Memorandum To: ALLEGATION FILE RIV-2005-A-0130

From: Thomas R. Farnholtz, Acting Chief
Project Branch A
Division Reactor Projects

SUBJECT: CLOSURE OF ASSIGNED CONCERNS FOR ALLEGATION RIV-2005-A-0130

This memorandum provides the background closure information for Allegation RIV-2005-A-0130. On December 20, 2005, Energy Northwest responded to twelve concerns identified in the allegation. In reviewing Energy Northwest's response, the NRC considered whether: (1) the licensee's response adequately addressed the individual concerns; and (2) the allegers concerns were substantiated.

Inspector Followup to Allegation RIV-2005-A-0130

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 licensee's response to the following allegation concerns are based upon investigation conducted by the Nuclear Safety Issues Program (NSIP) Manager who is independent of the Plant Operations organization. In addition, the licensee performed four independent analysis of the issues of concern in the NRC allegations. These included:

1. An evaluation of a concern in the Nuclear Safety Issues Program,

2. An assessment by the Columbia Corporate Nuclear Safety Review Board (CNSRB),

3. A detailed evaluation of the root cause of the SW-P-1A failure, including proposed corrective actions, and

4. An operability procedure compliance review concerning the determination fo SW-P-1B operability.

The inspector considered these activities to be sufficiently independent of the organizations in question.

With regards to enforcement actions to be taken by the NRC, an Unresolved Item (URI) was issued in inspection report 05000397/2005003 to capture the issue of the failure to adequately address industry operating experience regarding service water pumps. This issue was unresolved pending the inspection of the B pump. We expect to conclude our inspection activities and significance determination and document the results by the end of the first quarter, 2006.

Concern 1 -

Energy Northwest has been told in no uncertain terms that SW-P-1B is expected to have the same catastrophic failure mechanism that occurred with SW-P-1A (intergranular stress corrosion cracking). Yet management seems to ignore the serious risk should an accident occur.

Conclusion -

The inspector did not substantiate the concern due to a lack of evidence that management was ignoring this issue.

The licensee conducted interviews with eight engineers, one supervisor, the Maintenance Manager, the previous and current Engineering Manager, and the Root Cause Analyst to determine the number of individuals involved in this concern. To address the continued operability of SW-P-1B, the licensee determined that the ultimate decision was reached in accordance with, and by the persons charged with making these decisions in accordance with applicable processes and procedures and was considered valid by the independent reviewer. It was also considered appropriate based on another independent review by the Corporate Nuclear Review Board.

The inspector determined that there was no evidence that management either deliberately or inadvertently ignored the issue of SW-P-1B operability.

Concern 2 -

It is impossible to show SW-P-1B to be operable in the sense of assurance that it could meet its safety function. It barely meets its Tech Spec surveillance test requirements, but this testing cannot anticipate the approach to failure.

Conclusion -

The inspector did not substantiate this concern. The operability of service water pump B was demonstrated by successfully meeting all Technical Specification requirements. No evidence was presented that indicated that the pump was not able to perform its safety function. It is true that the testing conducted on this pump could most likely not anticipate the approach to failure but all available test data available indicated that the pump was capable of performing it required safety function.

The licensee clearly stated in their response that should exactly similar conditions as was found in service water pump A exist and the critical failure point is reached, the B service water pump would most likely fail quickly and not slowly degrade over time. However, not having the ability to inspect the pump without destroying it in the process, combined with the fact that the pump remained operable, management made a decision to operate the plant while procuring replacement parts that would allow a complete refurbishment or replacement of this pump in the near term. The pump was secured for maintenance on December 12, 2005. Immediately prior to securing the pump, operations ran the pump continuously for 24 hours.

The inspector considered this position to be adequate.

Concern 3 -

There is no confidence in the ability to meet safety function; it seems several GDC's requiring redundancy to accommodate a single failure (34, 38, and 44) is being violated by the current plant operation.

