



Westinghouse Electric  
Company, LLC

Nuclear Systems & Projects

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DCP/NRC1477  
Project 711

May 4, 2001

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

ATTENTION: Mr. Alan Rae, NRC, MS 12E15

SUBJECT: Transmittal of Westinghouse Proprietary Class 2 Document WCAP-15644,  
"AP1000 Code Applicability Report," dated April 27, 2001

#### REFERENCES

1. WCAP-15612, "AP1000 Plant Description and Analysis Report," dated December 2000
2. WCAP-15613, "AP1000 PIRT and Scaling Assessment Report," dated February 2001
3. NRC letter S. J. Collins to W. E. Cummins, dated December 5, 2000

#### ATTACHMENTS

1. WCAP-15644, "AP1000 Code Applicability Report"
2. Application for Withholding Proprietary Information from Public Disclosure

Dear Mr. Rae:

The purpose of this letter is fourfold: to transmit WCAP-15644; to summarize Westinghouse's expectations from the pre-application review of the proposed analysis codes to be used to perform safety analysis in support of an application for Design Certification of the AP1000; to respond to your request in Reference 3 for Westinghouse to supply the documentation, source code, and executable files for the safety analysis codes that are being assessed by the NRC for their applicability to the AP1000; and to propose an alternative approach that accomplishes the review in an efficient manner.

#### AP1000 Code Applicability Report

Attached please find WCAP-15644, "AP1000 Code Applicability Report." This report provides our conclusions and rationale regarding the applicability of the AP600 safety analysis codes that were developed, validated, and approved during the AP600 Design Certification to the AP1000. The report is enclosed as Attachment 1 and is considered proprietary to Westinghouse. On the basis of the evaluation documented in WCAP15644, Westinghouse has concluded that the AP600 analysis codes LOFTRAN, WGOthic, WCOBRA-TRAC and NOTRUMP are applicable for the safety analyses for AP1000. However, Westinghouse has also determined that it will perform a supplementary analysis of the limiting portion of the small break loss of coolant accident spectrum using WCOBRA-TRAC. This supplemental analysis will be submitted to the NRC for approval as part of the Design Certification application.

*Rob*  
11/03

### Westinghouse Expectations from NRC Review of Code Applicability

Our submittals during this pre-application review are focused on providing a justification for the continued use of the AP600 approved safety analysis codes for AP1000. Therefore, we believe that the review of our analysis codes should address only the applicability of the codes to the AP1000. As outlined in detail in our submittals, the AP1000 represents an incremental change to a well-understood designed and certified plant design. The analysis codes proposed represent approved safety analysis codes. The AP600 and AP1000 plant designs provide large safety margins for postulated design basis accidents. The margins to the regulatory limits of the most limiting accidents are significantly larger than those of currently operating plants. Therefore, Westinghouse requests that the NRC review our submittals to determine the applicability to AP1000 of the safety analysis codes that were approved for AP600. Based on this review, the NRC can make determinations of the applicability of the codes to the AP1000 and identify issues that require additional Westinghouse response. Westinghouse requests that the licensing basis and precedents set from the approval of these codes for AP600 be used as a basis for their applicability to AP1000.

As a result of the review of Attachment 1, and in conjunction with the descriptions and evaluations provided in References 1 and 2, Westinghouse is seeking a pre-application review finding that concludes that the AP600 analysis codes, if supplemented by the review and approval of a WCOBRA-TRAC analysis of the IRWST injection phase of the SBLOCA, are adequate for analysis of the AP1000 design and extensive re-review of the previously approved analysis codes is not required for AP1000 Design Certification.

### Response to Reference 3

In Reference 3, the NRC states that their procedure for reviewing computer codes is to require a submittal of documentation that is understandable to the knowledgeable reviewer, free of errors, and complete in its description and support of the computer code. In addition, the staff is requesting that Westinghouse provide both the source code and an executable file for each of the analysis codes under review so that the staff can exercise the codes. The staff has indicated that it is their intent to attempt to install the codes on several different operating systems, to test the codes for stability and proper operation.

