



Westinghouse Electric Company
Nuclear Power Plants
P.O. Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, D.C. 20555

Direct tel: 412-374-6206
Direct fax: 724-940-8505
e-mail: sisk1rb@westinghouse.com

Your ref: Docket Number 52-006
Our ref: DCP_NRC_002745

January 22, 2010

Subject: AP1000 Shield Building Structural Review Information for the NRC Meeting on 1/28/10 – 1/29/10

Enclosed is the PRELIMINARY DRAFT information (i.e. documents, presentations) for NRC review to support the proposed agenda and NRC meeting presently scheduled for January 28 - 29, 2010 (Ref. ADAMS ML093631156). Westinghouse plans to use this information to update the NRC about on-going progress and requisite status of AP1000 shield building design and process changes.

Pursuant to 10 CFR 50.30(b), proprietary and non-proprietary versions of the presentations and information are submitted as Enclosures 3, 4 and 5. Enclosure 1 is one copy of the Application for Withholding, AW-10-2729 (non-proprietary). Enclosure 2 is one copy of the associated Affidavit with Proprietary Information Notice and Copyright Notice (non-proprietary).

Enclosure 3 is the non-proprietary preliminary draft version of the status update discussion that supports the public portion of the meeting. Enclosure 4 is the proprietary preliminary draft version of the design analysis roadmap discussion to support the technical non-public portion of the meeting. Enclosure 5 is the proprietary preliminary draft version of the design margins discussion. Enclosures 4 and 5 are judged to be entirely proprietary in nature due to the predominance of analysis and testing results; so a non-proprietary version is not being provided.

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 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. The information being redacted is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public.

Correspondence with respect to the Affidavit or Application for Withholding should reference AW-10-2729 and should be addressed to James A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company, LLC, P. O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Questions or requests for additional information related to the content and preparation of this response 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,



Robert Sisk, Manager
Licensing and Customer Interface
Regulatory Affairs and Standardization

/Enclosures

1. AW-10-2729 "Application for Withholding Proprietary Information from Disclosure," dated January 22, 2010 (Non-Proprietary)
2. AW-10-2729, Affidavit, Proprietary Information Notice, Copyright Notice, dated January 22, 2010 (Non-Proprietary)
3. "AP1000 Shield Building Structural Review Update" Presentation – (Non-Proprietary)
4. "Design Analysis Roadmap" Document – (Proprietary)
5. "AP1000 Shield Building Design: Design Margins" Presentation – (Proprietary)

cc: D. Jaffe - U.S. NRC 5E
E. McKenna - U.S. NRC 5E
B. Gleaves - U.S. NRC 5E

ENCLOSURE 1

AW-10-2729

APPLICATION FOR WITHHOLDING
PROPRIETARY INFORMATION FROM DISCLOSURE



Westinghouse Electric Company
Nuclear Services
P.O. Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, D.C. 20555

Direct tel: 412-374-6206
Direct fax: 412-374-5005
e-mail: sisk1rb@westinghouse.com

Your ref: Docket Number 52-006
Our ref: AW-10-2729

January 22, 2010

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject: AP1000 Shield Building Structural Review Information for the NRC Meeting on 1/28/10 –
1/29/10

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 briefing presentations. In conformance with 10 CFR Section 2.390, Affidavit AW-10-2729 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-10-2729 and should be addressed to James 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 'Robert Sisk', written over a white background.

Robert Sisk, Manager
Licensing and Customer Interface
Regulatory Affairs and Standardization

cc: G. Bacuta - U.S. NRC

ENCLOSURE 2

Affidavit

(with Proprietary Information Notice and Copyright Notice)

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

SS

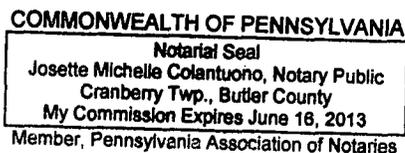
COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared **Robert Sisk**, 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:



Robert Sisk, Manager
Licensing and Customer Interface
Regulatory Affairs and Standardization

Sworn to and subscribed
before me this 22 day
of January 2010.


