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U.S. Nuclear Regulatory Commission
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Your ref: Project Number 740
Our ref: DCP/NRC1868

April 13, 2007

Subject: AP1000 COL Response to Request for Additional Information (TR #61)

In support of Combined License application pre-application activities, Westinghouse is submitting responses to NRC requests for additional information (RAI) on AP1000 Standard Combined License Technical Report 61, APP-GW-GLN-014, Rev. 0, AP1000 Integrated Head Package. These RAI responses are submitted as part of the NuStart Bellefonte COL Project (NRC Project Number 740). The information included in the responses is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification.

The responses are provided for Requests for additional information TR61-1, TR61-2, TR61-3, and TR61-4, transmitted in NRC letter dated March 29, 2007 from Steven D. Bloom to Andrea Sterdis, Subject: Westinghouse AP1000 Combined License (COL) Pre-application Technical Report 61 – Request for Additional Information (TAC NO. MD3607).

Pursuant to 10 CFR 50.30(b), the responses to requests for additional information on Technical Report 61 are submitted as Enclosure 1 under the attached Oath of Affirmation.

It is expected that when the RAIs on Technical Report 61 are complete, the technical report will be revised as indicated in the responses and submitted to the NRC. The RAI responses will be included in the document.

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. J. Hutchings for

A. Sterdis, Manager
Licensing and Customer Interface
Regulatory Affairs and Standardization

00110-psa.doc

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/Attachment

1. "Oath of Affirmation," dated April 13, 2007

/Enclosure

1. Response to Requests for Additional Information on Technical Report No. 61

cc:	S. Bloom	-	U.S. NRC	1E	1A
	S. Coffin	-	U.S. NRC	1E	1A
	G. Curtis	-	TVA	1E	1A
	P. Grendys	-	Westinghouse	1E	1A
	P. Hastings	-	Duke Power	1E	1A
	C. Ionescu	-	Progress Energy	1E	1A
	D. Lindgren	-	Westinghouse	1E	1A
	A. Monroe	-	SCANA	1E	1A
	M. Moran	-	Florida Power & Light	1E	1A
	C. Pierce	-	Southern Company	1E	1A
	E. Schmiech	-	Westinghouse	1E	1A
	G. Zinke	-	NuStart/Entergy	1E	1A

ATTACHMENT 1

"Oath of Affirmation"

ATTACHMENT 1

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:	)
NuStart Bellefonte COL Project	)
NRC Project Number 740	)

APPLICATION FOR REVIEW OF
"AP1000 GENERAL COMBINED LICENSE INFORMATION"
FOR COL APPLICATION PRE-APPLICATION REVIEW

W. E. Cummins, being duly sworn, states that he is Vice President, Regulatory Affairs & Standardization, for Westinghouse Electric Company; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission this document; that all statements made and matters set forth therein are true and correct to the best of his knowledge, information and belief.

W. E. Cummins
Vice President
Regulatory Affairs & Standardization

Subscribed and sworn to
before me this 13th day
of April 2007.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Debra McCarthy, Notary Public
Monroeville Boro, Allegheny County
My Commission Expires Aug. 31, 2009
Member, Pennsylvania Association of Notaries

Debra McCarthy
Notary Public

ENCLOSURE 1

Responses to Request for Additional Information on Technical Report No. 61

RAI-TR61-001 through RAI-TR61-004

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-TR61-001
Revision: 0

Question:

It is stated in AP1000 Licensing Design Change Document that the CRDM cooling fans would be relocated. Provide the dimensions and weights of the Integrated Head Package and the CRDM cooling fans. Also provide drawings (or schematics) to indicate the new proposed locations of the cooling fans and their support structure. The drawings should indicate the air flow path from the CRDM to the cooling fans and the increased distances of the fans in the revised location.

Westinghouse Response:

The IHP with the lift rig (including margin) will weigh less than 600,000 pounds. 600,000 pounds is the critical lift weight (maximum) for the polar crane. The weight of the reactor vessel head with CRDMs and ICI guide tubes is approximately 250,000 lbs. The balance of the IHP's weight is approximately 247,000 pounds. The IHP is approximately 94.7 feet high from the mating surface of the reactor vessel head to the top of the lifting rig structure (65.1 feet of this is the lifting rig which is removed during plant operation and stored on the permanent head stand in containment). The diameter of the IHP shroud is 163 inches. The four CRDM Cooling fans are located on a removable structure, the CRDM Cooling Fan Platform Module CH-40. The general layout of the CH-40 module is provided in the attached drawing. This drawing is subject to change based on the completion of the final design and analysis of the CRDM Cooling System.