Conclusion -

The inspector did not substantiate the concern. No objective evidence was presented to support a conclusion that the B service water pump was inoperable.

The premise of this concern was that the B service water pump was inoperable. The licensee clearly stated in their response that should exactly similar conditions as was found in service water pump A exist and the critical failure point is reached, the B service water pump would most likely fail quickly and not slowly degrade over time. However, not having the ability to inspect the pump without destroying it in the process, combined with the fact that the pump remained operable, management made a decision to operate the plant while procuring replacement parts that would allow a complete refurbishment or replacement of this pump in the near term. The pump was secured for maintenance on December 12, 2005. Immediately prior to securing the pump, operations ran the pump continuously for 24 hours.

The inspector considered this position to be adequate.

Concern 4 -

It is perceived by staff that management's request for assessing extent of condition was a request for them to provide reasons why SW-P-1B was operable and would fulfill its design function. The staff felt the request emphasized the desired or an acceptable outcome.

Conclusion -

The inspector substantiated this concern only because it is stated as a perception of the staff. The inspector considered licensee management's communication to the staff concerning this situation to have been inadequate to avoid this perception.

The licensee stated in their response that management understood the extent of condition identified in SPER 205-0417 (Root Cause Analysis Report for SW-P-1A) as it relates to SW-P-1B. They also agreed with the finding and its basis that should exactly similar conditions exist and critical failure point be reached the pump would most probably fail quickly and not slowly degrade over time. Licensee management considered the B service water pump to be operable based on all Technical Specification and In-Service Testing requirements being met. Also, during this evaluation there was confusion between the evaluation team and management as to the exact roles and responsibilities of the evaluation team members. The team's assumption was that they were to provide a basis for restarting the plant. This resulted from the fact that management had not properly communicated to the team members their roles and responsibilities in the decision-making process set forth in procedure PPM 1.3.67, Effective Decision-Making.

The inspector considered management's position to be plausible but concluded that they did not adequately communicate with staff members. This lack of adequate communication resulted in a perception that a specific outcome was desired.

Concern 5 -

The staff is uneasy that management's request for assessing extent of condition emphasized the desired outcome and continued to mull over its Nuclear Safety implications. They also expressed apprehension over formally raising this issue under the Nuclear Safety Issues Program for fear of retribution.

Conclusion -

The inspector substantiated this concern although the term "staff" is used in a general way. There is reason to believe that some members of the licensee staff were uneasy with the situation concerning the B service water pump. Some members of the licensee staff did express apprehension over formally raising this issue under the Nuclear Safety Issues Program.

The licensee conducted interviews of eight individuals during the initial NSIP investigation to specifically ask if there was apprehension over raising a nuclear safety concern under the NSIP for fear of retribution, retaliation, or harassment. Two of the eight individuals responded that they were experiencing some apprehension about taking a stand or position on the operability of the B service water pump that was different from the perceived management position. The other six individuals had no concerns in this regard. The NSIP Manager reviewed the NSIP program with the two concerned individuals. Following the review, the NSIP Manager asked the two individuals if they wished to raise a concern specific to their apprehension and relative to harassment, intimidation, or retribution (chilling effect). They both responded that they would "think it over." Neither one of these individuals has raised this issue to the NSIP staff as of the date of the response to these allegation (December 20, 2005). In addition, the licensee provided the opportunity for all concerned individuals to review the NSIP report and provide personnel feedback to the NSIP Manager. Also,

the NSIP Manager initiated an electronic survey asking several questions related to their satisfaction with the NSIP program relative to this issue. The licensee reported that all but one of the individuals felt that the concern was fairly evaluated and that they would use the NSIP program again, even though there remained some disagreement with the report findings and recommendations.

The inspector considered the licensee's actions in this regard to have been reasonable. Some apprehension and disagreement was confirmed to exist.

