

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

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

SUBJECT: RESULTS OF FOLLOWUP INSPECTION ACTIVITIES OF ALLEGATION RIV-2005-A-0130, CONCERNS 1 THROUGH 5, 7 THROUGH 10, AND 12

This memorandum provides supplemental closure information for specific concerns associated with Columbia Generating Station Allegation RIV-2005-A-0130. On April 27, 2006, NRC Region IV completed a focused inspection at the Columbia Generating Station which included inspection of specific allegation concerns. The purpose of this inspection effort was to independently assess the licensee's response to these concerns that was originally used as the basis for closure of the allegation.

The results of this inspection effort is documented in a separate inspection report (05000397/2006011). In addition to the allegation concerns specified in the inspection plan, the inspection focused on the station's testing and preventive maintenance programs, the decision making process used by the licensee associated with the service water pump issues, the operability determination process, the corrective action program, and the status of other station components.

Allegation RIV-2005-A-0130, concerns 1 through 5, 7 through 10, and 12 were inspected as part the focused inspection effort described above. Of these, all the concerns except concerns 2, 4, 5, 8, 10, and 12 remained as dispositioned in the original closure memo for this allegation. The inspection confirmed that these concerns were adequately characterized using the licensee's response as a basis.

Allegation RIV-2005-A-0130, concern 2 was originally not substantiated. The inspection team determined that this concern was substantiated.

Allegation RIV-2005-A-0130, concern 4 was originally substantiated. The inspection team determined that this concern was not substantiated.

Allegation RIV-2005-A-0130, concern 5 was originally substantiated. The inspection team determined that this concern was not substantiated.

Allegation RIV-2005-A-0130, concern 8 was originally substantiated. The inspection team determined that this concern was not substantiated.

Allegation RIV-2005-A-0130, concern 10 was originally not substantiated. The inspection team determined that this concern was substantiated.

Allegation RIV-2005-A-0130, concern 12 was originally not substantiated. The inspection team determined that this concern was substantiated.

The description below identifies the differences between the original assessment and the inspection team assessment and provides final closure for these specific concerns.

With regard to the response provided to the Governor of the State of Washington concerning some of the concerns associated with allegation RIV-2005-A-0130, the results of the focused inspection does not change our overall assessment as specified in this response. No additional communication with the Governors office is required as a result of this effort.

cl/4

## Inspector Followup to Allegation RIV-2005-A-0130 Concerns 2, 4, 5, 8, 10, and 12

**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.

On April 27, 2006, the NRC completed an independent inspection of selected concerns associated with this allegation. This was done to supplement the original direction from the Allegation Review Board to refer these concerns to the licensee. The results of this inspection effort were generally consistent with the original assessment of the concerns as described in the memorandum used to close this allegation. However, there were several concerns that were characterized differently from the original assessment based upon the inspection results. These concerns were reassessed as follows:

### **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.**

### **Initial Conclusion Based on Licensee Investigation and Response -**

**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 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.

**Revised Conclusion Based on Subsequent Inspection -**

**The inspection team substantiated this concern.**

The inspection team provided the following statement regarding this concern:

Operability assurance could not be determined without inspection of the SW-P-1B couplings to determine if the pump shaft had been affected similarly to SW-P-1A. However, a reasonable expectation of operability could be concluded given that SW-P-1B performance had not started to rapidly degrade and was continuing to meet its TS required surveillance acceptance criteria. IST surveillance testing alone could not detect the approach to failure of the SW pumps for the degradation which occurred. However, IST testing in general and condition monitoring is a useful tool which can indicate the onset of other component degradations and could identify an approach to failure for other failure mechanisms. This failure mechanism (shaft degradation) highlights the importance of periodic inspection in concert with condition monitoring to ensure the operational readiness of plant systems.

The inspector that performed the original assessment of this concern reviewed the inspection team results to determine the specific differences between the two assessments. The concern uses the term "assurance" to describe the operability standard to which the alleege believes is necessary to be shown. However, as the inspection team points out, a "reasonable expectation of operability" is the standard that was required in this case. Given the information that was available at the time, a reasonable expectation of operability of service water pump B could be concluded based on testing and performance data. This is consistent with the original conclusion. However, the inspection team states that operability assurance could not be determined without inspection of the pump. No significant additional data was provided during the inspection effort.

The licensee's response to this referred concern was considered adequate.

**Based on the focused inspection effort, this concern is substantiated.**

**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.**

**Initial Conclusion Based on Licensee Investigation and Response -**

**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.

#### **Revised Conclusion Based on Subsequent Inspection -**

#### **The inspection team did not substantiate this concern.**

The inspection team provided the following statement regarding this concern:

Several individuals (three decision team members, the system engineer, and Vice-President) were interviewed that were involved with the restart decision and operability assessment of the B pump. Of this group, only one individual felt management was looking for the "right answer". In fact, the VP did delay the start up an additional day to further consider and discuss the options that were available at that point in time.

The inspector that performed the original assessment of this concern reviewed the inspection team results to determine the specific differences between the two assessments. The original assessment was based upon the actual wording of the concern. Specifically, the use of the word "perceived". The inspection team approached this issue from a slightly different point of view in that they attempted to determine if such a perception was widespread at the station. Based on the interviews conducted, only one individual held this perception. Therefore, the inspection team concluded that the staff did not, in general, perceive that management was requesting a specific outcome. No significant additional data was provided during the inspection effort.