Figure 1 show the airflow path on the IHP itself. The air enters the IHP at the reactor vessel head elevation from the opened–during-operation access doors and is sucked upward parallel to the CRDMs before exiting two ducts 180 degrees apart on the IHP. The access doors are locked shut during refueling operations.

These two ducts on the IHP connect to short ducts on the CH-40 module via retractable elastomer duct connectors. The short ducts on the CH-40 module feed plenums below the cooling fans. Each CH-40 plenum feeds two cooling fans. The air is sucked upward through a cooling fan past a backdraft damper and through an outlet diffuser to the containment atmosphere.

The distance from the centerline of the duct on the IHP to the plenum on the CH-40 module is 65 inches. The total length of the plenums under the CRDM Cooling Fans are 88 inches.
A CRDM cooling fan is 36 inches diameter (at the outlet diffuser) and 73 inches high (including the seismic isolator pad) and weighs approximately 2,500 pounds.

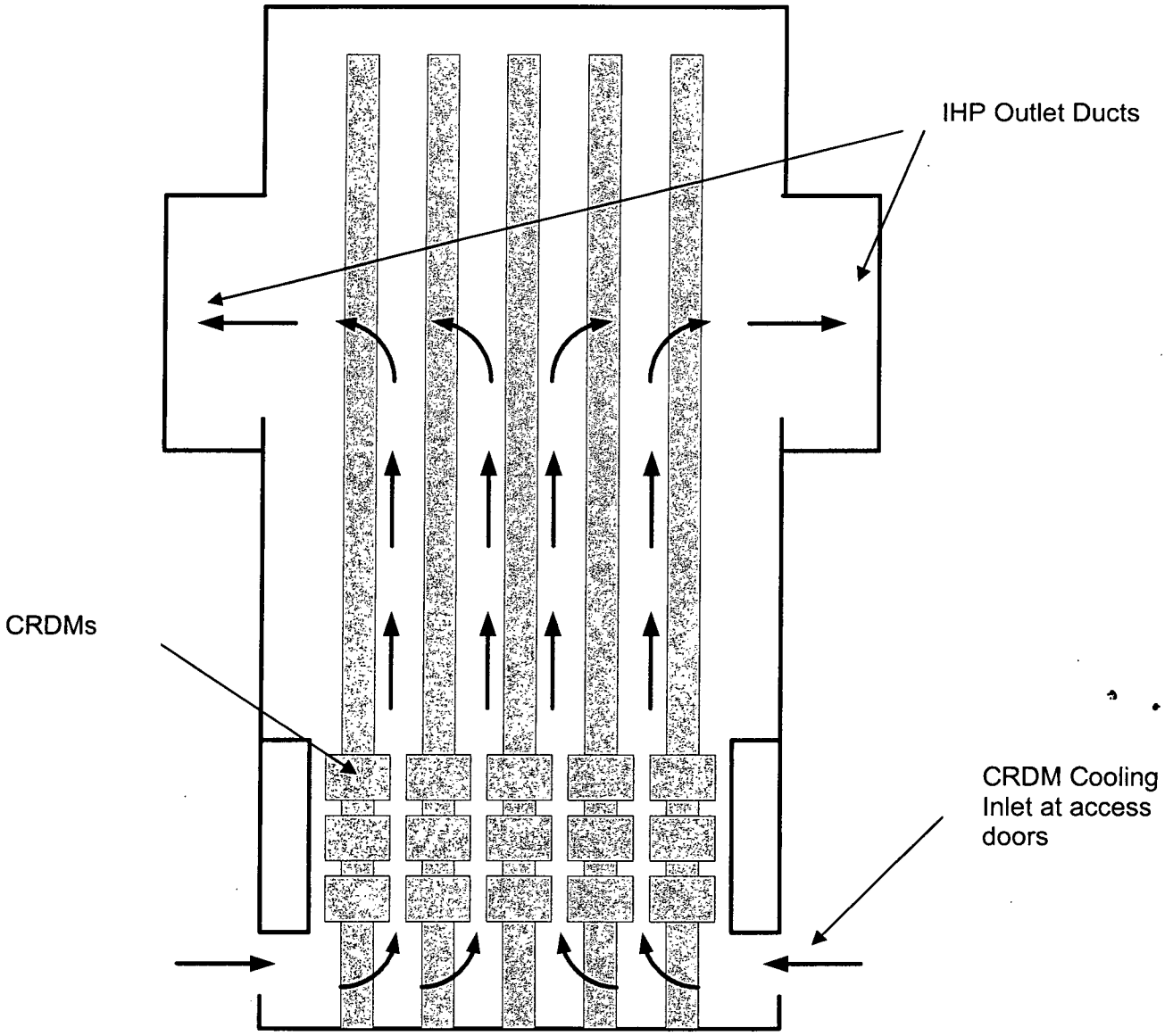

Figure 1 CRDM Cooling Air Flow Path in IHP

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

Reference:

