April 11, 2006

Memorandum To: ALLEGATION FILE RIV-2006-A-0011

From: Claude E. Johnson, Chief
Project Branch A
Division Reactor Projects

SUBJECT: CLOSURE OF ASSIGNED CONCERNS FOR ALLEGATION RIV-2006-A-0011

This memorandum provides the background closure information for Allegation RIV-2006-A-0011. The two concerns were inspected by RPBA.

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Inspector Followup to Allegation RIV-2006-A-0011

Background: On June 14, 2005, the Columbia Generating Station Service Water Pump A failed due to Intergranular Stress Corrosion Cracking (IGSCC) of the vertical pump shafts at the couplings. The pump was repaired and declared operable. Concerns were raised about the condition of the B service water pump because of its similar design and operating conditions. The B pump was not disassembled to be inspected or repaired due to parts issues and the plant was started up and operated with questions surrounding the ability of this pump to perform its safety function for its mission time. The plant startup following the failure of the A service water pump and the delay in establishing the actual condition of the B service water pump resulted in the concerns listed below.

The following concerns were inspected by the Resident Inspectors at Columbia Generating Station and the Senior Project Engineer in Region IV. Available information from other related allegation concerns were used to address Concern 1.

Concern 1 -

CGS Management is in a flurry of "damage control" actions they hope will mitigate the situation that has developed (i.e. the station service water pump B issue).

Conclusion -

The inspector did not substantiate the concern.

The inspector reviewed responses to allegations that were referred to them dating back to October 25, 2005 along with the results of allegation concerns that were inspected by the NRC to determine if the actions taken by licensee management constituted "damage control." The inspector noted that many of the allegation concerns were associated with a perception that management was not taking the recommendations of the staff into appropriate consideration during their decision making process. The inspector considered this perception to be due primarily to a lack of effective communication between the staff and management as to the reasons that certain actions were being taken. During this review, no evidence of intentional wrong doing in this regard was identified. Columbia Generating Station management did take many actions in response to this condition, as would be expected in such a case. However, none of these actions constituted a deliberate attempt to deceive or otherwise inappropriately deal with this situation. As a result, this concern was not substantiated.

Concern 2 -

A 24 hour operating time does not seem sufficient in this case, considering the lack of viable options for residual heat removal, and the overall impact on the plant.

Conclusion -

The inspector did not substantiate the concern.

The inspector reviewed several plant operating procedures and noted the following regarding alternate decay heat removal capabilities without SW-P-1A and SW-P-1B, post 24 hr run time:

1. Post scram, the plant would be in shutdown cooling mode and in mode 4 within 24 hrs, unless the plant was staying in mode 3 post scram.

   - Upon a loss of shutdown cooling, operators would implement ABN-RHR-SDC-LOSS procedure which in general provides direction to "feed and bleed" to cool the core. Without either train of RHR available the procedure would direct operators to feed using the CRD pumps and to let down using the RWCU system.

   - If continued cooling is desired and RHR can not be recovered then the operator would enter ABN-RHR-SDC-ALT which provides for alternate means of cooling the core. It would direct with no LPCI or LPCS available to feed using HPCS, CRD, or condensate. Inventory would then be steamed off to the main condenser or alternatively to the suppression pool via the SRV's (steaming to the SRV's would require RHR pump support for supp pool cooling though).

2. Both RHR pumps A and B have seal coolers that are supplied from SSW. Therefore in a loss of both SSW pumps no seal cooling would be available to either RHR pump A or B. However, a loss of seal cooling is a long term degrdation issue of the pump seal during shutdown cooling. Additionally, it is expected that the pumps would continue to operate for a substantial period of time without seal cooling in the shutdown cooling mode or in LPCI mode. Additionally, RHR pump C and the LPCS pumps do not have seal coolers and basically provide the same function for core injection as RHR pumps A and B (LPCS has a thrust bearing which is cooled by SSW). Therefore a loss of SSW should not result in a loss of LPCI but could result in a loss of LPCS function.

3. SSW supplies cooling to the ECCS pump rooms (except HPCS room). A loss of SSW would result in increased room temperatures which would result in the environmental qualifications not being met which would most likely be a long term degradation issue for the pump motors and could result in eventual failure of the motors.

4. Post accident, ops would be in EOP 5.1.1, for level control. This provides for alternate injection methods from HPCS, condensate, fire water, ECCS water leg pumps, and SLC if LPCS and LPCI are not available. If drywell and wetwell temps can not be maintained due to a loss of SSW and therefore RHR pumps A and B, then EOPs direct emergency depressurizing the vessel which essentially directs depressurizing using the SRVs (or alternate methods as directed) until cold shutdown conditions (with shutdown cooling unavailable).

Based on these procedures, the inspector determined that a 24 hour run time of SW-P-1B was sufficient to demonstrate availability of the pump to perform its required safety function.

PRA Perspective

A review of normal operating and off-normal plant procedures as well as severe accident management guidelines indicated that the licensee had many options available to cope with a loss of both standby service water pumps after they had operated successfully for 24 hours in response to an initiating event. Given the alternate cooling strategies and lowered decay heat load in combination with the augmented managerial and operational staffing expected to be on site by this time, it is unlikely that standby service water pump failures beyond 24 hours post-accident would add appreciably to the core damage or large early release risk.