Notary Public

- (1) I am **Manager, Licensing and Customer Interface**, 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 the presentation entitled, "**AP1000 Shield Building Structural Review Information for the NRC Meeting on 1/28/10 - 1/29/10**", in support of the AP1000 Design Certification Amendment Application, being transmitted by Westinghouse letter (**DCP_NRC_002745**) and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse for the AP1000 Design Certification Amendment application is expected to be applicable in all licensee submittals referencing the AP1000 Design Certification and the AP1000 Design Certification Amendment Application in response to certain NRC requirements for justification of compliance of the safety system to regulations.

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

- (a) Manufacture and deliver products to utilities based on proprietary designs.

- (b) Advance the AP1000 Design and reduce the licensing risk for the application of the AP1000 Design Certification
- (c) Determine compliance with regulations and standards
- (d) Establish design requirements and specifications for the system.

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 plant construction and operation.
- (b) Westinghouse can sell support and defense of safety systems based on the technology in the reports.
- (c) The information requested to be withheld reveals the distinguishing aspects of an approach and schedule 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 digital technology safety systems 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.

ENCLOSURE 3

Westinghouse Non-Proprietary Class 3

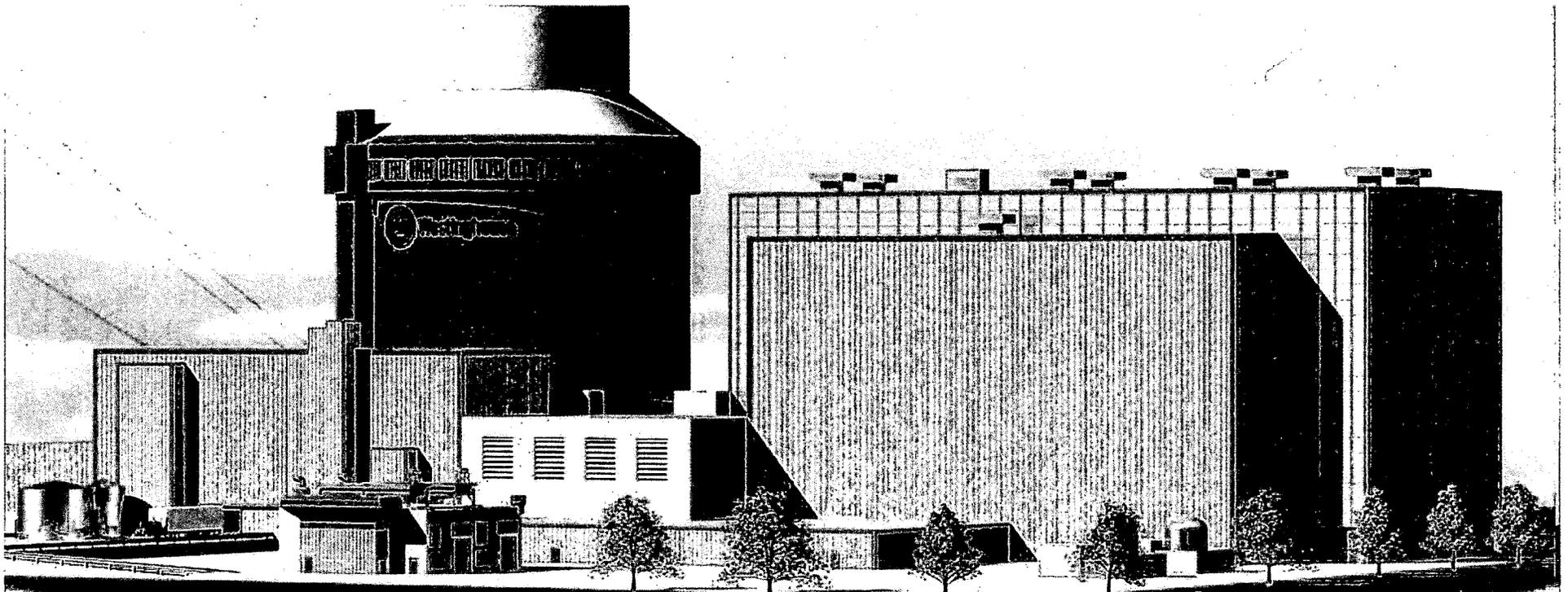
AP1000 Shield Building Structural Review Update – (Non-Proprietary)

