AP1000DCDFileNPEm Resource

From: Adams II, Samuel L. [adamssl@westinghouse.com]
Sent: Wednesday, July 09, 2008 9:49 AM
To: Perry Buckberg
Cc: Rhonda Carmon
Subject: FW: RAIs SRP 9.1.5
Attachments: RAI SRP 9.1.5 SBPB 09 to 11.doc

Hi Perry,

I acknowledge receipt of the attached RAIs on SRP Section 9.1.5.

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, July 08, 2008 1:11 PM
To: Adams II, Samuel L.
Cc: Eileen McKenna; Rhonda Carmon; David Jaffe
Subject: RAIs SRP 9.1.5

Sam,

Attached are three RAIs, RAI SRP 9.1.5-SBPB-09 to 1. 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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Subject: FW: RAIs SRP 9.1.5
Sent Date: 7/9/2008 9:49:06 AM
Received Date: 7/9/2008 9:49:09 AM
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

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MESSAGE	774	7/9/2008 9:49:09 AM
RAI SRP 9.1.5 SBPB 09 to 11.doc	38464	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
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Section 9.1.5.1.2 "Codes and Standards" of the AP1000 DCD Revision 16 states that, "the polar crane and the cask handling crane are designed according to NUREG-0554 supplemented by ASME NOG-1 for a Type 1 single failure proof crane." Section 9.1.5.2 "System Description," of the AP1000 DCD Revision 16 states that, "the containment equipment hatch hoist and the containment maintenance hatch hoist incorporate single failure proof features based on NUREG-0612 guidelines." The AP1000 DCD/ Tier 1 Section 2.3.5 does not list "single failure proof" as certified design information with ITAAC for either the polar crane, the cask handling crane, the containment equipment hatch hoist or the containment maintenance hatch hoist. The staff believes that "single failure proof" design criteria for the above listed cranes and hoists should be listed in Tier 1 as described below.

One design criteria, among several design criteria for Tier 1 information, is that it should include features and functions which could have a significant effect on the safety of a nuclear plant or are important in preventing or mitigating severe accidents. A drop of the reactor vessel head or a spent fuel cask could affect plant safety. Therefore, design features that reduce the risk and/or analyses that provide assurance of safety after a dropped load are important to safety. The staff considers "single failure proof" design criteria for the polar crane and the cask handling crane as Tier 1 safety significant design criteria. As a minimum, the following analyses would have to be performed in order to not consider "single failure proof" design criteria as safety significant criteria for the polar crane and the cask handling crane:

- A heavy load analysis proving that a heavy load drop in safety related areas of the plant will not be the cause any of Items I through IV of section 5.1 of NUREG 0612, "Control of Heavy Loads at Nuclear Power Plants." [Section 9.1.5.3 of the AP1000 DCD clearly states that no heavy load analyses were performed for critical loads carried by the containment polar crane, the cask handling crane, the containment equipment hatch hoist and the containment maintenance hatch hoist.]

- SRP 9.1.5, "Overhead Heavy Load Handling Systems," Section III. 4, states that without "single failure proof" design criteria, analyses are required for a dropped load on the reactor vessel, among other analyses. The DCD does not describe results of this analysis.

- Regulatory Guide 1.13, Regulatory Position C.5 states that an alternative to an "single failure proof" crane is that the spent fuel cask loading area be designed to withstand a drop of the heaviest load at the maximum height. Whereas, AP1000 DCD Section 15.7.5 states a Spent Fuel Cask Drop Accident Analysis was not performed.

As a minimum, the following analysis would have to be performed in order to not consider "single failure proof" design criteria as safety significant criteria for the containment equipment hatch hoist and the containment maintenance hatch hoist:

- A heavy load analysis proving that a heavy load drop in safety related areas of the plant will not be the cause any of Items I through IV of section 5.1 of NUREG 0612, "Control of Heavy Loads at Nuclear Power Plants." [Section 9.1.5.3 of

the AP1000 DCD clearly states that no heavy load analyses were performed for critical loads carried by the containment polar crane, the cask handling crane, the containment equipment hatch hoist and the containment maintenance hatch hoist.]

Without the analyses and design criteria stated above, the "single failure proof" design feature of the polar crane, cask handling crane, containment maintenance hatch crane and containment equipment hatch crane becomes safety significant design criteria.

The staff notes that the applicant prevents the cask handling crane from moving over the spent fuel pool because the crane rails do not extend over the pool. Mechanical stops prevent the cask handling crane from going beyond the end of the rails. However, Regulatory Guide 1.13, Regulatory Position C.5 specifies that the spent fuel cask loading area be designed to withstand, without significant leakage of the adjacent spent fuel storage, the impact of the heaviest load to be carried by the crane from the maximum height to which it can be lifted or the spent fuel storage facility should have cranes designed to single failure proof criteria. Since the DCD did not declare that the spent fuel cask loading area is designed to withstand the impact of the heaviest load to be carried from the maximum height to which it can be lifted, without significant leakage of the adjacent spent fuel storage, the single failure proof design criteria for the cask handling crane is safety significant design criteria.

RAI SRP 9.1.5-SBPB-09

Please justify why the applicant did not include "single failure proof" design criteria and ITAAC in Tier 1 of the DCD, which are safety significant design criteria, for the polar crane, the cask handling crane, the containment equipment hatch hoist and the containment maintenance hatch hoist .

RAI SRP 9.1.5-SBPB-10

Section 9.1.5.3, "Safety Evaluation" of the AP1000 DCD in the first bulleted item, states that "Postulated load drops are evaluated in the heavy load analysis." The last sentence of that section states, "The heavy load analysis is to confirm that a postulated load drop analysis does not cause unacceptable damage to reactor fuel elements, or loss of safe shutdown or decay heat removal capability." Please describe what heavy load drop analyses were performed and the results of the analyses.

RAI SRP 9.1.5-SBPB-11

SRP Section I.4.C. states that ASME NOG-1 criteria for Type 1 cranes is an acceptable method for compliance with the NUREG-0554 guidelines. ASME NOG -1 provides detailed design specifications for "single failure proof" cranes and hoists. NUREG-0554, while not being a design specification, provides more general design guidelines for "single failure proof" features. Please explain your choice to not specify ASME NOG-1 for Type 1 hoists for the containment equipment hatch hoist and the containment maintenance hatch hoist.