May 1, 2009

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
AP1000 Projects Branch 2 ***/RA/***
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 IN ROCKVILLE, MARYLAND ON MARCH 18-19, 2009

The U.S. Nuclear Regulatory Commission (NRC) held a public meeting on March 18 and 19, 2009, at the Westinghouse Washington Operations office on Twinbrook Parkway in Rockville, Maryland. The Office of New Reactors (NRO) met with Westinghouse Electric Company (Westinghouse) representatives to discuss issues with the proposed AP1000 design submitted as part of their design certification amendment (DCA).

The discussions resulted in action items listed in an enclosure to this memorandum. Enclosed with this memorandum are the summary, as well as the participant and the materials relevant to this meeting. The enclosures are as follows: (1) meeting attendee list, (2) non-proprietary technical, (3) proprietary technical presentation slides, and (4) action items list.

This Category I public meeting was held to discuss the NRC review of the Westinghouse application for amendment to the AP1000 Design Certification. Specifically, the participants discussed the technical issues related to the AP1000 proposed shield building design. The foundation for the meeting was the NRC's requests for additional information that were written on the proposed shield building design. This Category I public meeting was held at the Westinghouse Washington Operations Office, located at 12300 Twinbrook Parkway, Suite 330, Rockville, Maryland.

The purpose of this meeting summary is to briefly describe the meeting, its participants, and to delineate the results. There were 25 participants in attendance at the meeting location of which 2 participants were from the general public. There was one attendee by conference call. See Enclosure 1 for the list of attendees. The meeting started promptly at 8:30 a.m. EST. on March 18, 2009 and ended at 3:45 p.m. on March 19, 2009.

CONTACT: Billy Gleaves, NRO/DNRL
(301) 415-5848
bill.gleaves@nrc.gov

Discussion

Following the introductions of the attendees at the meeting and on the NRC telephone bridge, the Director of the NRC's Division of Engineering, Tom Bergman, made the first statements to kick off the meeting. It is important to note that Mr. Bergman stated the importance that it was a technical meeting and that issues of design finality be discussed in separate meetings.

Westinghouse began the meeting presentations by discussing prepared information, in slide format, for all to view and discuss. Copies of the non-sensitive Westinghouse presentations (mentioned below) are provided in Enclosure 2.

Ed Cummins of Westinghouse made the first presentation on "Shield Building Focus," dated March 18 -19, 2009, in which he reviewed changes to the AP1000 shield building from reinforced concrete to modular construction, changes to shield building venting, and associated roof design changes.

Don Lindgren of Westinghouse made the next presentation on "Shield Building Modular Construction Regulatory Basis," dated March 18, 2009. In this presentation, Mr. Lindgren discussed the current Westinghouse activities to support NRC's review of the AP1000 DCA.

The NRC staff then reviewed their primary concerns: 1) the shield building roof, 2) the shield building modular walls, 3) the connection between the shield building modular walls and the conventional steel-reinforced concrete construction. In addition the staff noted other concerns such as the concrete inspection program discussed in ACI-349.

At about 10:00 a.m., based on the information to be provided by Westinghouse at this point, the non-proprietary portion of the meeting and the conference bridge was closed and re-opened as a proprietary meeting. All proprietary presentation slides are included in the proprietary Enclosure 3 to this summary.

Narinda Prasad and Richard Orr of Westinghouse then discussed a presentation titled, "Enhanced Shield Building Design Overview." This presentation included proprietary information. In the presentation, Mr. Prasad discussed the nuclear island general layout, why Westinghouse made a design enhancement, the regulatory criteria for changes to the shield building, modular construction worldwide, and the Japanese design requirements contained in the JEAG design guide, which is specifically written for nuclear applications. They also discussed technical details of Westinghouse's design methodology for the proposed modular shield building wall construction. The NRC staff discussed its questions on the Westinghouse methodology.

Ari Danay of Westinghouse discussed the presentation titled, "SC Construction Methodology Related to Cylindrical Wall, Including Behavior & Experimental Test Results." This presentation included proprietary information. Mr. Danay discussed two module studies and how they relate to the Westinghouse design methodology: GW-SUP-003, Rev. 2, "Structural Analysis Methodology for Steel-Concrete Composite Panels w/Welded Shear Studs," and GW-SUP-005, Rev. 1, "Behavior Studies of Concrete Filled Structural Modules." Westinghouse committed to make these studies

available for NRC review. In addition, Mr. Danay discussed modular behavior studies in Korea and Japan. He also discussed the Japanese technical guideline published by the Architectural Institute of Japan - JEAG 4618-2005. Following this discussion, the NRC staff requested information as to how Westinghouse applied this information to the proposed AP1000 design. The NRC staff requested information on exactly how Westinghouse applied parts of ACI 349 and AISC N690. At the end of Day 1, the Westinghouse staff distributed a list of draft open items from the discussions.

Day 2 was a continuation of the proprietary discussions from Day 1.

Mr. Danay discussed a presentation titled, “Basemat Connections Design.” This presentation included proprietary information. NRC staff indicated that, in order to facilitate the staff review, Westinghouse must review the level of detail for the shield building methodology described in the DCD and make adjustments to the level of detail, with discussions such as are occurring during this meeting, as a guide.

Mr. Guiseppe of Westinghouse discussed his presentation titled, “Enhanced Shield Building Roof.” This presentation included proprietary information. Mr. Richard Orr discussed what Westinghouse calls the half SC construction, which is the modified modular construction that is proposed for the shield building roof, among others. The participants then discussed at length the technical details of the design methodology and the differences and similarities between the proposed design and the approved methodology for the design of the AP1000 control room ceiling.

