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/NRC2323

December 17, 2008

Subject: AP1000 Responses to Requests for Additional Information (SRP16)

Westinghouse is submitting responses to the NRC request for additional information (RAI) on SRP Section 16. These RAI responses are submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in the responses is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification and the AP1000 Design Certification Amendment Application.

Responses are provided for the following RAIs:

RAI-SRP16-CTSB-24
RAI-SRP16-CTSB-51

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

D063
NRO

cc:	D. Jaffe	-	U.S. NRC	1E
	E. McKenna	-	U.S. NRC	1E
	S. K. Mitra	-	U.S. NRC	1E
	P. Ray	-	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
	D. Behnke	-	Westinghouse	1E

ENCLOSURE 1

Responses to Requests for Additional Information on SRP Section 16

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP16-CTSB-24
Revision: 0

Question:

LCO 3.3.2, B 3.3.2; Page 3.3.2-41;

For the description of RCS pressure permissive P-19, provide the basis for the 92% pressurizer water level value as a definition of water solid conditions in lower MODES without automatic isolation of the CVS makeup pumps.

The basis for this value was not evident.

Westinghouse Response:

The basis for including 92% in the discussion for Item 18.e (the P-19 RCS pressure interlock for CVS isolation) in the Bases for TS 3.3.2 clarifies when the plant is in either solid plant or steam bubble conditions.

The important aspect in regard to Item 18.e of TS 3.3.2 is that with RCS pressure above the P-19 setpoint, certain protective features associated with an approach to solid plant operations can be blocked in order to fill the pressurizer and establish water solid operations and that these features automatically unblock.

The parenthetical comment indicates when the plant is water solid or not and is unrelated to initiation of the P-19 interlock.

The use of 92% pressurizer level for this note is consistent with the use of the 92% pressurizer level as being water solid or not in the notes for LCOs 3.4.4, 3.4.5, 3.4.8, and 3.4.14. The basis is to provide an adequate steam bubble in the pressurizer for the identified plant operation, as discussed in the Bases for each of these LCOs.

The basis for this specific pressurizer water level is that the indicated pressurizer level is below the 100% indicated level span reading such that instrumentation errors / uncertainty are appropriately accounted and that a steam bubble does exist when the pressurizer level indicates 92% level or less.

Design Control Document (DCD) Revision:

None

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

PRA Revision:

None

Technical Report (TR) Revision:

None

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP16-CTSB-51
Revision: 0

Question:

TS 3.3.2 Engineering Safety Features Actuation System

Justify the application of Note 8, DCD Table 7.3-1, "Engineered Safety Features actuation Signals," to signals 3.c, 16.b, and 22.a. Resolve the discrepancy between the application of Note 8 to signal 16.b and the TS Basis for TS signal 20.b.

Note 8 of Table 7.3-1 identifies that the signal associated with these functions does not meet the 10 CFR 50.36(c)(2)(ii) criteria and is not included in the Technical Specifications. The actuation signal to which Note 8 was applied is undervoltage to the Class 1E battery chargers for selected engineered safety features (ESF) functions. The respective ESF functions are: initiation of the automatic depressurization system; main control room isolation and air supply initiation; and opening of containment recirculation valves in series with check valves. The basis for exclusion of these actuation signals was not evident from the DCD.

In addition, the TS Bases 3.3.2 and Table 3.3.2-1 identifies that low battery charger input voltage is a required TS variable (20.b) for main control room isolation and air supply initiation; this is contrary to Note 8 of Table 7.3-1.

Westinghouse Response:

These various actuation functions are from the battery charger undervoltage voltage, which is a long-term, post-accident condition related to the plant electrical power status and not related to any specific conditions assumed in plant safety analyses for accident mitigation, as discussed for each actuation signal below.

Note 8 is correct in that these signals are not captured by the Technical Specification screening criteria and are <u>not</u> required to be included in Technical Specifications (in TS 3.3.2, Table 3.3.2-1, ESF Actuation Instrumentation).

One minor correction to the question above is that Note 8 of Table 7.3-1 applies to Item 3.b (battery undervoltage) and not 3.c (manual actuation).

<u>Table 7.3-1, Item 3.c (Actuation of Stage 1-3 Automatic Depressurization System [ADS] Valves)</u>

Actuation of motor-operated ADS Stages 1 to 3 is initiated on low battery charger voltage following an extended loss of ac power (after approximately 22 hours) and, therefore, this actuation is not assumed or credited in safety analysis.

In this situation, the plant would have been maintained in a stable safe shutdown condition and the need for ADS Stage 1 to 3 actuation protects the ADS actuation function, unrelated to any specific post-shutdown conditions assumed in safety analyses.

The ADS valves are actuated prior to the Class 1E batteries being depleted so that they can be capable of actuating (opening) these motor-operated ADS valves before the batteries are exhausted.

The actuation of the ADS Stage 1 to 3 valves in this situation is discussed in the eleventh paragraph of DCD Section 7.4.1.1.

Safety analyses do not credit this specific actuation signal since the plant would have been in a long-term safe shutdown condition prior to the need for this low voltage ADS actuation signal.

Table 7.3-1, Item 16.c (Actuation of Main Control Room [MCR] Isolation / Air Supply Actuation)

As discussed in DCD Section 6.4.3.2, isolation of the MCR and actuation of the MCR Emergency Habitability System (VES) is initiated on low battery charger voltage following an extended loss of ac power (after approximately 10 minutes).

The battery charger undervoltage signal provides a VES actuation that secures the MCR envelope boundary and provides passive air pressurization without electrical power. These actions do not have onerous plant consequences and can be restored once electrical power and normal HVAC are available.

For this actuation signal, no specific accident condition exists that would challenge MCR habitability so Note 8 applies for this item.

For accidents that challenge MCR habitability, the two automatic actuation signals provided in DCD Table 3.3.2-1 (Item 20) provide plant protection assumed in safety analyses for a MCR supply duct high radiation signal and for a pressurizer low pressure actuation signal.

Table 7.3-1, Item 22.a (Actuation of [Containment] Recirculation Valves)

This signal is used to actuate the containment recirculation squib valves (that are in the two lines in series with check valves). This is similar to the discussion for the Stage 1 to 3 ADS valves for Item 3.c above. This signal is associated with an extended loss of ac power (approximately 22 hours), where the plant is in a safe shutdown condition. The actuation is prior to exhausting the Class 1E batteries, as discussed for Item 3.c.

The same cumulative loss of power timer that is used for the ADS valves in Item 3.c is used to initiate this actuation signal as shown in DCD Figure 7.2-1, Sheets 15 and 16.

This actuation signal is not assumed or credited in safety analyses (see Item 3.c).

Table 3.3.2-1, Item 20.b Inconsistency

The inconsistency related to VES actuation of MCR pressurization between Item 16.b in Table 7.3-1 and Item 20.b in TS Table 3.3.2-1 (and its Bases) was identified in DCD Revision 16.

TS Table 3.3.2-1, Item 20.b and the Bases discussion were corrected in DCD Revision 17 to eliminate the battery charger input voltage (low) signal from Table 3.3.2-1 and its associated Bases discussion and the items were renumbered. The previous Item 20.c became 20.b in Revision 17.

Design Control Document (DCD) Revision:

None

PRA Revision:

None

Technical Report (TR) Revision:

None