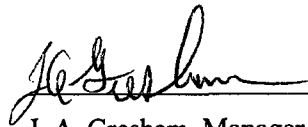
AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

SS

COUNTY OF BUTLER:

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:

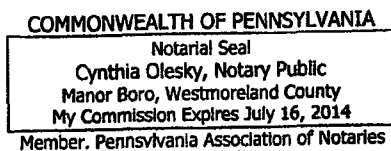


J. A. Gresham, Manager
Regulatory Compliance

Sworn to and subscribed before me
this 3rd day of November 2011



Notary Public



- (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 EQ-EV-62-WBT-P, Rev. 1, "Comparison of Tested Conditions for the AI687 and AI688 Common Q Modules to the Watts Bar Unit 2 (WBT) Requirements" (Proprietary) for submittal to the Commission, being transmitted by Tennessee Valley Authority 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 Post-Accident Monitoring System (PAMS) and may be used only for that purpose.

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

- (a) Assist the customer in providing technical licensing information to the NRC that is required for approval of the Watts Bar Nuclear Unit 2 PAMS System.

Further this information has substantial commercial value as follows:

- (a) Westinghouse plans to sell the use of similar information to its customers for the purpose of licensing in-core instrumentation systems.
- (b) Its use by a competitor would improve his competitive position in the development and licensing of a similar product.
- (c) The information requested to be withheld reveals the distinguishing aspects of a design 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, analysis 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.

Tennessee Valley Authority
Letter for Transmittal to the NRC

The following paragraphs should be included in your letter to the NRC:

Enclosed are:

1. ___ copies of EQ-EV-62-WBT-P, Rev. 1, "Comparison of Tested Conditions for the AI687 and AI688 Common Q Modules to the Watts Bar Unit 2 (WBT) Requirements" (Proprietary)
2. ___ copies of EQ-EV-62-WBT-NP, Rev. 1, "Comparison of Tested Conditions for the AI687 and AI688 Common Q Modules to the Watts Bar Unit 2 (WBT) Requirements" (Non-Proprietary)

Also enclosed is the Westinghouse Application for Withholding Proprietary Information from Public Disclosure CAW-11-3297, accompanying Affidavit, Proprietary Information Notice, and Copyright Notice.

As Item 1 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.

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.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse affidavit should reference CAW-11-3297 and should be addressed to J. A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company LLC, Suite 428, 1000 Westinghouse Drive, Cranberry Township, Pennsylvania 16066.