Westinghouse Non-Proprietary Class 3
PRELIMINARY DRAFT

AP1000 Shield Building Structural Review Update

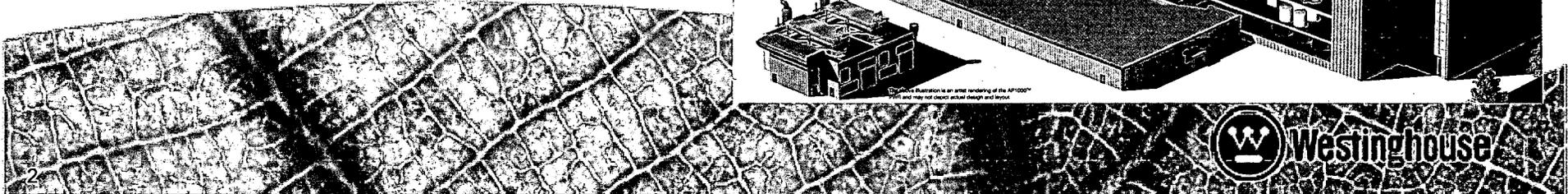
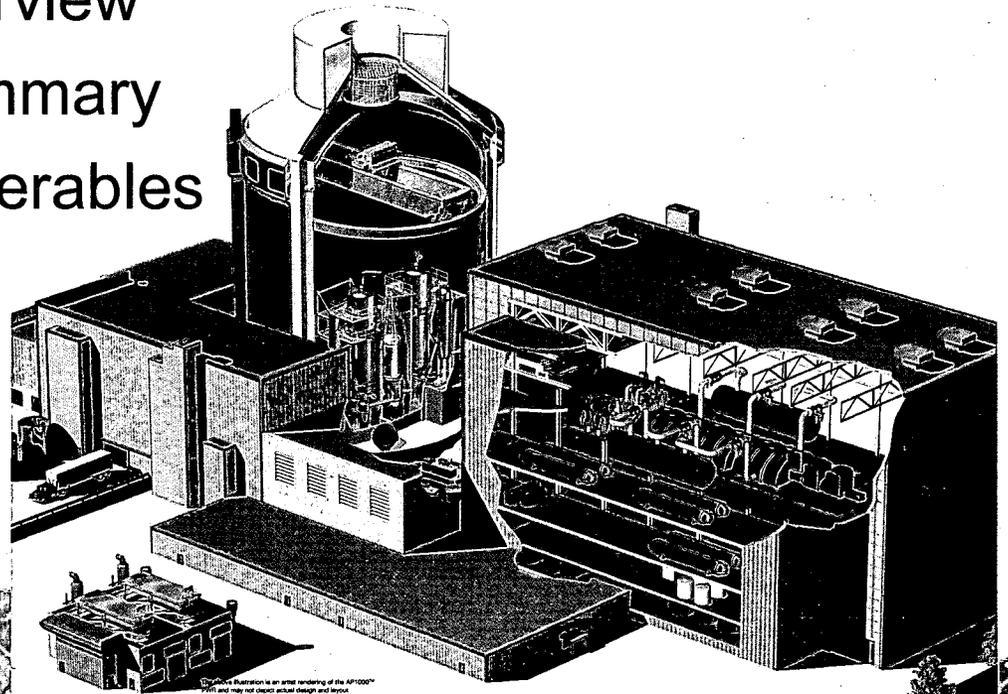
NRC PUBLIC SESSION
January 28, 2010

