July 19, 2010

MEMORANDUM TO: Eileen M. McKenna, Chief
AP1000 Projects Branch 2
Division of New Reactor Licensing
Office of New Reactors

FROM: William C. Gleaves, Sr. Project Manager ***/RA/***
AP1000 Projects Branch 2
Division of New Reactor Licensing
Office of New Reactors

SUBJECT: SUMMARY OF A CATEGORY 1 PUBLIC MEETING HELD WITH WESTINGHOUSE ELECTRIC COMPANY REGARDING THE PROPOSED AP1000 SHIELD BUILDING DESIGN METHODOLOGY, HELD IN ROCKVILLE, MARYLAND ON June 9 – 11, 2010

The U.S. Nuclear Regulatory Commission (NRC) held a public meeting on June 9 – 11, 2010, at the Chase Suite Hotel in Rockville, Maryland. The NRC's Office of New Reactors (NRO) staff and contractors met with Westinghouse Electric Company (Westinghouse) staff, their contractors, other stakeholders, and the public to review the state of issues with the proposed AP1000 design submitted as part of their design certification amendment. Specifically, NRC staff discussed with Westinghouse the results of its review of the AP1000 Shield Building Report, Part 2, dated May 7, 2010.

The purpose of this meeting summary is to briefly describe the meeting, its participants, and to delineate the results. This meeting was noticed as a Category I public meeting in which a substantial portion of the meeting would be proprietary and therefore closed to the public. There were 57 persons in attendance at the meeting location, and approximately 9 persons attending by conference call for the public part of the meeting. When the meeting closed to discuss proprietary information, there were 53 participants, including 1 by conference call. The meeting started promptly at 8:30 a.m. EDT on June 9, 2010 and ended with the public conference call at 4:20 p.m. on June 11, 2010.

Enclosed with this memorandum are materials relevant to this meeting. The enclosures are as follows: 1) the meeting attendee list, 2) references to the proprietary technical presentations, 3) references to the non-proprietary public and technical presentation slides, available in NRC's Agencywide Document Access and Management System, public document system, 4) the non-proprietary action item list resulting from the meeting, and 5) a reference to the proprietary action item list resulting from the meeting.

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Discussion

This meeting was another in a series of follow-up meetings to the NRC's letter to Westinghouse, dated October 15, 2009. The purpose of the meeting was to discuss Westinghouse's actions related to the issues identified in the letter. Specifically, the actions taken by Westinghouse and the progress made in addressing the NRC's review issues with the AP1000 shield building.

The meeting began with comments by the NRC staff stating the belief that Westinghouse had provided information that addressed the issues identified in the October 15, 2009 letter and that the goal of the meeting was to clarify additional information needed to reach a regulatory conclusion on the issue. Mr. Bruce Bevilacqua, Vice President of Engineering for Westinghouse, made the public, non-proprietary presentation of slides titled, "AP1000™ Shield Building Structural Review Update, NRC Public Session, June 9, 2010," that is referenced in Enclosure 3. Following Mr. Bevilacqua's presentation, the meeting was opened to the public for questions of the NRC staff. The staff received a few questions that focused mainly on clarification of NRC processes and timelines, some of which I will try to characterize here: There was a question asked to clarify NRC's belief that the information submitted by Westinghouse addressed the issues in the October 15, 2009 letter; the relationship between the report that Westinghouse plans to submit on June 21, 2010 and the staff's evaluation; when the staff plans to release its review schedule of the Westinghouse submittals; and whether or not the staff was looking at other impacts of the design changes made to the shield building, such as the ability to inspect the containment structure.

Following the answering of all public questions, the public portion of the meeting, including the public conference bridge, was closed at 9:35 a.m.

After a short break, the meeting was reopened at 10:00 a.m. for the purpose of starting the technical discussions of a proprietary nature regarding specific issues that the staff needed clarification on to reach a regulatory finding on the proposed AP1000 shield building. Westinghouse presented to, and discussed with, NRC staff the proprietary slides referenced in Enclosure 2 to this memorandum.

During the proprietary portion of the meeting, the NRC staff tracked issues to be resolved, called "action items," and their resolution paths, as the meeting progressed. The final list of action items may be found in Enclosure 4 and referenced in Enclosure 5.

Westinghouse submitted all the information, that they consider to be proprietary and non-sensitive by letter dated June 30, 2010 (Reference Number DCP_NRC_002929). The staff's review and conclusion as to Westinghouse's claim of proprietary information contained in the NRC response letter found in ADAMS at document number ML101930101.

