AP1000DCDFileNPEm Resource

From: Buckberg, Perry
Sent: Tuesday, February 16, 2010 12:59 PM
To: DeBlasio, John J.
Cc: 'Loza, Paul G.'; Wiseman, Dale A.; McKenna, Eileen; Jaffe, David
Subject: OI-SRP 5.4.1-CIB1-01 follow up questions (AP1000 RCP flywheel analysis)
Attachments: OI-SRP 5.4.1-CIB1-01 follow-up questions.doc

John,

During a 1/25/10 phone conference, we discussed the subject 5.4.1 OI (RCP flywheel analysis) and the recent Westinghouse responses to the three SRP 5.2.3 RAIs. I have attached OI-SRP 5.4.1-CIB1-01 follow-up questions to this e-mail. Please let me know when you want to discuss resolution of this OI.

During the 1/28/10 ACRS meeting, I handed you an advance copy of the attached OI follow-up questions. This e-mail is primarily for tracking purposes.

Thanks,

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Hearing Identifier: AP1000_DCD_Review
Email Number: 297

Mail Envelope Properties (Perry.Buckberg@nrc.gov20100216125800)

Subject: OI-SRP 5.4.1-CIB1-01 follow up questions (AP1000 RCP flywheel analysis)
Sent Date: 2/16/2010 12:58:48 PM
Received Date: 2/16/2010 12:58:00 PM
From: Buckberg, Perry

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Files	**Size**	**Date & Time**
MESSAGE	671	2/16/2010 12:58:00 PM
OI-SRP 5.4.1-CIB1-01 follow-up questions.doc	33274	

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

OI-SRP 5.4.1-CIB1-01 conference call (1/25/10) follow-up questions

The following questions are the result of reviewing the RCP flywheel analysis (Curtis Wright report - Rev 2.) with input from the 12/31/09 response to RAI-SRP 5.2.3-CIB1-01 (questions 1 through 5 which dealt with Rev 17 changes to RCP pressure boundary material that would affect the RCP flywheel analysis).

1. Curtis Wright Report AP1000RCP-06-009-P, Revision 2, dated July 16, 2009, incorporated changes to the outer retainer cylinder from 18Ni Maraging steel to 18Cr-18Mn Alloy steel. This report analyzed the potential of the flywheel penetrating the reactor coolant pump casing. Based on it's review, the NRC staff has the following requests for additional information:

    a. Section 1.0 states that the reactor coolant pressure boundary (stator shell, flange, and casing) is analyzed to demonstrate that a fractured flywheel cannot breach the reactor coolant pump pressure boundary. In addition, Section 3.0 states that surrounding the larger flywheel assembly are the heavy walls of the casing, thermal barrier, and stator closure, and surrounding the smaller flywheel assembly is the heavy wall of the stator lower flange. However Figure 3-1 shows an additional component, stator closure ring, surrounding the larger flywheel assembly, and the thermal barrier, stator closure and stator closure ring are bolted together. Section 5.2.1 states that the shell containment in line with the flywheel heavy metal segments was the only containment material considered. Section 5.2.2 states that the upper flywheel is conservatively assumed to be through the thermal barrier and the adjacent stator closure.
        i. Discuss whether the new component on the pump, the stator closure ring, was included in the analysis. In addition, provide the results of the analysis.
        ii. It should be noted that Section 5.2.3 of the report only states that a flywheel fracture would not penetrate the thermal barrier and stator closure that surround the upper flywheel assembly. However, Westinghouse letter dated December 31, 2009, stated that the casing, thermal barrier and stator closure ring were considered in the analysis, but not the stator closure. Clarify the discrepancy between these statements.
        iii. Discuss the material and the number of bolts used in the thermal barrier, stator closure and stator closure ring.
        iv. Discuss how the thermal barrier, stator closure and stator closure ring can be assumed to be one component since a ruptured flywheel could shear the bolts, and discuss the analysis for this shear mechanism.

v. Provide the most up to date Figure 3-1. Please discuss how any changes made to this figure will effect the flywheel analysis.

b. Discuss how the critical flaw size of the outer retainer cylinder in Sections 2.0 and 5.1 was determined based on the design life used in the evaluation.
c. Discuss why the dimensions for the upper and lower flywheel assembly in Sections 5.1.1 and Figure 5-1 were changed. Also, include in the report that this analysis applies only to a flywheel with the same dimensions and materials.

   Note:
   Changes to the flywheel dimensions or materials, and other changes that would affect the missile penetration analysis (such as surrounding containment thickness) in this report require that the analysis be reevaluated and submitted to the NRC.

d. Discuss why Section 5.1.4 did not include stress concentration effects of the gap between the heavy metal inserts, similar to Section 5.1.6, in determining the hoop stresses.