Bruce Bevilacqua
Westinghouse Nuclear Power Plants



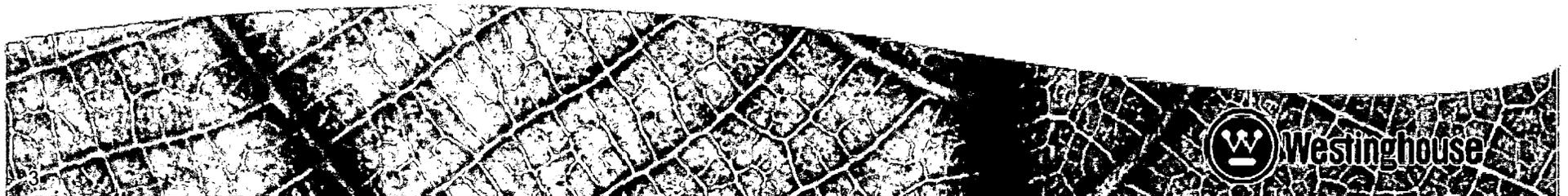
Topics of Discussion

- Purpose and Objectives
- Key NRC Assessment Issues
- Westinghouse Response to the NRC Assessment Issues
- SB Design Changes Overview
- Analysis and Testing Summary
- Schedule of Design Deliverables



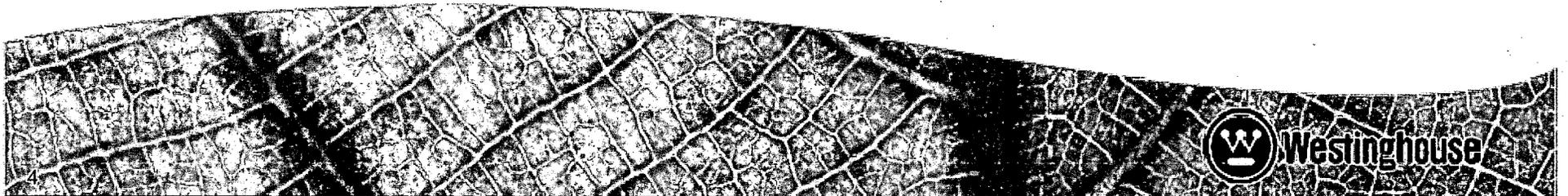
Purpose and Objectives

- Discuss Westinghouse integrated analysis/testing/design process, design modifications, and testing progress since November 2009
- Discuss Westinghouse schedule for deliverables that address the NRC SB design assessment letter from October 2009
- Demonstrate industry lessons-learned and best practices to build Concrete-Filled (Composite) Steel Modules



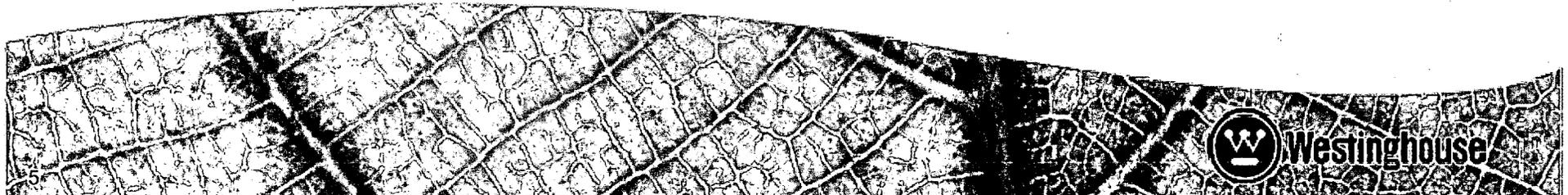
Key NRC Issues from SB Design Assessment

- Design of SC composite structure must demonstrate ability to function as a UNIT during Design Basis Events (DBE)
- Design of SC/RC connection(s) must demonstrate ability to function during a DBE
- Design of the Air-Inlets and Tension Ring region of SB must be supported by either a confirmation test OR a validated (benchmarked) analysis methodology



