



Westinghouse Electric Company  
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USA

U.S. Nuclear Regulatory Commission  
ATTENTION: Document Control Desk  
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e-mail: [sterdia@westinghouse.com](mailto:sterdia@westinghouse.com)

Your ref: Project Number 740  
Our ref: DCP/NRC1744

May 31, 2006

Subject: AP1000 COL Technical Report Submittal

In support of Combined License application pre-application activities, Westinghouse is submitting an AP1000 Standard Combined License Technical report. These reports complete and document, on a generic basis, activities required for COL information items in the AP1000 Design Control Document. This report is submitted as part of the NuStart Bellefonte COL Project (NRC Project Number 740). The information included in this report is generic and is expected to apply to all projects referencing the AP1000 Design Certification.

The purpose for the submittal of this report and the expected pre-application review was explained in a March 8, 2006 letter from NuStart to the NRC.

Pursuant to 10 CFR 50.30(b), APP-GW-GLR-024, Rev. 0, "Setpoint Calculations for Protective Functions," Technical Report Number 28, is submitted as Enclosure 1 under the attached Oath of Affirmation.

It is expected that when the NRC review of these reports is complete, the subject COL Information Items will be considered complete for COL applicants referencing the AP1000 Design Certification.

Questions or requests for additional information related to the content and preparation of these reports should be directed to Westinghouse. Please send copies of such questions or requests to the prospective applicants for combined licenses referencing the AP1000 Design Certification. A representative for each applicant is included on the cc: list of this letter.

Very truly yours,

A handwritten signature in black ink, appearing to read 'D. F. Hukhug for'.

A. Sterdis, Manager  
Licensing and Customer Interface  
Regulatory Affairs and Standardization

/Attachment

1. "Oath of Affirmation," dated May 31, 2006

/Enclosure

1. APP-GW-GLR-024, Rev. 0, "Setpoint Calculations for Protective Functions," Technical Report Number 28.

cc:	S. Bloom	- U.S. NRC	1A	1E
	G. Curtis	- TVA	1A	1E
	L. Dudes	- U.S. NRC	1A	1E
	P. Grendys	- Westinghouse	1A	1E
	P. Hastings	- Duke Power	1A	1E
	C. Ionescu	- Progress Energy	1A	1E
	D. Lindgren	- Westinghouse	1A	1E
	A. Monroe	- SCANA	1A	1E
	C. Pierce	- Southern Company	1A	1E
	E. Schmiech	- Westinghouse	1A	1E
	G. Zinke	- NuStart/Entergy	1A	1E

DCP/NRC1744  
May 31, 2006

## **ATTACHMENT 1**

### **Oath of Affirmation**

NUCLEAR REGULATORY COMMISSION

**NRC Project Number 740**

**FOR COL APPLICATION PRE-APPLICATION REVIEW**

Aris S. Candris, being duly sworn, states that he is Senior Vice President, Nuclear Services, for Westinghouse Electric Company; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission this document; that all statements made and matters set forth therein are true and correct to the best of his knowledge, information and belief.

**Aris S. Candris**  
Senior Vice President  
Nuclear Services

Subscribed and sworn to  
before me this 3/1st day  
of May 2006.

**2009**  
**COMMONWEALTH OF PENNSYLVANIA**  
**Notarial Seal**  
**Debra McCarthy, Notary Public**  
**Monroeville Boro, Allegheny County**  
**My Commission Expires Aug. 31, 2009**  
**Member, Pennsylvania Association of Notaries**

**Notary Public**

**ENCLOSURE 1**

**APP-GW-GLR-024, Rev. 0**

**“Setpoint Calculations for Protective Functions”**

**Technical Report Number 28**

# AP1000 DOCUMENT COVER SHEET

TDC: \_\_\_\_\_ Permanent File: \_\_\_\_\_ APY: \_\_\_\_\_  
RFS#: \_\_\_\_\_ RFS ITEM #: \_\_\_\_\_

AP1000 DOCUMENT NO. APP-GW-GLR-024	REVISION NO. 0	Page 1 of 4	ASSIGNED TO W-Winters
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ALTERNATE DOCUMENT NUMBER:

WORK BREAKDOWN #:

ORIGINATING ORGANIZATION: Westinghouse Electric Company

TITLE: AP1000 Setpoint Calculations for Protective Functions

ATTACHMENTS:

DCP #/REV. INCORPORATED IN THIS DOCUMENT REVISION:

CALCULATION/ANALYSIS REFERENCE:

ELECTRONIC FILENAME APP-GW-GLR-024	ELECTRONIC FILE FORMAT Microsoft Word	ELECTRONIC FILE DESCRIPTION
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Class 3 Documents being transmitted to the NRC require the following two review signatures in lieu of a Form 36.