For the AP1000 safety analyses, Westinghouse plans to use analysis codes that have been previously approved by the NRC; approvals that, in some instances, took many years to achieve. Subjecting the codes to a new review does not appear to be justified or consistent with Westinghouse's objective to avoid re-review for AP1000 if applicable work was completed in the AP600 review. Westinghouse has previously submitted to the NRC the code documentation associated with the versions of LOFTRAN, WGOthic, WCOBRA-TRAC (large break and long-term cooling models), and NOTRUMP that were developed for the AP600. The NRC performed a complete review of the analysis codes using basic principles and procedures similar to those recently documented in the Draft Regulatory Guide 1096. The NRC review and approval of the AP600 codes and validation process is documented in NUREG-1512, "Final Safety Evaluation Report Related to Certification of the AP600 Standard Design" dated September 1998. The issue to be assessed in this pre-application review is to determine whether there are any applicability issues related to the approved codes as a result of changing from AP600 to AP1000. WCAP-15644 provides our assessment of the code applicability of the AP600 codes to the AP1000. If necessary, Westinghouse can furnish additional copies of the code documentation that was reviewed during the AP600 Design Certification review, or prior generic code reviews if applicable. However, because these codes have already been approved and for reasons stated below, Westinghouse does not intend to submit the source code and executable files to the NRC as part of this review.

In WCAP-15644, Westinghouse proposes to develop and use a supplemental WCOBRA-TRAC model for the purposes of supplementing the NOTRUMP small-break (SB) LOCA analysis during the transition to IRWST injection phase. As discussed in the report, this phase of the SBLOCA accident is the most critical, and is the portion of the accident that can be most influenced by phenomena such as momentum flux and entrainment, for which the models in NOTRUMP were found to be less than ideal. This code will be submitted to the NRC staff for review in the AP1000 Design Certification phase. As this code has not yet been previously approved for passive plant safety analysis, Westinghouse will submit the code documentation, including the source code and executable file to the NRC to assist in their review of the code.

As mentioned previously, our major objections to the staff exercising the approved analysis codes as a condition of the pre-certification review is as follows:

- Approval status of the AP600 codes – The analysis codes have already been approved. Current regulations do not require submittal of these codes as a condition of their review. The NRC has already reviewed and approved these codes for AP600, and an extensive re-review is not warranted and is an inefficient use of NRC and Westinghouse resources.
- Efficiency – The staff is not currently experienced with the Westinghouse analysis codes. It is our experience that the training necessary to become proficient with these codes is significant, and will cause an unnecessary regulatory burden on the review of the AP1000. Submittal of the codes to the NRC will require a significant effort for the staff to become proficient with the codes to be able to run them in an efficient manner.

Furthermore, installation of the computer codes on different computer systems, as suggested by the staff accomplishes little in the safety assessment of the plant and does not seem warranted. Westinghouse procedures and Quality Assurance measures ensure that the analysis codes are run on the operating systems for which they have been validated and approved. Testing approved codes on different operating systems to check for code stability does not appear to be consistent with an assessment of the applicability of an approved code to the AP1000.

#### An Alternative Approach

Westinghouse understands that the staff's desire to exercise the analysis codes is based on their need to test the sensitivity to certain assumptions or methods used. This can be addressed in two manners:

The staff can assess the sensitivity of the analysis results using the staff's independent analysis codes. Westinghouse endorses the staff's intention to perform independent analysis of the AP1000 using independent codes that were developed during the AP600 review and Westinghouse has been supplying data to the staff to create the AP1000 models. The overriding interest in any review of the AP1000 is to ensure that the plant safety margins are adequate. Independent analysis of the AP1000 by the NRC using analysis codes that the NRC staff has significant experience in running would provide a high confidence in the large safety margins of the plant. We believe this is the most important and efficient use of the resources available to review the AP1000. These independent analyses can provide information to allow the staff to judge the similarities of the two plants, the range of applicability of the analysis codes used, and the overall safety margins provided by the AP1000.

If further confirmation is considered necessary, the staff and Westinghouse can conduct a series of working sessions at the Westinghouse Energy Center, where NRC staff can oversee Westinghouse safety analysts exercising the codes under the direction of the staff reviewer. We believe that such working sessions will fulfill the staff's desires to test the codes for their applicability to the AP1000 and assess the importance of input assumptions or methods. The advantages to conducting these sessions at Westinghouse are:

- The codes can be run on the operating systems from which they have been approved.
- The Westinghouse analysts that have been trained in these codes can run their sensitivities cases efficiently.
- Westinghouse specialists can be made available to the staff to answer questions that may arise.

Westinghouse believes that such a process will expedite the review and will fulfill the staff's desires to exercise the analysis codes.