Westinghouse Response to Key NRC Assessment Issues

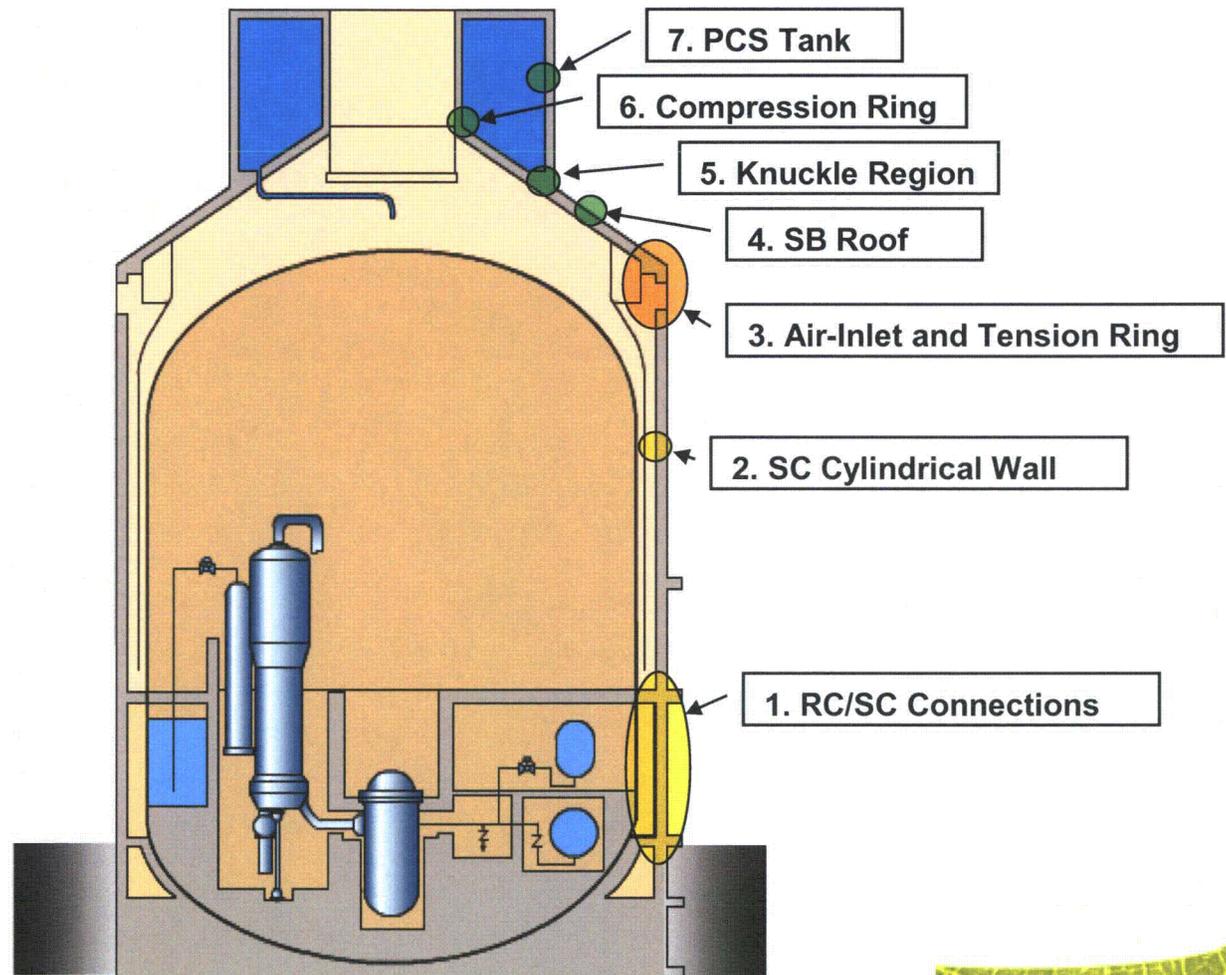
- Modified SB analysis, testing, and design sequences to answer NRC assessment issues
- Expanded Design Team to include additional outside industry Subject Matter Experts (SME) to integrate analysis, testing, and design:
 - Shaw, Purdue University, URS, Obayashi, Ansaldo, Rutgers, Twining Lab, University of Pittsburgh, RPK Consultants, MMI
- Conducted additional scaled and behavioral testing to support conclusions and demonstrate the safety of the AP1000 SB design
- Simplified design of SB air-inlet and tension ring region to improve construction, allow benchmarked non-linear analysis, and increase the large safety margin
- Details of integrated design modifications covered in telecoms and meetings with NRC (11/18, 12/21, 1/11, 1/14)