Concern 6 -

The staff involved in assessing the extent of condition for SW-P-1A shaft failure expressed concern over timeliness of corrective actions for inspection, repair, or replacement of SWP-1B, and indicated they have since been approached to support extending this action.

Conclusion -

The inspector substantiated this concern in that there was a question of timeliness of corrective action for inspection, repair, or replacement of the B service water pump. Licensee management opted for a complete refurbishment or replacement of the pump versus an inspection to determine the condition of the pump shafts. The inspector could not determine if the staff had been approached to support extending this action but would not consider this to be problematic in and of itself.

The licensee procured new shaft couplings and had them available by September 2005. However, without new shafts available, these couplings would only provide a contingency repair should the existing couplings fail allowing the shafts to separate. Another contingency plan was developed which involved a design change to create a modified coupling. Management did not consider either of these contingencies preferable to procuring all of the parts necessary to perform a complete refurbishment or replacement, including new shafts, impeller, and refurbished pump bowl. This decision resulted in the schedule change to mid-December 2005. In reaching this decision, management wanted to ensure that the end result would be a completely refurbished standby service water pump.

The inspector agreed that the complete refurbishment or replacement option was appropriate for the long term. However, the shorter term considerations were not handled effectively since the basis for this decision was not communicated to the staff effectively.

Concern 7 -

The decision recommendation in the final signed Decision Resolution for SW-P-1B, dated June 21, 2005, and differs from that provided by the Decision Team. The key difference is the final recommendation. The Decision Team's recommendation was to postpone startup until SW-P-1B could be inspected and repaired.

Conclusion -

The inspector did substantiate the concern. The licensee determined that an error had been made when the Decision Resolution form was revised to support the decision to startup the plant but the names of the team members that did not support this decision were not removed, making it appear that these individuals supported the decision.

The licensee's response included a discussion of the operational decision making process as described in Administrative Procedure 1.3.67, "Effective Operational Decision Making," Revision 1. This procedure

specifies that the ultimate responsibility concerning disposition does not rest with the Decision Team. The Decision Maker is to review the options presented, determine which option to adopt, and present the options and recommendations to the Decision Approver. The licensee did identify and correct an error involving revision to the Decision Resolution form that was revised to reflect the ultimate decision to restart the plant. The names of the Decision Team members which had not recommended plant restart did remain on the form when they should have been removed. This error was entered into the licensee's corrective action program as Condition Report 2-05-05971.

The inspector considered this action to be adequate to address this issue.

Concern 8 -

The Decision Resolution does not identify or discuss the safest option of remaining shutdown until: (a) obtain replacement pump and/or parts for SW-P-1B (expedited); (b) prepare appropriate plans for inspection, repairs, or replacement; and (c) perform inspection, repair, or replacement and confirm successful outcome. The final signed Decision Resolution rejects the option of remaining shutdown because it presumes the repairs would occur immediately and if the parts were not available, the time with SW-P-1B out of service would be extended. These actions were not addressed.

Conclusion -

The inspector did substantiate the concern. The Decision Resolution did not identify or discuss the option of remaining shutdown. However, the licensee makes the case that the option of remaining shutdown is inherent in the process and could be characterized as the safest option whenever operability of safety-related equipment was in question. In this case, the B service water pump was considered operable.

The licensee's response to this concern discusses Energy Northwest's decision process procedure PPM 1.3.67, which speaks to options but does not dictate specific options be considered. Remaining shut down is always an available option when a question of operbility is presented. However, in this case, the service water pump B was considered to be operable. With regard to the determination and timeliness of the corrective actions, the licensee recognized that the B service water pump was susceptible to the same failure mechanism as the A service water pump. At the time, parts were not available to perform even a limited overhaul and replacement of the pump shaft and shaft couplings. The shaft couplings would be physically destroyed to allow for removal of the shaft for inspection. Also, the entire assembly is shrouded by an outer casing which does not allow access for remote inspection. Licensee management decided to procure replacement parts to allow a complete overhaul and replacement of the B service water pump as soon as parts were available. This was completed on December 15, 2005.

