Westinghouse

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 No. 52-006
Our ref: DCP_NRC_002789

February 23, 2010

Subject: AP1000 Response to Proposed Open Item (Chapter 12)

Westinghouse is submitting the following responses to the NRC open item (OI) on Chapter 12. These proposed open item response are submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in these responses is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification and the AP1000 Design Certification Amendment Application.

Enclosure 1 provides the response for the following proposed Open Item(s):

OI-SRP12.3-CHPB-01 R1

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,

D. A. Lindgren / FOR

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

/Enclosure

1. Response to Proposed Open Item (Chapter 12)

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NRO

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cc:	D. Jaffe	-	U.S. NRC	1E
	E. McKenna	-	U.S. NRC	1E
	S. Sanders	-	U.S. NRC	1E
	T. Spink	-	TVA	1E
	P. Hastings	-	Duke Power	1E
	R. Kitchen	-	Progress Energy	1E
	A. Monroe	-	SCANA	1E
	P. Jacobs	-	Florida Power & Light	1E
	C. Pierce	-	Southern Company	1E
	E. Schmiech	-	Westinghouse	1E
	G. Zinke	-	NuStart/Entergy	1E
	R. Grumbir	-	NuStart	1E
	T. Ray	-	Westinghouse	1E

ENCLOSURE 1

AP1000 Response to Proposed Open Item (Chapter 3)

AP1000 TECHNICAL REPORT REVIEW

Response to Open Item (OI)

RAI Response Number: OI-SRP12.3-CHPB-01
Revision: 1

Question:

In its review of DCD Section 12.3, the staff identified areas in which additional information was necessary to complete its evaluation of the applicant's change. In Tier 2 DCD Subsection 12.3.1.1.1, the staff noted that the applicants' description now includes an integrated head package which combines the head lifting rig, control and gray rod drive mechanisms, lift columns, control rod drive mechanism cooling system and power and instrumentation cabling. Also the conventional top mounted instrumentation ports/conoseal thermocouple arrangement has been replaced with a combination thermocouple /incore detector system. The description of the change to include the integrated head package does not provide sufficient information to determine if the Containment area radiation zones are affected or the implementation results in an increase or decrease in the refueling dose estimates.

In Revision 17, Tier 2, Figure 12.3-1 (Sheet 8 of 16), Radiation Zones, Normal Operation / Shutdown Nuclear Island, EL 135'-3" indicates that the RV Head stand area may be a Plant Radiation Zone V (less than or equal to 1 Rem/hr) when the RV head is in the stand, which is defined by Figure 12.3-1 (Sheet 1 of 16). In Revision 16, the same drawing indicated that the area for the RV stand would be a Plant Radiation Zone II, (less than or equal to 2.5 mrem/hr) There are no supporting calculations to show that the Integrated Head Package will result in a dose rate of less than or equal to the original RV head configuration, or how this change is ALARA.

Table 12.4-12, Dose Estimate for Refueling Activities, has not changed as a result of the addition of the design change implementing the integrated head package.

AP1000 DCA, Revision 17, incorporated the Westinghouse Topical Report APP-GW-GLE-016, Revision 0, "Impact of In-core Instrumentation Grid, Quicklocs and Changes to Integrated Head Package" This report did not describe any changes to Section 12.4 and the dose assessment.

a) Provide a complete description of the how the placement of integrated head package and the revised and associated equipment in the Containment building meets the acceptance criteria of SRP 12.3-4.

b) Describe the effect on occupational exposures in and adjacent to the Containment building. Include this information in the DCD and provide a markup of the text and appropriate revised radiation zone maps and dose estimate tables in your response.

Additional Westinghouse Response:

This Revision 1 response to OI-SRP12.3-CHPB-01 is only being provided as a supplement to the Revision 0 response; no new or additional information is provided. All DCD changes shown in the Revision 0 response are being incorporated as previously shown. (The original response to OI-SRP12.3-CHPB-01, Revision 0 is not reproduced here.)

The following DCD sections from the Rev. 0 response are repeated below with the redline strike-out changes incorporated for clarification:

Section 12.4.1.7, "Overall Plant Doses"
Table 12.4-6, "Dose Estimate for Inservice Inspection"
Table 12.4-12, "Dose Estimate for Refueling Activities"

Design Control Document (DCD) Revisions:
See the following pages as described above.

PRA Revision:
None.

Technical Report (TR) Revision:
None.

12.4.1.7 Overall Plant Doses

The estimated annual personnel doses associated with the six activity categories discussed above are summarized below:

Category	Percent of Total	Estimated Annual (man-rem)
Reactor operations and surveillance	21.8	13.8
Routine inspection and maintenance	19.2	12.1
Inservice inspection	22.7	14.3
Special maintenance	23.7	15.0
Waste processing	8.2	5.2
Refueling	4.4	2.8
Total	100.0	63.2

These dose estimates are based on operation with an 18-month fuel cycle and are bounding for operation with a 24-month fuel cycle.

Table 12.4-6

DOSE ESTIMATE FOR INSERVICE INSPECTION

Component	Annual Dose (man-rem)
Valve Bodies and Boltings	6.10
SG Primary Side Inspections	1.25
Reactor Vessel and Head	0.31
Reactor Coolant Loop Piping and Supports	1.45
SG Shell	0.12
Other Piping	2.83
Heat Exchanger Shells	0.73
Pressurizer Shell	1.20
Pumps	0.11
Tank Shells and Supports	0.15
Filter Housings and Supports	0.06
Total Dose:	14.3

Table 12.4-12

DOSE ESTIMATE FOR REFUELING ACTIVITIES

Refueling Operations Work Description	Dose (man-rem)
Preparation	0.1
Reactor Disassembly	1.4
Fuel Shuffle	0.5
Reactor Reassembly	2.2
Clean-Up	<0.1
Total Refueling Dose:	4.2
Average Annual Dose:	[a]2.8

Note:

a. Based on an 18-month fuel cycle. The stated dose bounds operation with a 24-month fuel cycle.