Mr. Prasad then discussed a presentation titled, “Enhanced Shield Building Coatings.” This presentation included proprietary information. In this presentation, he discussed the types and bases for selecting the protective coatings for the AP1000 Shield building.

Also discussed at this time was NRC staffs concerns regarding fire protection and concrete inspection requirements.

Conclusion

In general, the staff found the meeting to be effective and necessary to understand Westinghouse's approach and use of design methods for the AP1000 Shield Building. At the conclusion of the meeting, the NRC staff reviewed the draft list of action items from the meeting and agreed to have another conference call on March 24, 2009 at 3:00 p.m. to settle both the final action items and the due dates for those items.

The staff opened the floor to the general public in attendance in order to receive their comments. Hearing none, the meeting was closed at 4:00 p.m.

Docket No. 52-006

Enclosure:
As stated

Conclusion

In general, the staff found the meeting to be effective and necessary to understand Westinghouse's approach and use of design methods for the AP1000 Shield Building. At the conclusion of the meeting, the NRC staff reviewed the draft list of action items from the meeting and agreed to have another conference call on March 24, 2009 at 3:00 p.m. to settle both the final action items and the due dates for those items.

The staff opened the floor to the general public in attendance in order to receive their comments. Hearing none, the meeting was closed at 4:00 p.m.

Docket No. 52-006

Enclosure:
As stated

DISTRIBUTION:
PUBLIC
RidsNroNWE2 BGleaves RidsAcrsAcnwMailCenter
RidsOgcMailCenter RidsNroSeb1 Pravin Patel

ADAMS ACCESSION NO: ML091120606 Package

OFFICE	LA:NWE2:DNRL:NRO	PM:NWE2:DNRL:NRO	BC:NWE2: DNRL:NRO
NAME	RButler	BGleaves	EMcKenna
DATE	04/24/2009	04/29/2009	05/01/2009

OFFICIAL RECORD COPY

Meeting Attendance List

Name	Organization
Rob Sisk	Westinghouse
Eileen McKenna	NRC
Billy Gleaves	NRC
John McConaghy	NuStart/Duke
Keith Coogler	Westinghouse
Francis Akstulewicz	NRC
Masaki Kawashima	Obayashi
Charles Ader	NRC
John Monninger	NRC
Barton Cowan	Westinghouse
Bruce Ebbeson	Shaw Group
Narendra Prasad	Westinghouse
Jin Chung	MNES
Bret Tegeler	NRC
Don Lindgren	Westinghouse
Ari Danay	Westinghouse
Ed Cummins	Westinghouse
Don Peck	Westinghouse
Richard Orr	Westinghouse
Tom Bergman	NRC
Eddie R Grant	NuStart
Laura Dudes	NRC
Pravin Patel	NRC
John Ma	NRC
Brian Thomas	NRC
Jessica Bielecki	NRC
Giovanni Di Giuseppe	Ansaldo
Abdul Sheikh	NRC

Teleconference Attendees

Name	Organization
Leonardo Tunon-Sanjur	Westinghouse

Enclosure 1

Westinghouse Non-Proprietary Technical Presentation Slides

Adams Accession Number	Title
1. ML091130379	Shield Building Focus Meeting
2. ML091140112	Shield Building Modular Construction Regulatory Basis

Enclosure 2

Westinghouse's Proprietary Technical Presentation Slides

Adams Accession Number	Title
1. ML091120620	Methodology for Steel Composite Modules (SC) Analysis of Shield Building
2 ML091120769	Conical Roof Composite Member Verification
3. ML091130163	Design Method for Shield Building Steel Plate Construction
4. ML091130216	Enhanced Shield Building Design Overview
5. ML091130711	Enhanced Shield Building Cylindrical Wall
6. ML091130713	Base Detail For Structural Modules
8. ML091140206	Construction Sequence and Concrete Placement

Draft List of Action Items as Compiled at the Meeting

Action Item No/Description	Assignee	Due Date
1. Clarify the use of ACI-349 and AISC N-690. Describe parts used/not used and extended.	Westinghouse	TBD. By Conference Call on 3/24 @ 3pm
2. Provide Copies of the presentations.	Westinghouse	"
3. Provide an evaluation of use of isotropic assumption versus orthotropic assumption for Building analysis. Provide a calculation for Rockville office.	Westinghouse	"
4. Provide AP600 documents on module methodology GW-SUP-003 and GW-SUP-005 for NRC review.	Westinghouse	"
5. Provide for NRC review the calculation that compares the Japanese test data to ACI-349 requirements. Place calculation in Rockville office.	Westinghouse	"
6. Discuss the potential for buckling of surface plates in compression. Include response in Action Item 1.	Westinghouse	"
7. Prepare assessment of recent test reports to demonstrate conservatism of design methodology. Include in-plane and out of plane.	Westinghouse	"
8. Provide access to translation of JEAG4618-2005.	Westinghouse	"
9. Provide a better description of the design method for the modular wall connection.	Westinghouse	"
10. Describe how cracking, and the potential for rebar corrosion, at the bottom of the SC construction is addressed. Include sealing requirements.	Westinghouse	"
11. Clarify the use of ACI-349 and AISC N-690 for the shield building roof. What parts are being used, what is extended, how do we modify, and how do we support with testing.	Westinghouse	"
12. Define the inspection plan for modular construction. Include conformance (and deviations from) ACI-349 inspection requirements.	Westinghouse	"
13. Westinghouse will show staff where wet concrete stress not being added to design stress was previously approved.	Westinghouse	"