The licensee's response to this referred concern was considered adequate.

**Based on the focused inspection effort, this concern is not substantiated.**

#### **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.**

### **Initial Conclusion Based on Licensee Investigation and Response -**

**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.

### **Revised Conclusion Based on Subsequent Inspection -**

**The inspection team did not substantiate this concern.**

The inspection team provided the following statement regarding this concern:

Most interviews conducted included questions on raising nuclear safety concerns. None of the individuals were able to provide any examples of an individual being “punished” for raising a safety concern or disagreeing with management on a safety issue. One individual did express a concern on what could happen in the future. No interviewees expressed any concerns with raising safety issues to NSIP.

The inspector that performed the original assessment of this concern reviewed the inspection team results to determine the specific differences between the two assessments. The original assessment focused on the stated position of the allegor as described in the concern similar to concern 4 above. In this case, the original assessment was based on the allegor’s statement that the staff was uneasy and apprehensive about this situation. The inspection team focused on attempting to determine if these opinions were widely held at the station. Based on the interviews conducted, the inspection team determined that these views were not broad based and therefore considered the concern not substantiated. No significant additional data was provided during the inspection effort.

The licensee’s response to this referred concern was considered adequate.

**Based on the focused inspection effort, this concern is not substantiated.**

#### **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.

#### **Initial Conclusion Based on Licensee Investigation and Response -**

The inspector substantiated this 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 operability 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.

#### **Revised Conclusion Based on Subsequent Inspection -**

**The inspection team did not substantiate this concern.**

The inspection team provided the following statement regarding this concern:

The decision resolution was not framed as a "restart" decision. It was narrowly focused as a decision on when to inspect SW-P-1B. An option for keeping the plant shutdown was not appropriate to the issue being decided. The decision reached was to inspect the pump as soon as parts were available to repair/replace the pump. It could not be inspected without causing it to become inoperable, and at least some specialized parts were needed to put it back in running order once it was disassembled for inspection. Additionally, the final decision resolution did discuss the option of remaining shutdown until such time that SW-P-1B could be inspected, although in the end this option was not approved.

The inspector that performed the original assessment of this concern reviewed the inspection team results to determine the specific differences between the two assessments. The original assessment was done on the assumption that the decision resolution was a restart decision process. The licensee's response to this referred concern did not clearly state that it was viewed by station management as a process to determine when to inspect the B service water pump whereas the technical staff viewed this process as a restart decision. This is primarily where the difference is. The inspection team made their determination based on how the decision resolution was used by station management and not how it was viewed by the technical staff. No significant additional data was provided during the inspection effort.

The licensee's response to this referred concern was considered adequate.

**Based on the focused inspection effort, this concern is not substantiated.**

#### **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.**

#### **Initial Conclusion Based on Licensee Investigation and Response -**

**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.

#### **Revised Conclusion Based on Subsequent Inspection -**

**The inspection team substantiated this concern.**

The inspection team provided the following statement regarding this concern:

The decision resolution process does not reflect the GL 91-18 guidance or RIS 2-5-020 by design. It is not designed as an operability evaluation process but to address other decision making processes, which in this case was used to address when was the appropriate time to inspect SW-P-1B and not for addressing operability. Additionally, the condition of SW-P-1B should have been entered in to the station CR process and therefore would have received an adequate operability evaluation consistent with GL 91-18 guidance.

The inspector that performed the original assessment of this concern reviewed the inspection team results to determine the specific differences between the two assessments. This concern is related to concern 8 above. The difference between the original assessment and that of the inspection team is due to the way the decision resolution was used by the licensee in this case. Since the decision resolution was not used as an operability evaluation, it did not reflect the requirements of GL 91-18 and the final decision recommendation also did not reflect this guidance. In the original assessment, the B service water pump was considered operable. As a result, no operability evaluation was required and the decision recommendation was consistent with this assumption. The decision resolution process was not related to pump operability. With regard to the corrective action program, both the inspection team and the original assessment acknowledged that a condition report for the B service water pump should have been generated as part of the extent of condition evaluation for the failed A service water pump. No significant additional data was provided during the inspection effort.

The licensee's response to this referred concern was considered adequate.

**Based on the focused inspection effort, this concern is substantiated.**

#### **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).**

#### **Initial Conclusion Based on Licensee Investigation and Response -**

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.

#### **Revised Conclusion Based on Subsequent Inspection -**

**The inspection team substantiated this concern.**

The inspection team provided the following statement regarding this concern:

Given that the service pump 1B condition was essentially indeterminate, a CR should have been written to address operability of the pump so that it could be fully assessed under the requirements of the corrective action program.

The inspector that performed the original assessment of this concern reviewed the inspection team results to determine the specific differences between the two assessments. The difference between these two assessments is one of timing. The original assessment acknowledged that a separate condition report should have been written at the time the A service pump failure analysis was received. Instead, a condition report was written approximately one month later. The concern as written does not

specify any time considerations. The original assessment used a literal interpretation. The inspection team considered how the corrective action program was utilized by the licensee for this condition. They concluded that it was not used appropriately for service water pump B in that a condition report was not generated in a timely manner. No significant additional data was provided during the inspection effort.

The licensee's response to this referred concern was considered adequate.

**Based on the focused inspection effort, this concern is substantiated.**