LEGAL REVIEW T.J. WHITE	SIGNATURE/DATE <i>T.J. White</i> 5-31-06
PATENT REVIEW F.L. CARPENTINO	SIGNATURE/DATE SIGNATURE ON FILE 5/31/2006

☐ WESTINGHOUSE PROPRIETARY CLASS 2

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*Reviewed  
W. J. Hummer*

ORIGINATOR T. Hayes	SIGNATURE/DATE <i>T. Hayes</i> 5/31/06
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REVIEWERS	SIGNATURE/DATE
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VERIFIER D.A. LINDGREN	SIGNATURE/DATE <i>D.A. Lindgren</i> 5/31/06	VERIFICATION METHOD PAGE BY PAGE REVIEW
AP1000 RESPONSIBLE MANAGER J. Winters	SIGNATURE <i>J. Winters</i>	APPROVAL DATE 5/31/06

\* Approval of the responsible manager signifies that document is complete, all required reviews are complete, electronic file is attached and document is released for use.

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**APP-GW-GLR-024**  
**Revision 0**

**May 2006**

# **AP1000 Standard Combined License Technical Report**

## **AP1000 Setpoint Calculations for Protective Functions**

**Revision 0**

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**Westinghouse Electric Company LLC**  
Nuclear Power Plants  
Post Office Box 355  
Pittsburgh, PA 15230-0355

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**INTRODUCTION:**

This technical report addresses AP1000 Combined License Information Item 7.1-1 of the AP1000 DCD (Reference 1) (FSER Action Item 7.1.7-1 from Reference 2) on Setpoint Calculations for Protective Functions. The information item is as follows:

Combined License applicants referencing the AP1000 certified design will provide a calculation of setpoints for protective functions consistent with the methodology presented in Reference 5. Reference 5 is an AP600 document that describes a methodology that is applicable to AP1000. AP1000 has some slight differences in instrument spans.

WCAP-16361-P (Reference 3) provides information to close this Combined License Information Item. Based on this report, including WCAP-16361-P, the NRC should consider the COL information item closure to be acceptable and generically applicable to COL applications referencing the AP1000 design certification.

**TECHNICAL BACKGROUND:**

The setpoint study was performed using the approach previously accepted by the NRC for AP600, referenced in the AP1000 DCD (Reference 1) Section 7.1.6, and documented in WCAP-14605 (Reference 4).

WCAP-16361-P (Reference 3) provides the results of a setpoint study for the AP1000 protective functions. This report was prepared to document the preliminary instrument uncertainty calculations for the Reactor Trip System (RTS) and the Engineered Safeguards Features Actuation System (ESFAS) functions for the AP1000. Reconciliation of the final setpoint study for each plant can not be performed until the design for that plant is finalized. This report is provided for submission with Combined Operating License (COL) applications, and reflects the AP1000 instrumentation and control (I&C) design to the extent that is required to support a COL application. Prior to initial fuel load, a reconciliation of this setpoint study against the final design for each plant will be performed as required by the AP1000 Inspection, Test, and Analysis Acceptance Criteria (ITAAC) (AP1000 DCD Tier 1 Table 2.5.2-8, item 10).

**REGULATORY IMPACT:**

The AP1000 FSER (Reference 3) in Subsection 7.2.7 discusses the requirements for a setpoint study. This setpoint study forms that basis for the allowable values and trip setpoints specified in brackets in the AP1000 RPS and ESFAS Technical Specifications. These proposed changes to the technical specifications will be included in a future submittal which includes these and other proposed Technical Specification changes. Using WCAP-16361-P for generic closure of Combined License Information Item 7.1-1 does not alter the conclusions in FSER Subsection 7.2.7.

This report does not include any change to:

- a System, Structure, or Component (SSC)
- a procedure
- a DCD-described evaluation methodology
- a test or experiment not described in the DCD where an SSC is utilized or controlled in a manner that is outside the reference bounds of the design for that SSC or is inconsistent with analyses or descriptions in the DCD

As a result, the changes to the DCD presented in this report do not represent an adverse change to the design function or to how design functions are performed or controlled. The changes to the DCD do not involve revising or replacing a DCD-described evaluation methodology nor involve a test or experiment



not described in the DCD. The DCD change does not require a license amendment per the criteria of VIII. B. 5.b. of Appendix D to 10 CFR Part 52.

