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: 412-374-5005
e-mail: sisk1rb@westinghouse.com

Your ref: Docket No. 52-006
Our ref: DCP/NRC2229

August 15, 2008

Subject: AP1000 Response to Request for Additional Information (SRP16.1.1)

Westinghouse is submitting a response to the NRC request for additional information (RAI) on SRP Section 16.1.1. This RAI response is submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in the response is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification and the AP1000 Design Certification Amendment Application.

A response is provided for RAI-SRP16.1.1-SEB1-01 as sent in an email from Billy Gleaves to Sam Adams dated May 16, 2008. This response completes all requests received to date for SRP Section 16.1.1.

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

/Enclosure

1. Response to Request for Additional Information on SRP Section 16.1.1

D063
NRO

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

ENCLOSURE 1

Response to Request for Additional Information on SRP Section 16.1.1

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP16.1.1-SEB1-01
Revision: 0

Question:

The open items of TSs 3.9.5 and 3.9.6 on containment equipment hatch bolts in connection with DCD 16.1.1, Combined License Information require four bolts being equally spaced with no specifications on bolts' material, dimensions and locations given (see TR 74A, Revision 1).

Provide a full design of the hatch bolts capable of supporting the hatch dead weight and its associated loads, together with a sketch of the hatch showing bolts' locations and specifications, or a justification as why this is not necessary.

1. Concern:

The containment equipment hatches, part of the containment pressure boundary, provide access for moving large equipment into and out of the containment. If closed, the equipment hatch must be held in place by at least four bolts. Good engineering practice further dictates that the bolts be spaced to carry equal amount of load. A complete design of the 4 bolts is needed to close the items of TSs 3.9.5 and 3.9.6 in terms of the specifications on material, dimensions and locations of the bolts. Completion of the bolt design will yield the necessary specifications in TSs 3.9.5 and 3.9.6 for the hatch bolts which are important to safety, thus are required in the ITAAC pursuant to 10 CFR 52.

2. Applicant References:

DCD Tier 2, Rev. 16, Sections 16.1.1, TR74A, Rev. 1.

3. Context

ITAAC which assure SSCs important to safety would be protected, and not compromised according to GDC-16, Containment Design in the Appendix A to 10CFR50.

Westinghouse Response:

The design requirements and implementation for the AP1000 equipment hatch bolting is consistent with requirements and implementation in operating Westinghouse plants since the requirements for all Westinghouse plants are contained in the Standard Technical Specifications for Westinghouse Plants in NUREG-1431 (Revision 2). Therefore, the number of bolts specified (by simply removing the brackets as indicated in TR 74A, Revision 1) in the AP1000 implementation are the same as operating plants.

There is a correction to the RAI question in that the generic AP1000 Technical Specifications TS 3.9.6 does not contain any requirements for equipment hatch bolting since with renumbering

of the AP1000 Technical Specifications , AP1000 TS 3.9.6 addresses containment air filtration requirements and equipment hatch bolting is not discussed in this TS.

AP1000 TSs 3.6.8 (Containment Penetrations in Modes 5 and 6) and 3.9.5 (Containment Penetrations during refueling operations irradiated fuel movement) identify the requirements for bolting of the containment equipment hatch using four bolts.

The equipment hatch bolting requirement specified in the generic AP1000 Technical Specifications 3.6.8 and 3.9.5 is identically implemented, using four (4) bolts to hold the equipment hatch in place, as it is implemented in the Standard Technical Specifications for various operating Westinghouse plants in Standard Westinghouse Plant Technical Specifications 3.9.4, 3.9.5, and 3.9.6 (although for Standard Westinghouse TSs 3.9.5 and 3.9.6, this same bolting requirement is specified for Actions to mitigate the loss of active shutdown cooling pump OPERABILITY which are not applicable for passive AP1000 design shutdown heat removal).

The Combined License Information in support of these TS items does not include the detailed design characteristics (materials, dimensions, locations, etc.) of the equipment hatch and bolts requested in this RAI, or other lower-level supporting design information and calculations that are being completed as part of the evolving plant design.

This level of information is not appropriate for inclusion in the Technical Specifications and Bases. The required level of detail for Technical Specifications and Bases is established in NUREG-1431, Revision 2, which was the basis for development of the generic AP1000 Technical Specifications for design certification.

The Technical Specification requirement to achieve containment closure with four bolts does not establish the limiting design basis for the containment equipment hatch and the equipment hatch bolts.

During specified shutdown plant conditions, the equipment hatch would be bolted in place to support the Technical Specification requirements, and this would be implemented using the appropriate plant operating procedures, which would be the lower-level document that identifies the bolts locations to be used to fasten the hatch in place in response to either TS 3.6.8 or 3.9.5 requirements. The design basis for the equipment hatch and bolts for these two TSs is established in the Background discussion in the Bases for TS 3.6.8 (with some information duplication in the TS 3.9.6 Bases, including equal bolt spacing):

> *"The design of the equipment hatch is such that the four bolts would only be needed to support the hatch in place and provide adequate strength to support the hatch dead weight and associated loads. The hatch is installed on the inside containment and is held in place against a matching flange surface with mating bolt pattern by the bolts. Once the dead weight is supported, any pressure (greater than atmospheric) within*

containment will serve to exert closure force on the hatch toward the mating flange surface serving to reduce stresses on bolts. Therefore the determination of the number of bolts is limited to the quantity required to support the hatch itself and not related to any potential containment pressure."

TS 3.6.8 and TS 3.9.5 do not establish the equipment hatch bolt design basis since these TSs only require that the equipment hatch bolts be installed as sufficient to support the equipment hatch dead weight to maintain "containment closure" during shutdown conditions.

The limiting design basis requirements for the equipment hatch bolts are based on their capability to establish "containment integrity" as required by TS 3.6.1, which is controlled by the ASME Code requirements for the containment vessel design pressure capability following an accident.

The high-level AP1000 design basis document that implements the Technical Specification requirements is the Containment System (CNS) System Specification Document (SSD), APP-CNS-M3-001.

The detailed design of the equipment hatch bolts are included in the equipment hatch design specification document (APP-MV50-Z0-002) and also in the associated equipment hatch design drawings that are currently being developed, along with the supporting design calculations that form the basis for the equipment hatch design to meet the ASME Code requirements in support of the overall containment vessel design.

For AP1000, the bolt material is specified as Carbon Steel, ASME SA193 Grade B7 with a bolt diameter of 1-5/8 inches (1 5/8 – 8UN), which is being evaluated and confirmed as part of the detailed design.

Since the ASME Code requirements establish the limiting design basis for the containment vessel, as well as ancillary components like the equipment hatch, equipment hatch bolts, the personnel airlocks, and containment penetrations, the design capability of these various components will be confirmed for the plant as part of the containment system ITAAC requirements in DCD Tier 1, Subsection 2.2.1.

As discussed in Item 2.a), "The components identified in Table 2.2.1-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements."

The equipment hatches are specifically included in Table 2.2.1-1 and since the plant equipment drawings include the equipment hatch bolts and other related components as part of the equipment hatch assembly (such as the mating surface, hatch seals, etc.). The existing ITAAC requirements in Subsection 2.2.1 inherently include the equipment hatch bolts.

The confirmation of the equipment hatch and associated equipment hatch component designs are specified under the Acceptance Criteria for Item 2.a) of Table 2.2.1-3, which requires that an ASME Code Section III design reports exist for the as-built components.

Therefore, no new ITAAC requirements are needed for the equipment hatch bolts.

Design Control Document (DCD) Revision:

None

PRA Revision:

None

Technical Report (TR) Revision:

None