Conclusion

At the conclusion of the proprietary portion of the meeting, Westinghouse and the NRC staff agreed to all the issues discussed at the meeting for resolution by Westinghouse on a schedule to be determined later are contained in Enclosure 4 and referenced in

Enclosure 5. Westinghouse committed to provide the dates by which they would June 14, 2010..

The staff thanked everyone for their participation and the meeting ended on June 11, 2010 at 4:20 p.m. EDT.

Docket No. 52-006

Enclosures:
As stated

Enclosure 5. Westinghouse committed to provide the dates by which they would June 14, 2010.

The staff thanked everyone for their participation and the meeting ended on June 11, 2010 at 4:20 p.m. EDT.

Docket No. 52-006

Enclosures:
As stated

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ADAMS ACCESSION NO: ML101730094 NRO-001

OFFICE	LA:DNRL/NWE2	PM:DNRL/NWE2	BC:DNRL/NWE2
NAME	RButler	BGleaves	EMcKenna
DATE	7/15/10	7/16/10	7/19/10

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AP1000 Shield Building Closed Meeting
Public Meeting Attendance List
June 9 – 11, 2010

Name	Organization
Francis Akstulewicz	NRC
Laura Dudes	NRC
Brian Thomas	NRC
Ann Hodgdon	NRC
Pravin Patel	NRC
John Ma	NRC
Eileen McKenna	NRC
Terri Spicher	NRC
Billy Gleaves	NRC
Brett Tegeler	NRC
Michael Wentzel	NRC
Herman Graves	NRC
Jose Pires	NRC
B.P. Jain	NRC
Rosemary Hogan	NRC
Syed Ali	NRC
Bruce Bevilacqua	Westinghouse
Charles Brinkman	Westinghouse
Mike Corletti	Westinghouse
Rob Sisk	Westinghouse
Richard Orr	Westinghouse/consultant
Lee Tunon-Sanjur	Westinghouse
Scott Shaw	Westinghouse
John DeBlasio	Westinghouse
Tod Baker	Westinghouse
Penny Toniolo	Westinghouse
Andy Pfister	Westinghouse
Basheer Sweidan	Westinghouse
Ashley Francis	Westinghouse
Robert Kennedy	Westinghouse/consultant (SAAC)
Tom Miller	DOE
John McConaghy	Duke Energy

Enclosure 1

AP1000 Shield Building Closed Meeting
Public Meeting Attendance List
June 9 – 11, 2010

Eddie R Grant	NuStart
Don Moore	Southern Nuclear
Charles Pierce	Southern Nuclear
Alan Levin	AREVA
Yukihiko Okuda	Toshiba
Y.L. Mo	NRC/Consultant (University of Houston)
Jerome Hajjar	NRC/Consultant
Mr. Jirsa	NRC/Consultant
Frank Veccio	NRC/Consultant
W. Gene Corley	NRC Consultant
Bob Whorton	SCE&G/SCANA
Chris Keenan	Progress Energy
Bill Freebairn	Nucleonics Week
Andrew Coatsworth	NII (UK)
Sarah Jones	ND (UK)
Ian E Frith	Horizon (UK)
Stewart Gallagher	AMEC (ND-UK)
Mike Banfi	Arup (ND-UK)
Dan Shulman	Enercon
Kalle Pettersson	Vattenfall
Mike Phillips	Shaw Group
Mike Mackey	Shaw Group
David Zito	Shaw Group
Amit Varma	Purdue
Steve Byrne	SCE&G
Tom Clements (by telephone)	Friends of the Earth
Bill Jacobs (by telephone)	Vogtle
Sara Barczak (by telephone)	Southern Alliance Clean Energy
Storm Kaufman (by telephone)	Self
David Kres (by telephone)	Self
Jim Breman (by telephone)	State of Florida
Allison Rogers (by telephone)	Self
Courtney Edwards (by telephone)	State of South Carolina
Tom Hsu (by telephone)	NRC/Consultant

Westinghouse's Proprietary Technical Presentation Slides[1]

ADAMS Accession Number		**Presentation Title**
ML101940047		Enclosure 3, Shield Building Demand vs. Capacity, Out-of-Plane Shear, Notch Toughness, Tie Bar stress/strain & materials, Global Stability, SC/RC load path, concrete voids, use of self-consolidating concrete, mechanical splices, ring girder, computer code benchmarking
ML101940048		Enclosure 3, Shield Building Benchmarking and System Ductility
ML101940050		Enclosure 3, Benchmarking of computer codes, ties bars in out-of-plane shear, tie bar spacing, thermal cracking, concrete cracking, hydrodynamic loads on PCS tank

Enclosure 2

[1] These references are considered Proprietary information and are not available for viewing by the general public.