Shield Building Design Changes Overview #1

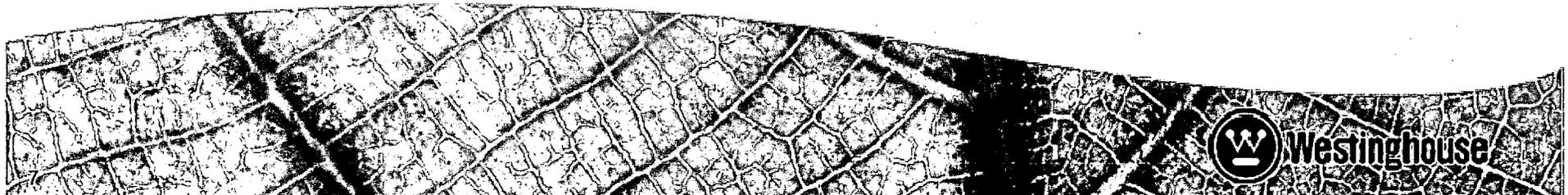
- Three main areas changed to address NRC issues and assure SB functions as an **INTEGRATED SINGLE UNIT** during design basis events and earthquakes:
 - 1) RC/SC Connections
 - 2) SC Cylindrical Wall
 - 3) Air-Inlet and Tension Ring

Note: Integrated design includes Region 4 through Region 7



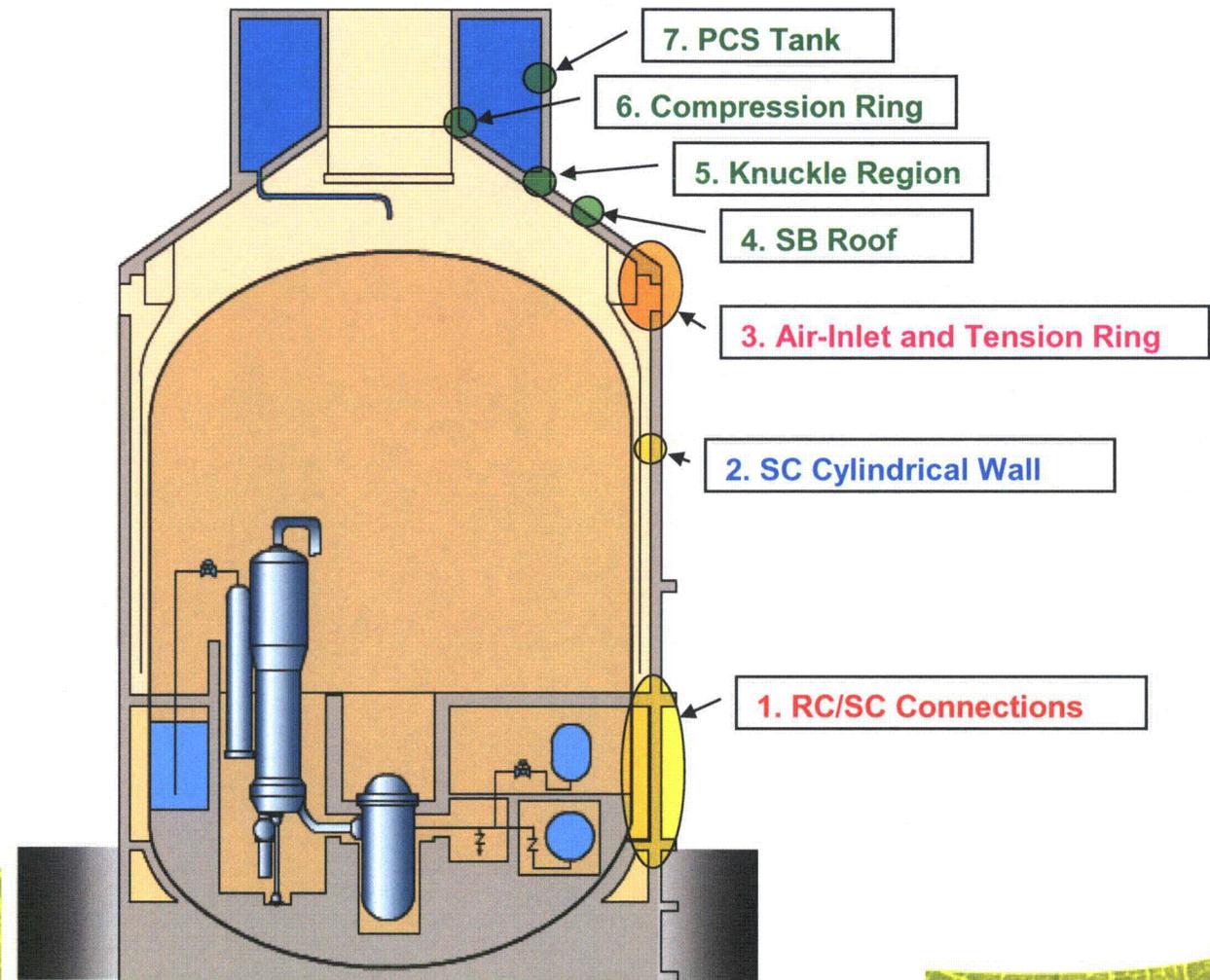
Integrated Design Response to Key NRC Issues