In addition, the DCD change does not affect resolution of a severe accident issue and does not require a license amendment based on the criteria of VIII. B. 5.c of Appendix D to 10 CFR Part 52.

The subject changes will not alter barriers or alarms that control access to protected areas of the plant. The subject changes will not alter requirements for security personnel. Therefore, the proposed change does not have an adverse impact on the security assessment of the AP1000.

## REFERENCES

1. APP-GW-GL-700, AP1000 Design Control Document, Revision 15
2. NUREG-1793, Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design, September 2004.
3. WCAP-16361-P, "Westinghouse Setpoint Methodology for Protection Systems – AP1000," Revision 0, May 2006.
4. WCAP-14605, "Westinghouse Setpoint Methodology for Protection Systems, AP600," April 1996.

## DCD Mark-Up

The following DCD markups identify how COL application FSARs should be prepared to incorporate the subject change.

Revise the first paragraph of Subsection 7.1.6 as follows:

### 7.1.6 Combined License Information

**Complete.** ~~Combined License applicants referencing the AP1000 certified design will provide a~~ A calculation of setpoints for protective functions is provided in Reference 17. Reference 17 is consistent with the methodology presented in Reference 5. Reference 5 is an AP600 document that describes a methodology that is applicable to AP1000. ~~AP1000 has some slight differences in instrument spans.~~

Add Item 17 in Subsection 7.1.7 as follows:

### 7.1.7 References

17. WCAP-16361-P (Proprietary) and WCAP-16361-NP (Non-Proprietary), "Westinghouse Setpoint Methodology for Protection Systems, - AP1000," May, 2006

# AP1000 DOCUMENT COVER SHEET

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TITLE: AP1000 Setpoint Calculations for Protective Functions

ATTACHMENTS:	DCP #/REV. INCORPORATED IN THIS DOCUMENT REVISION:
CALCULATION/ANALYSIS REFERENCE:	

ELECTRONIC FILENAME APP-GW-GLR-024	ELECTRONIC FILE FORMAT Microsoft Word	ELECTRONIC FILE DESCRIPTION
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LEGAL REVIEW T.J. WHITE	SIGNATURE/DATE <i>T.J. White</i> 5-31-06
PATENT REVIEW F.L. CARPENTINO	SIGNATURE/DATE SIGNATURE ON FILE 5/31/2006

### ☐ WESTINGHOUSE PROPRIETARY CLASS 2

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*Approved  
W. Blum*

ORIGINATOR T. Hayes	SIGNATURE/DATE T. Hayes 5/31/06	
REVIEWERS	SIGNATURE/DATE	
VERIFIER D. A. LINDGREN	SIGNATURE/DATE D. A. Lindgren 5/31/06	VERIFICATION METHOD PAGE BY PAGE REVIEW
AP1000 RESPONSIBLE MANAGER J. Winters	SIGNATURE J. Winters	APPROVAL DATE 5/31/06

\* Approval of the responsible manager signifies that document is complete, all required reviews are complete, electronic file is attached and document is released for use.

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**APP-GW-GLR-024**  
**Revision 0**

**May 2006**

# **AP1000 Standard Combined License Technical Report**

## **AP1000 Setpoint Calculations for Protective Functions**

**Revision 0**

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**REGULATORY IMPACT:**

The AP1000 FSER (Reference 3) in Subsection 7.2.7 discusses the requirements for a setpoint study. This setpoint study forms that basis for the allowable values and trip setpoints specified in brackets in the AP1000 RPS and ESFAS Technical Specifications. These proposed changes to the technical specifications will be included in a future submittal which includes these and other proposed Technical Specification changes. Using WCAP-16361-P for generic closure of Combined License Information Item 7.1-1 does not alter the conclusions in FSER Subsection 7.2.7.

This report does not include any change to:

- a System, Structure, or Component (SSC)
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As a result, the changes to the DCD presented in this report do not represent an adverse change to the design function or to how design functions are performed or controlled. The changes to the DCD do not involve revising or replacing a DCD-described evaluation methodology nor involve a test or experiment

not described in the DCD. The DCD change does not require a license amendment per the criteria of VIII. B. 5.b. of Appendix D to 10 CFR Part 52.

In addition, the DCD change does not affect resolution of a severe accident issue and does not require a license amendment based on the criteria of VIII. B. 5.c of Appendix D to 10 CFR Part 52.

