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Your ref: Docket No. 52-006
Our ref: DCP_NRC_002814

March 8, 2010

Subject: AP1000 Response to Proposed Open Item (Chapter 7)

Westinghouse is submitting the following responses to the NRC open item (OI) on Chapter 3. These proposed open item responses 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-SRP7.2-ICE-09

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,

A handwritten signature in black ink, appearing to read 'Robert Sisk'.

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

/Enclosure

1. Response to Proposed Open Item (Chapter 7)

cc:	D. Jaffe	- U.S. NRC	1E
	E. McKenna	- U.S. NRC	1E
	S. Mitra	- 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
	B. Seelman	- Westinghouse	1E

ENCLOSURE 1

AP1000 Response to Proposed Open Item (Chapter 7)

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Response to Open Item (OI)

RAI Response Number: OI-SRP7.2-ICE-09

Revision: 0

Question:

7.2.7 Protection Systems Setpoint Methodology

On May 30, 2006, WEC submitted WCAP-16361-P (APP-PMS-JEP-001), "Westinghouse Setpoint Methodology for Protection Systems—AP1000," Revision 0 (ADAMS Accession No. ML061530485). The following regulatory requirements and guidance documents apply to the staff's review of WCAP-16361-P:

- GDC 13 and 20
- 10 CFR 50.36(c)(ii)(A) (requires that the technical specifications include limiting safety-system settings)
- Regulatory Guide 1.105, "Setpoint for Safety-Related Instrumentation" (describes a method acceptable to the NRC staff for complying with the NRC's regulations for ensuring that setpoints for safety-related instrumentation are initially within, and remain within, the safety limit)

The WEC setpoint methodology combines the AP1000 uncertainty components to determine the overall channel statistical allowance for the functions of the RTS/ESFAS. All appropriate and applicable uncertainties, as defined by a review of the AP1000 baseline design input documentation, have been considered for each RTS/ESFAS function. The methodology used to combine the uncertainty components for a channel is an appropriate combination of those groups that are statistically and functionally independent. Those uncertainties that are not independent are conservatively treated by arithmetic summation and then systematically combined with the independent terms. It includes instrument (sensor and process rack) uncertainties and noninstrument-related effects (process measurement accuracy). The methodology used the square root-of-the-sum-of-the-squares technique, which the NRC has approved. Also, the American National Standards Institute, the American Nuclear Society, and the Instrument Society of America approve the use of the same probabilistic and statistical techniques for the various standards that determine safety-related setpoints.

The staff reviewed WCAP-16361-P and found that the allowable values (AVs) are equal to the rack calibration accuracy, which is the acceptable "as-left" value. This methodology ensures that the purpose of the AV is satisfied by providing a large enough allowance to account for those uncertainties not measured during the surveillance tests to protect the safety limit. Also, the difference between the AV and the nominal trip setpoint is as large as the calibration tolerance, and the AVs, along with the nominal trip setpoint, are included in the plant technical specifications as the associated criteria, in accordance with 10 CFR 50.36. Therefore, the staff concludes that the proposed WCAP-16361-P is acceptable.

Section 7.1.6.1 of Revision 17 of the AP1000 DCD states that all requested information on the subject of setpoint methodology and final setpoint calculations has been completely addressed and requires no further action by the COL applicant. This statement is not in agreement with

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WCAP-16361-P, in which WEC concludes that it cannot determine the final setpoint calculations until it completes the final design of the power plant. The staff issued RAI-SRP7.2-ICE-08, requesting that WEC demonstrate how it intends to meet the final calculation requirements, given that it has not completed the protection system design. WEC submitted DCR/NRC2315 (ADAMS Accession No. ML083470287) to the NRC on December 9, 2008, declaring that the COL applicant will determine the setpoint adequacy, in accordance with AP1000 DCD Tier 1, Table 2.5.2-8, Item 10. However, as of this date, WEC has not provided the document to verify COL applicant setpoint calculations are consistent with SCAP-16361 discussed in its December 9, 2008, response. Furthermore, the current language in AP1000 Tier 2, Chapter 7, Section 7.1.6.1, where WEC claims that the submittal and approval of the WCAP-16361-P report completely addresses all requested COL information, does not fulfill the commitment in the response letter. Therefore, WEC must restore the language in Section 7.1.6.1, stating that the COL applicant or licensee will be responsible for the final determination of setpoints, in accordance with AP1000 DCD Tier 1, Chapter 2, Section 2.5.2, ITAAC Table 2.5.2-8, Design Commitment 10. **The NRC staff identified this as OI-7.2-09.**