NRC Issue	Design Change Activities
1. SC composite wall to function as a unit during DBE	The design modifications include: <ul style="list-style-type: none">• Added shear reinforcement tie rods between two steel plates• Increased plate thickness and changed material type• Air-Inlet and Tension Ring<ul style="list-style-type: none">○ Removed stiffeners to simplify concrete placement○ Air Inlets provide added structural function between plates Reinforcement detailing to incorporate requirements from ACI 349 and ACI 318
2. Anchorage of SC Wall to RC Wall to function during DBE	Next revision of the report shall include: <ul style="list-style-type: none">• Details of RC portion of the connections• Details of successful RC-SC Test
3. Analyze or test the Air-Inlet and Tension Ring region (i.e. ring girder)	Redesigned air-inlets to increase structural concrete Redesigned air-inlets to maintain adequate airflow Air-Inlets made of pipe rather than built-up structural shapes Benchmarked non-linear finite element (FE) analyses modeled and performed Non-linear FE models represent the concrete as solid elements



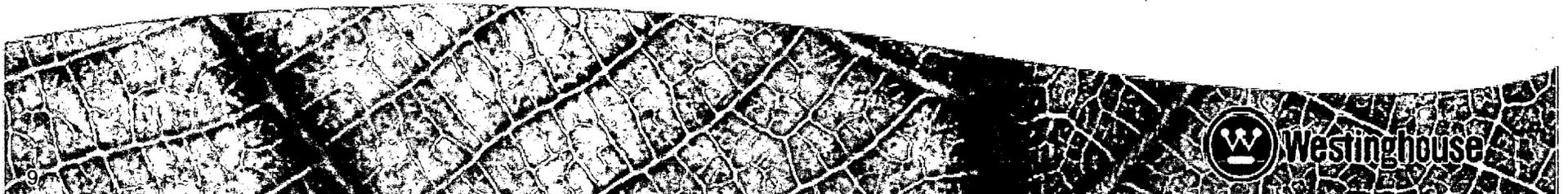
Shield Building Design Changes Overview #2

- **1. Added shear reinforcing tie-bars that tie the entire SC structure together so that the Shield Building acts as a single unit**
- **2. Increased SC plate thickness and changed to a more ductile steel to improve its strength, ductility, and resistance to buckling**
- **3. Simplified Air-Inlet and Tension Ring design to increase its structural integrity and improve the SC-RC connection to the RC roof design**



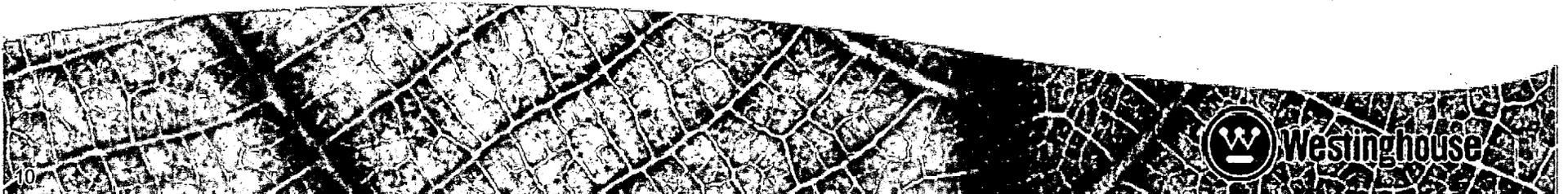
Multi-Level Design Analyses

- Phased Disciplined Analytic Approach
- Complementary Computer Codes:
 - ANSYS, SASSI, ABAQUS, LS-DYNA
- Independent SME Audit of SASSI Code
- Validation/Verification of Computer Modeling Codes
- Independent Assessment of Output Analyses