Westinghouse's Non-Proprietary Technical Presentation Slides

ADAMS Accession Number		**Presentation Title**
ML101760088		AP1000 Shield Building Structural Review Update, NRC Public Session, June 9, 2010
ML101940044		Enclosure 4, Presentations and Actions for WEC Meeting with NRC June 9 – 11 – (Non-Proprietary)
ML101940046		Westinghouse letter transmitting presentations and actions from NRC June 9 – 11, 2010, meeting

Action Item List from June 9-11 Meeting (Non-Proprietary version)

Item	Westinghouse Action	Date
1A – Demand	1. Westinghouse will provide contours plots, demand Vd/Phi*Vs and Vd/Phi*(Vc+Vs) on unfolded SC Wall	6/21/10
	2. Westinghouse will review current analysis to determine if Phi*Vs is exceeded and provide a justification	6/21/10
	3. Westinghouse will provide an assessment on minimum notch toughness & detailing to mitigate premature fracture under (SSE) earthquake for significant welds	6/21/10
	4. Westinghouse will assess the effects of cracking, show that the in-plane shear distribution near base of west wall and right above the roof at the aux building at [ ]a,c and show that the maximum in-plane shear remains within the code allowables. Westinghouse will utilize ANSYS for NI05 and [ ]a,c	6/28/10
1B – Out of Plane (OOP) Shear Capacity	5. Westinghouse will provide stress / strain test data for the tie bars with [ ]a,c and the ASTM specifications used for the construction material.	6/21/10
1C – Global Stability	6. Westinghouse will provide buckling justification and the tolerances.	6/21/10
2A – SC/RC Connection, Load Path	7. Westinghouse to clarify the design approach and the load path for the SC/RC connection. Westinghouse will walk thru individual components and the load path and confirm strengths. Describe any design changes to the SC/RC connection. (i.e. possible replacement of [ ]a,c	6/21/10
	8. Provide justification that voids in the SC/RC region will not affect load path in compression.	6/21/10
2B – SC/RC Connection, Bonding of Rods and Concrete	9. Westinghouse will verify the [ ]a,c shear friction was used and the basis for acceptability when using [ ]a,c Additionally, Westinghouse will address the limiting failure mode and check to ensure in the [ ]a,c If changes are made from [ ]a,c will provide details of those changes. In addition Westinghouse will provide the technical justification [ ]a,c for a higher shear friction capacity factor to be used for purposes of	6/21/10

Item	Westinghouse Action	Date
	beyond design basis.	
	10. Clarify use of SCC and the specific locations where it will be used for Shield Building.	6/21/10
2C – Qualification of Mechanical Splices	11. Consider use of ACI 318-08 CH 21. Indicate specific type used for Shield Building and if it is type 1, Westinghouse will provide a justification. Provide qualification and production criteria.	6/21/10
3 – Ring Girder/ Air Inlet	12. Provide a typical load case at SSE to show that the cross sectional forces for both the Standard (ANSYS) and Confirmatory [ ]a,c analyses.	6/28/10
	13. Westinghouse will perform a calculation to address shear friction loads at the air inlet connection and construction joint to the tension ring.	6/21/10
	14. Show a calculation of that the capacity of the shear ties are adequate to address the transition of the [ ]a,c wall.	6/21/10
4 – Other		
Issue 1 – Benchmarking and System Ductility		
1. ABAQUS	15. Present analysis of test specimens using material [ ]a,c Indicate strain limits and provide the points, where a [ ]a,c would occur.	6/21/10
2. LS-DYNA	16. Provide the benchmarking of the [ ]a,c model to the staff.	6/21/10
3. Handoff of L2 to L3	17. Provide the handoff procedure used from the [ ]a,c	6/21/10
4. OOP Shear Capacity for Tie Bars	18. For tie bar determine whether [ ]a,c	6/21/10
Issue 2 - OOP Shear Capacity tie bars spaced at 7", 8"	19. Provide the calculation basis for the tie bar spacing other than those that were explicitly tested [ ]a,c Identify the regions where these nonstandard spacing were used, and demonstrate the capacity vs. demand in these regions and whether it is large.	6/21/10
Issue 3 - Thermal cracking problem	20. Westinghouse to review the crack width assumption calculation used to evaluate the effect on design. • Cement content • Coefficient of thermal expansion	6/28/10

Item	Westinghouse Action	Date
	• Concrete volumetric expansion etc.	

Action Item List from June 9 – 11, 2010 Meeting (Proprietary)[2]

ADAMS Accession Number		**Presentation Title**
ML101790101		Action Items from June 9-11, 2010, AP1000 Shield Building Meeting

Enclosure 5

[2] This list is considered Proprietary information and is not available for viewing by the general public.