AP1000DCDFileNPEm Resource

From: Adams II, Samuel L. [adamssl@westinghouse.com]
Sent: Tuesday, May 06, 2008 3:52 PM
To: Perry Buckberg
Cc: Rhonda Carmon
Subject: FW: RAIs for 10.2 - Corrected
Attachments: SBPA Chapter 10.2 RAIs .DOC

Hi Perry,

I acknowledge receipt of the corrected RAIs on SRP 10.2.

I will let you know as soon as possible if a clarification call is necessary.

Thanks

Sam

From: Perry Buckberg [mailto:Perry.Buckberg@nrc.gov]
Sent: Tuesday, May 06, 2008 1:55 PM
To: Adams II, Samuel L.
Cc: Rhonda Carmon; Eileen McKenna; David Jaffe
Subject: RAIs for 10.2 - Corrected

Sam,

Attached are DCD RAIs for SRP section 10.2. I correctly numbered the third on this attachment as RAI-SRP 10.2-SBPA-03 (it was …-01 when I sent it on 5/2). Please acknowledge receipt of the attached and let me know ASAP if a phone conference will be needed.

Thanks,

Perry Buckberg
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Office of New Reactors
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Hearing Identifier: AP1000_DCD_Review
Email Number: 7

Mail Envelope Properties (9950B72C4C6D8D43958795C414DE477A05F21711)

Subject: FW: RAIs for 10.2 - Corrected
Sent Date: 5/6/2008 3:51:40 PM
Received Date: 5/6/2008 3:51:43 PM
From: Adams II, Samuel L.

Created By: adamssl@westinghouse.com

Recipients:
"Rhonda Carmon" <Rhonda.Carmon@nrc.gov>
Tracking Status: None
"Perry Buckberg" <Perry.Buckberg@nrc.gov>
Tracking Status: None

Post Office: SWEC9910.w-intra.net

Files	**Size**	**Date & Time**
MESSAGE	885	5/6/2008 3:51:43 PM
SBPA Chapter 10.2 RAIs .DOC	51776	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

RAI-SRP 10.2-SBPA-01

Section 3.0,"Technical Background," Page 5 of TR-86, Revision 1, states, "Both the electrical overspeed trip system and the emergency overspeed trip systems in the master controller meet the-single failure criterion and are testable when the turbine is in operation." Also, Standard Review Plan (SRP) 10.2, Section II, "SRP Acceptance Criteria," Item 1.A, states, "A turbine control and overspeed protection system would control turbine action under all normal and abnormal operating conditions and should ensure that a full-load turbine trip will not cause the turbine to overspeed beyond acceptable limits…..The overspeed protection system should meet single failure criterion and should be testable when the turbine is in operation." However, the NRC staff's review of the AP1000 DCD, Revision 16, could not find any commitment for either the electrical overspeed trip system or the emergency overspeed trip system in the master controller in meeting the single failure criterion. Therefore, in order to meet this SRP guidance, the staff requests the applicant to provide additional information and justification in meeting the SRP guidance on single-failure criteria for the above testing,

RAI-SRP 10.2-SBPA-02

With respect to the diversity of AP1000 DCD turbine overspeed control system, in its earlier request for additional information (RAI-TR86-SBPB-01, Item 3), the NRC staff requested the applicant to provide further information for a comparison of the reliability of the proposed turbine overspeed protection capability to the reliability that is afforded by the diverse capability that exists for existing plants. In its response, in a letter dated July 27, 2007, Westinghose stated, "Another degree of diversity is provided by the software based trip that takes the speed reading from the I/O modules and applies control builder logic to determine the trip function which is then output via separate relay modules." Westinghouse response was not specific enough whether this applies to the primary overspeed trip of 110 percent and/or the emergency backup overspeed trip of 111 percent. Further, nothing else was stated in the DCD markup (TR-86) or in the rest of the above RAI response that would provide further details of the software configuration for the overspeed trip system. The NRC staff's concern is that if both the 110 percent and 111 percent overspeed trips use the same software, then a common cause failure (CCF) could render both systems inoperable. Therefore, with respect to defense against CCF for design diversity, and also to meet the guidance provided in SRP 10.2, Part III, "REVIEW PROCEDURES," Subsection 2.A where it states, "The design of the in-depth defense provided by the turbine generator protection system to preclude excessive overspeeds should include diverse protection means," the staff requests additional information and justification relating to the diversity of the turbine overspeed control system for AP1000 DCD, since it replaces the current mechanical overspeed system.

RAI-SRP 10.2-SBPA-03

In SRP Section 10.2.III, "Review Procedures," the guidance in Item 2B states, "For normal speed-load control, the speed governor of the electrohydraulic control system fully cuts off steam at approximately 103 percent of rated turbine speed by closing the control and intercept valves." The original design contained this provision as shown in Table 10.2-2 of AP1000 DCD, Revision 15. However, for the new design, the applicant eliminated the 103 percent trip without providing any reason in DCD Revision 16 or TR-86, Revision 1. Therefore, the staff requests the applicant to provide justification for this elimination of 103 percent trip feature.

RAI-SRP 10.2-SBPA-04

With respect to failure modes and effects analysis (FMEA) for the proposed turbine overspeed protection equipment of AP1000 DCD turbines, in its earlier RAI-TR86-SBPB-01, Item 4, the NRC staff requested the applicant to provide a FMEA analysis, specifically to identify common cause failure vulnerabilities. In its response, in a letter dated July 27, 2007, Westinghose stated that the detailed design of the emergency overspeed trip system is being completed for the AP1000. Also, the applicant stated that upon completion of the system design, a FMEA will be performed to identify and address potential common mode failures. Diversity will be provided to the extent possible through the design of the system. However, the staff could not complete its review of this area until the applicant submits its response in this regard. Therefore, the staff requests the applicant to provide a time-frame for completion of the system design and submittal of the FMA analysis, specifically, common mode failures of the software for the 110 and 111 percent overspeed protection features**.**