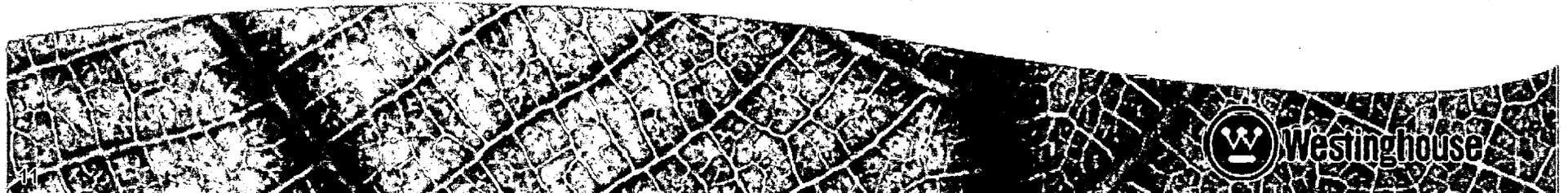
Comprehensive Testing Program

- Westinghouse has revised the test program to address NRC comments
- Completed tests on eleven specimens of various types
- Testing a broad range of material and element properties and behaviors
- Testing a broad range of design-specific geometries
- Testing a broad range of physical processes
- Testing remains on schedule



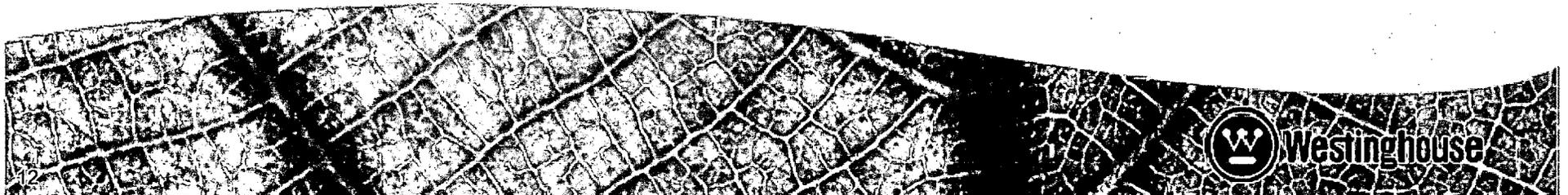
Design Document Schedule and Deliverables

- Submit Revised SB Design Report (*Rev. 1*) February 2010
- Submit Revised Seismic Report(s) March 2010
- NRC SB Technical Audit Date by NRC
- Submit SB Test Results Report April 2010
- Review schedule for reports needs to be defined



Identify Industry Lessons-Learned Best Practices for Concrete-Filled (Composite) Steel Modules

- Westinghouse remains committed to assuring both continuous safety and protection of AP1000 investments
- The certified AP1000 construction and construction inspection sequences for other existing concrete-filled (composite) steel modules are not impacted
- Westinghouse will identify candidate technologies for use during construction inspection of the Shield Building



Summary

- Westinghouse is addressing NRC review comments about the SB design in an integrated and complete fashion
- SB design changes to enhance the safety of the structure are underway and will be described in the revised AP1000 Shield Building design deliverables scheduled for submittal to the NRC in early 2010
- Westinghouse will demonstrate that the AP1000 shield building design is safe and robust with ample safety margin to meet NRC General Design Criteria regulatory requirements through analysis, benchmarking and testing

More information about the AP1000 and a copy of this presentation can be found at:

http://ap1000.westinghousenuclear.com/ap1000_nui_reg.html