IEEE Std. 603-1991, Clause 6.8: The staff found the proposed setpoint methodology acceptable. However, Section 7.1.6.1 of the AP1000 DCD states that WEC has also completed the final setpoint calculations. The staff has not received adequate information demonstrating that WEC has completed the final setpoint calculations. Section 7.2.7 of this report discusses the issue. **The NRC staff identified this as OI-SRP-7.2-09.**

Westinghouse Response:

WCAP-16361-P, Westinghouse Setpoint Methodology for Protection Systems – AP1000, provides preliminary instrument uncertainty calculations for the Reactor Trip System (RTS) and Engineered Safeguards Features Actuation System (ESFAS) functions for the AP1000 plant. Reconciliation of the final setpoint study for each plant cannot be performed until the design for that plant is finalized.

Recently, under the umbrella of RAI--SRP16.3-CTSB-SCP-1 submitted via DCP_NRC_002784 dated February 19th 2010, Westinghouse created a Setpoint Control Program (SCP) that will be incorporated into the AP1000 DCD technical specifications (TS) in accordance with COL/DC-ISG-8, "Technical Specification Information that Combined License Applicants Must Provide in Combined License Application," that specifies use of an NRC-approved methodology for determining instrumentation trip setpoints (i.e., WCAP-16361, APP-PMS-JEP-001, Revision 0, May 2006, "Westinghouse Setpoint Methodology for Protection Systems – AP1000"). This will facilitate combined license (COL) applicants' adoption of the AP1000 DCD TS. The Reference COL plant intends to incorporate an SCP into its plant-specific TS. Prior to initial fuel load, a reconciliation of the setpoints against the final design for each plant will be performed.

References:

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1. WCAP-16361-P, APP-PMS-JEP-001, Revision 0, May 2006, "Westinghouse Setpoint Methodology for Protection Systems – AP1000

Design Control Document (DCD) Revision:

7.1.6.1 The Combined License information requested in this subsection is ~~has been completely~~ addressed in WCAP-16361-P (Reference 17), and the applicable changes are incorporated into the DCD. The Westinghouse Setpoint Control Program (SCP) will be incorporated into the AP1000 DCD technical specifications (TS) in accordance with COL/DC-ISG-8. This will facilitate combined license (COL) applicants' adoption of the AP1000 DCD TS. Prior to initial fuel load, a reconciliation of the setpoints against the final design for each plant will be performed. ~~No additional work is required by the Combined License applicant.~~

The following words represent the original Combined License Information Item commitment, which has been addressed as discussed above:

Combined License applicants referencing the AP1000 certified design will provide a calculation of setpoints for protective functions consistent with the methodology presented in Reference 5. Reference 5 is an AP600 document that describes a methodology that is applicable to AP1000. AP1000 has some slight differences in instrument spans.

Modify Tier 2, Table 1.8-2, "Summary of AP1000 Standard Plant Combined License Information Items," as follows:

Table 1.8-2					
SUMMARY OF AP1000 STANDARD PLANT COMBINED LICENSE INFORMATION ITEMS					
Item No.	Subject	Subsection	Addressed by Westinghouse Document	Action Required by COL Applicant	Action Required by COL Holder
6.6-1	Inspection Programs	6.6.9.1	N/A	Yes	—
6.6-2	Construction Activities	6.6.9.2	N/A	Yes	—
7.1-1	Setpoint Calculations for Protective	7.1.6.1	WCAP-16361-P	No Yes	No Yes

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	Functions				
7.1-2	Resolution of Generic Open Items and Plant-Specific Action Items	7.1.6.2	APP-GW-GLR-017	No	No
7.2-1	FMEA for Protection System	7.2.3	WCAP-16438-P WCAP-16592-P	No	No

PRA Revision:

None

Technical Report (TR) Revision:

None