1. APP-GW-GLN-014, Revision 0, "Integrated Head Design," (Technical Report Number 61)
2. Westinghouse Drawing APP-CH40-V1-001, Revision A "Module 1152-CH-40 CRDM Cooling Fan Platform Module Isometric View"

Design Control Document (DCD) Revision:
None

PRA Revision:
None

Technical Report (TR) Revision:
None

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-TR61-002
Revision: 0

Question:

There is no discussion in the AP1000 Licensing Design Change Document regarding the effectiveness of the cooling fans in their new location. Provide any analyses or tests that the applicant may have performed to ensure that there is no decrease in the effectiveness of the cooling function of the fans as a result of their new configuration.

Westinghouse Response:
The CRDM Cooling Fans in their new location will meet or exceed the cooling requirements presented in response to TR61-4. To improve airflow, unnecessary internal baffling in the IHP has been removed to greatly reduce pressure drop. Detail design and analysis is being performed on the CRDM Cooling system using a computational fluid dynamics program (CFD). The specific CFD program is ANSYS CFX.
Previous simplified head upgrades on many Westinghouse operating plants have shown the predicted computer simulations results closely match measured flow/temperature in the CRDM cooling path. The AP1000 will have a post-acceptance CRDM cooling airflow test criteria. Prior to startup, the duct airflow to the CRDM Fans will be measured to determine that the airflow criteria are met.

Reference:

1. APP-GW-GLN-014, Revision 0, "Integrated Head Design," (Technical Report Number 61)
2. ANSYS, CFX Version 10.

Design Control Document (DCD) Revision:
None

PRA Revision:
None

Technical Report (TR) Revision:
None

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-TR61-003
Revision: 0

Question:

Placement of heavy shield doors has been cited as one of the reasons in the AP1000 Licensing Design Change Document for relocating the cooling fans. Provide an explanation as to why no shield doors would now have to be placed where the fan ducts are disconnected in the revised configuration.

Westinghouse Response:

In the previous configuration of the Integrated Head Package (IHP), very large CRDM Cooling Fans were mounted at mid-height directly in 58 inch by 58 inch cutouts of the five-inch thick radiation shield of the IHP. To make up for the five inches of shielding during In-Core-Instrumentation Thimble Assembly removal and insertion, thick shield doors were necessary. In the revised configuration, the CRDM cooling air is brought in through open-during-operation shield doors at the bottom of the IHP. These shield doors are locked close during refueling operations. The CRDM airflow exits near the top of the IHP to a shielded plenum ring. The shielded plenum ring is higher on the IHP and a greater distance away from the radiation source (the activated In-Core-Instrumentation Thimble Assemblies) reducing the potential radiation exposure. This design feature eliminates the need for shield door placement where the fan ducts are disconnected in the revised configuration.

Reference:

1. APP-GW-GLN-014, Revision 0, "Integrated Head Design," (Technical Report Number 61)

Design Control Document (DCD) Revision:
None

PRA Revision:
None

Technical Report (TR) Revision:
None

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-TR61-004
Revision: 0

Question:

There is no discussion in the AP1000 Licensing Design Change Document regarding the cooling requirements of the CRDM. Provide the acceptance criteria for the cooling requirements of the CRDM (Temperature limits or ranges etc).

Westinghouse Response:

The acceptance criteria for cooling requirements are found in the AP1000 Control Rod Drive Mechanism (CRDM) Design Specification (APP-MV11-Z0-001, Revision B) subsection 6.1.23. The ventilation air flow supplied to each CRDM will have an average velocity of 50 feet per second and a minimum velocity of 30 feet per second at any given point along the CRDM coil stack. The cooling air shall maintain the temperature of the coil contained within stack below 392°F during both normal operating conditions and when the reactor is in hot standby.

Reference:

1. APP-GW-GLN-014, Revision 0, "Integrated Head Design," (Technical Report Number 61)
2. APP-MV11-Z0-001, Revision B, "AP1000 Control Rod Drive Mechanism (CRDM) Design Specification."

Design Control Document (DCD) Revision:
None

PRA Revision:
None

Technical Report (TR) Revision:
None