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## REFERENCES

1. APP-GW-GL-700, AP1000 Design Control Document, Revision 15
2. NUREG-1793, Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design, September 2004.
3. WCAP-16361-P, "Westinghouse Setpoint Methodology for Protection Systems – AP1000," Revision 0, May 2006.
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## DCD Mark-Up

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Revise the first paragraph of Subsection 7.1.6 as follows:

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**Complete.** ~~Combined License applicants referencing the AP1000 certified design will provide a~~ calculation of setpoints for protective functions is provided in Reference 17. Reference 17 is consistent with the methodology presented in Reference 5. Reference 5 is an AP600 document that describes a methodology that is applicable to AP1000. ~~AP1000 has some slight differences in instrument spans.~~

Add Item 17 in Subsection 7.1.7 as follows:

### 7.1.7 References

17. WCAP-16361-P (Proprietary) and WCAP-16361-NP (Non-Proprietary), "Westinghouse Setpoint Methodology for Protection Systems, - AP1000," May, 2006



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Our ref: DCP/NRC1745

May 31, 2006

TRANSMITTAL OF PROPRIETARY INFORMATION

Enclosed please find Westinghouse document titled, "Westinghouse Setpoint Methodology for Protection Systems – AP1000," WCAP-16361-P (Proprietary), dated May 2006. WCAP-16361-NP (Non-Proprietary) will follow under separate cover.

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 the affidavit or Application for Withholding should reference AW-06-2155 and should be addressed to B. F. Maurer, Acting 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 cursive script, reading "D. F. Hukling for".

Andrea Sterdis, Manager  
Licensing and Customer Interface  
Regulatory Affairs and Standardization

/Enclosures

1. Westinghouse Electric Company Copyright Notice, Proprietary Information Notice, Application for Withholding AW-06-2155 (Non-proprietary)
2. One (1) copy of Affidavit (Non-proprietary)
3. WCAP-16361-P, "Westinghouse Setpoint Methodology for Protection Systems-AP1000," (Proprietary)

cc: B. Benney	- U. S. Nuclear Regulatory Commission, Rockville, MD		
D. Lindgren	- Westinghouse, Pittsburgh, PA		
E. Schmiech	- Westinghouse, Pittsburgh, PA		
J. McInerney	- Westinghouse, Pittsburgh, PA		
S. Bloom	- U. S. Nuclear Regulatory Commission, Rockville, MD	1A	1E



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Direct fax: 412-374-5456  
e-mail: winterj@westinghouse.com

Our ref: AW-06-2155

May 31, 2006

**APPLICATION FOR WITHHOLDING PROPRIETARY  
INFORMATION FROM PUBLIC DISCLOSURE**

**Subject: WCAP-16361-P, "Westinghouse Setpoint Methodology for Protection Systems – AP1000"  
(Proprietary)**

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-06-2155 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-06-2155 and should be addressed to B. F. Maurer, Acting 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 "John J. McInerney".

John J. McInerney, Director  
Director, Safety & Monitoring Systems

cc: B. Benney - U. S. Nuclear Regulatory Commission



AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

SS

COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared John J. McNerney, 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:

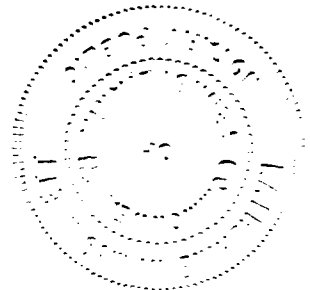
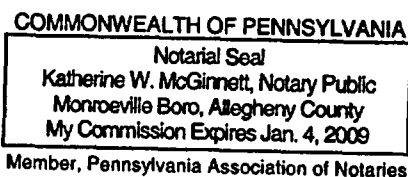


John J. McNerney, Director  
Safety & Monitoring Systems

Sworn to and subscribed  
before me this 31 day  
of MAY, 2006



Notary Public



- (1) I am Director, Director, Safety & Monitoring Systems, in Repair Replacement and Automation 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 WCAP-16361-P, "Westinghouse Setpoint Methodology for Protection Systems – AP1000" (Proprietary), dated May 2006 being transmitted by Westinghouse letter (DCP/NRC1745) and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse for the AP1000 plant program is expected to be applicable in other licensee submittals in response to certain NRC requirements for justification of preliminary instrument uncertainty calculations for the Reactor Trip System (RTS) and Engineered Safeguards Features Actuation System (ESFAS) functions.

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

- (a) Provide documentation supporting determination of WCAP-16361-P analysis on a plant specific basis
- (b) Support Combined Operating License (COL) applications.

Further this information has substantial commercial value as follows:

- (a) Westinghouse plans to sell the use of similar information to its customers for purposes of meeting NRC requirements for Licensing Documentation.
- (b) Westinghouse can sell support and defense of AP1000 Design Certification.
- (c) 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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