The inspector considered these arguments to be reasonable.

Concern 9 -

The Decision Resolution does not identify any assumptions although the governing procedure clearly calls for identifying and validating the critical assumption for the solution options. One key assumption for the recommended solution is that SW-P-1B will not fail prior to fulfilling its mission time in the event of a DBA. This undocumented assumption appears to be based on the fact that SW-P-1B passes its current surveillance. This undocumented assumption is not validated and appears suspect given the susceptibility to the same failure mechanism as SW-P-1A.

Conclusion -

The inspector did substantiate the concern. The Decision Resolution did not identify critical assumptions for all identified options. However, the service water pump B was considered operable and capable of fulfilling its design requirements. Therefore, documenting the critical assumptions may not have been required.

The licensee's response stated that the Design Resolution did not identify critical assumptions for all identified solution sets. The basis for this decision was that service water pump B had not been identified as being in a degraded or non-conforming condition and remained operable. The information available to management at the time of the decision to restart the plant indicated that service water pump B was operable and capable of fulfilling its design requirements as required.

The inspector agreed with this line of reasoning.

Concern 10 -

The Decision Recommendation appears contrary to guidance from NRC GL 91-18 regarding prompt corrective action to rework under the Corrective Action Program. Since the SW-P-1B condition is not specifically entered into the corrective action program under its own CR, it's NRC GL 91-18 and Corrective Action Program considerations might be lacking.

Conclusion -

The inspector did not substantiate this concern. The service water pump B was considered operable and not degraded or non-conforming. Therefore, Generic Letter 91-18 did not require prompt corrective action to rework under the Corrective Action Program. A Condition Report was initiated on July 22, 2005, about a month after plant restart. This Condition Report should have been initiated immediately after the receipt of the failure analysis for service water pump A. This part of the concern has merit.

The applicable Energy Northwest's procedure (PPM 1.3.66) uses language drawn from NRC Generic Letter 91-18 concerning operable but degraded or non-conforming equipment. Service water pump B was considered operable and not degraded or non-conforming. Management began the process of procuring parts to perform an inspection and replacement of the pump when it was confirmed that it was susceptible to the same failure mechanism as service water pump A.

The inspector considered this distinction to be reasonable.

Concern 11 -

The Reportability of the event and circumstances resulting from the SW-P-1A shaft failure and the implications for SW-P-1B is questionable. Staff expressed lingering doubts as to whether this should be reported in an LER.

Conclusion -

The inspector did not substantiate this concern. The question of reportability was reviewed with regard to the A service water pump at the time of failure. The reportability of the B service water pump issues have also been reviewed. At this time, no Licensee Event Reports appear to be required.

The licensee stated that the allegation does not specify why the reportability determinations were questionable or what lingering doubts were associated with this statement. Reportability of these concerns has been considered on several occasions in response to Condition Reports submitted on service water pump B. In addition, the management of the department responsible for preparation of event reports indicated that they had not been challenged on the reportability decisions.

The inspector concluded that, with regard to reportability, there were no issues stemming from service water pumps A or B.

Concern 12 -

The condition of SW-P-1B should be identified in its own Condition Report in order to ensure that it receives full process considerations of the Corrective Action Program (and not merely through the extent of condition of the Condition Report for SW-P-1A).

Conclusion -

The inspector did not substantiate this concern. A Condition Report (2-05-05983) was generated on July 22, 2005. This was about a month after plant restart. This Condition Report should have been written as soon as the failure analysis for service water pump A was received. The inspector considered this delay to be unacceptable but it does not support the concern as written.

The licensee stated in the response that the Condition Report written on July 22, 2005 was written approximately a month after restart. The licensee concluded that this Condition Report should have been initiated immediately, following receipt of the failure analysis for service water pump A.

The inspector agreed with this statement.