May 4, 2001

Proprietary Submittal

The Westinghouse Electric Company proprietary information notice, application for withholding, and affidavit are also attached to the submittal (Attachment 2). Attachment 1 contains Westinghouse proprietary information consisting of trade secrets, commercial information or financial information which we consider privileged or confidential pursuant to 10CFR2.790. Therefore, it is requested that the Westinghouse proprietary information attached hereto be handled on a confidential basis and be withheld from public disclosures

This material is for your internal use only and may be used for the purpose for which it is submitted. It should not be otherwise used, disclosed, duplicated, or disseminated, in whole or in part, to any other person or organization outside the Commission, the Office of Nuclear Reactor Regulation, the Office of Nuclear Regulatory Research and the necessary subcontractors that have signed a proprietary non-disclosure agreement with Westinghouse without the express written approval of Westinghouse.

Correspondence with respect to the application for withholding should reference AW-01-1450, and should be addressed to Hank A. Sepp, Manager of Regulatory and Licensing Engineering, Westinghouse Electric Company, P.O. Box 355, Pittsburgh, Pennsylvania, 15230-0355.

We look forward to discussing the contents of WCAP-15644 and our approach to resolving the applicability of the AP600 analysis codes to the AP1000 at the upcoming meeting on May 10, 2001 in Rockville. Please contact me if you have questions on this issue.

Very truly yours,



M. M. Corletti  
AP600 Engineering  
Passive Plant Projects

/Attachment

cc: H. A. Sepp, Westinghouse (w/o Attachment)

### **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 2.790 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) contained within parentheses 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).



Westinghouse Electric Company, LLC

15230-0355

Box 355  
Pittsburgh Pennsylvania

AW-01-1450

May 4, 2001

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

ATTENTION: Mr. Samuel J. Collins

APPLICATION FOR WITHHOLDING PROPRIETARY  
INFORMATION FROM PUBLIC DISCLOSURE

SUBJECT: Transmittal of Westinghouse Proprietary Class 2 Document WCAP-15644, "AP1000 Code Applicability Report," dated April 27, 2001

Dear Mr. Collins:

The application for withholding is submitted by Westinghouse Electric Company LLC ("Westinghouse") pursuant to the provisions of paragraph (b)(1) of Section 2.790 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 10CFR Section 2.790, Affidavit AW-01-1450 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 10CFR Section 2.790 of the Commission's regulations.

Correspondence with respect to this application for withholding or the accompanying affidavit should reference AW-01-1450 and should be addressed to the undersigned.

Very truly yours,

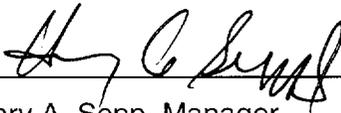
Hank A. Sepp, Manager  
Regulatory and Licensing Engineering

COMMONWEALTH OF PENNSYLVANIA:

SS

COUNTY OF ALLEGHENY:

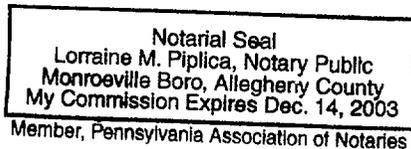
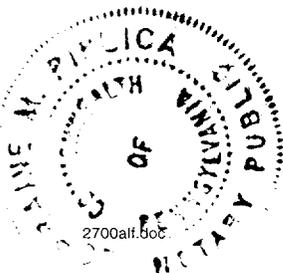
Before me, the undersigned authority, personally appeared Henry A. Sepp, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC ("Westinghouse"), and that the averments of fact set forth in this Affidavit 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 7<sup>th</sup> day  
of May, 2001

Notary Public





- (1) I am Manager, Regulatory and Licensing Engineering, in the Nuclear Services Division, of the 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 rulemaking proceedings, and am authorized to apply for its withholding on behalf of the Westinghouse Electric Company, LLC.
- (2) I am making this Affidavit in conformance with the provisions of 10CFR 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, LLC 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 10CFR 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.

The proprietary information sought to be withheld in this submittal is that which is appropriately marked in the Westinghouse report WCAP-15644, Rev. 0, "AP1000 Code Applicability Report," (Proprietary), for submittal to the Commission. This information is being transmitted by Westinghouse's letter and Application for Withholding Proprietary Information from Public Disclosure, being transmitted by Westinghouse Electric Company (W letter AW-01-1450) and to the Document Control Desk, Attention: P. A. Boenhert, ACRS.

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

- (a) Develop and verify Analytical Models for Small Break LOCA
- (b) Validate computer codes used to analyze postulated accident conditions.

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 AP600 Design Certification.

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 methodologies 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 performing and analyzing tests.

Further the deponent sayeth not.

DCP/NRC1477

Attachment 1

May 4, 2001

WCAP-15644

AP1000 Code Applicability Report